Riverside Basin Groundwater Management Plan

October 2012

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PUBLIC UTILITIES

Riverside Basin
Groundwater Management Plan

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TABLE OF CONTENTS

TABLE OF CONTENTS ..... **I**

LIST OF TABLES ..... **III**

LIST OF FIGURES ..... **V**

ACRONYMS AND ABBREVIATIONS ..... **IX**

1 INTRODUCTION AND BACKGROUND **1-1**

1.1 Purpose of the Groundwater Management Plan 1-1
1.2 Description of the Groundwater Basin and Plan Area 1-1
1.3 Groundwater Model 1-5
1.4 Overview of Water Requirements and Supplies 1-5
1.5 Legislation Related to Groundwater Management Plans 1-8
1.6 Prior and Current Water Management Planning Efforts 1-10
1.7 Public Process in Developing the Groundwater Management Plan 1-21
1.8 Advisory Committee 1-26
1.9 Riverside Basin GWMP and Consistency with California Water Code 1-26

2 WATER RESOURCES CONDITIONS **2-1**

2.1 Climate 2-1
2.2 Surface Water 2-4
2.3 Groundwater 2-5
2.4 Imported Water 2-30
2.5 Recycled Water 2-30

3 WATER REQUIREMENTS AND SUPPLIES **3-1**

3.1 Current and Historical Water Requirements and Supplies 3-1
3.2 Projected Water Requirements and Supplies 3-28

4 GROUNDWATER PRODUCTION AND THE 1969 WESTERN JUDGMENT **4-1**

4.1 Historical Production 4-1
4.2 Projected Production 4-11

5 OPERATIONAL YIELD 5-1

5.1 Background 5-1

5.2 Development 5-1

5.3 Implementation 5-9

6 GOAL AND OBJECTIVES FOR THE BASIN 6-1

6.1 Riverside Basin Goal 6-1

6.2 Components of Basin Management Objectives 6-1

6.3 Basin Management Objectives 6-3

7 ELEMENTS OF THE GROUNDWATER MANAGEMENT PLAN 7-1

7.1 Groundwater Volume 7-4

7.2 Groundwater Quality 7-5

7.3 Monitoring and Management 7-12

7.4 Coordinated Planning 7-17

8 IMPLEMENTATION 8-1

8.1 Potential Projects 8-2

8.2 Governance 8-18

8.3 Dispute Resolution 8-19

8.4 Financing 8-19

8.5 Schedule 8-20

9 CONCLUSIONS 9-1

10 REFERENCES 10-1

APPENDIX A – RESOLUTIONS AND PUBLIC HEARING ADVERTISEMENTS

APPENDIX B – GEOLOGIC CROSS-SECTIONS

APPENDIX C – CONSUMER CONFIDENCE REPORTS

APPENDIX D – MONITORING PROTOCOLS

LIST OF TABLES

Table 1.1 Advisory Committee....1-26
Table 1.2 Riverside Basin GWMP Components....1-27
Table 2.1 Average Monthly Temperature and Reference Evapotranspiration 2-1
Table 2.2 Location and Data Availability of Selected USGS Stream Gages....2-4
Table 2.3 Characteristics of Hydrologic Soil Groups 2-7
Table 2.4 Historical (1954-1973), 1997 Current (1978-1997), 2003 Current (1984-2003), 2006 Current (1987-2006), and 2009 Current (1990-2009) Ambient Nitrate as N and TDS Concentrations (mg/L)....2-18
Table 2.5 Change in Ambient Concentration (mg/L) of Nitrate as N and TDS Between Historical (1954-1973) and 2009 Current (1990-2009) Time Periods 2-19
Table 2.6 TCE and PCE Concentrations in Downtown Well Cluster 2-22
Table 3.1 Summary of Current Water Supply Sources 3-3
Table 3.2 Annual Riverside Basin Groundwater Production by Agency (AF) 3-25
Table 3.3 Annual Riverside North Groundwater Production by Agency (AF) 3-26
Table 3.4 Annual Riverside South Groundwater Production by Agency (AF)....3-27
Table 3.5 Current and Projected Riverside Basin Groundwater Production by Entity in the Riverside Basin (AFY) 3-29
Table 3.6 Colton Current and Projected Riverside Basin Groundwater Supplies (AFY)....3-34
Table 3.7 Jurupa Current and Projected Riverside Basin Groundwater Supplies (AFY) 3-35
Table 3.8 RPU Current and Projected Riverside Basin Groundwater Supplies (AFY) 3-37
Table 3.9 Riverside Highland Current and Projected Riverside Basin Groundwater Supplies (AFY)....3-38
Table 3.10 Rubidoux Current and Projected Riverside Basin Groundwater Supplies (AFY) 3-39
Table 3.11 West Valley Current and Projected Riverside Basin Groundwater Supplies (AFY) 3-41
Table 4.1 Base Period Extractions from Riverside North by Riverside County Entities for use in San Bernardino County, by Entity (AF) 4-4
Table 4.2 Base Period Extractions from Riverside North by Riverside County Entities for use in Riverside County, by Entity (AF)....4-5
Table 4.3 Base Period Extractions from Riverside South, by Entity (AF)....4-9

Table 4.4 Current and Projected Riverside North Groundwater Supplies for Use in Riverside County (AFY) 4-13
Table 4.5 Projected Total Riverside North Groundwater Supplies (AFY) 4-13
Table 4.6 Current and Projected Riverside South Groundwater Supplies (AFY) 4-15
Table 4.7 Projected Total Riverside South Groundwater Supplies (AF) 4-16
Table 5.1 Annual Groundwater Budget for Riverside Basin and Associated Operational Yield 5-5
Table 5.2 Riverside Basin Conditions and Potential Operational Responses 5-9
Table 6.1 Groundwater Quality BMO Triggers 6-7
Table 7.1 Summary of GWMP Objectives and Elements 7-3
Table 8.1 Simulated Basin Conditions 8-6
Table 8.2 Simulations Compared to Historical and Projected Production, Riverside North (AFY) 8-11
Table 8.3 Simulated Riverside North Groundwater Production by Riverside County Entities for Use in Riverside County Compared to Base Rights (AFY) 8-13
Table 8.4 Simulations Compared to Historical and Projected Production, Riverside South (AFY) 8-15
Table 8.5 Simulated Riverside South Groundwater Production Compared to Base Rights (AFY) 8-17

LIST OF FIGURES

Figure 1.1 Plan Area....1-2
Figure 1.2 Municipalities....1-3
Figure 1.3 Water Agencies....1-4
Figure 1.4 Land Use Summary, 2005....1-6
Figure 1.5 Land Use, 2005....1-7
Figure 1.6 Groundwater Production by Producer, 2009....1-8
Figure 1.7 Areas with Groundwater Management Plans....1-9
Figure 1.8 Management Zones....1-16
Figure 2.1 Precipitation and Streamflow Stations....2-2
Figure 2.2 Historical Annual Precipitation and Cumulative Departure from Mean Precipitation....2-3
Figure 2.3 Average Monthly Precipitation....2-4
Figure 2.4 Hydrologic Soil Groups....2-8
Figure 2.5 Fall 2009 Groundwater Elevations....2-10
Figure 2.6 Comparison of Recent and Historical Groundwater Elevations....2-11
Figure 2.7 Hydrograph Locations....2-12
Figure 2.8 Hydrographs at Selected Wells....2-13
Figure 2.9 Management Zone Water Quality Conditions – Nitrate as Nitrogen....2-20
Figure 2.10 Management Zone Water Quality Conditions – Total Dissolved Solids....2-21
Figure 3.1 Average Monthly Distribution of Annual Demand....3-2
Figure 3.2 RIX Facility Historical Annual Overextraction from the Riverside Basin....3-6
Figure 3.3 Colton Current Water Supply Sources....3-7
Figure 3.4 Colton Historical Annual Riverside Basin Groundwater Production....3-8
Figure 3.5 Empire Historical Annual Riverside Basin Groundwater Production....3-9
Figure 3.6 Jurupa Current Water Supply Sources....3-10
Figure 3.7 Jurupa Historical Annual Riverside Basin Groundwater Production....3-11
Figure 3.8 Meeks & Daley Historical Annual Riverside Basin Groundwater Production....3-12
Figure 3.9 RPU 2009 Water Supply Sources....3-13
Figure 3.10 RPU Historical Annual Riverside Basin Groundwater Production....3-14

Figure 3.11 Riverside Highland Current Water Supply Sources 3-15
Figure 3.12 Riverside Highland Historical Annual Riverside Basin Groundwater Production 3-16
Figure 3.13 Rubidoux Historical Annual Riverside Basin Groundwater Production 3-17
Figure 3.14 West Valley Current Water Supply Sources 3-18
Figure 3.15 West Valley Historical Annual Riverside Basin Groundwater Production 3-19
Figure 3.16 Other Groundwater Producers Combined Historical Annual Riverside Basin Groundwater Production.....3-20
Figure 3.17 Private Groundwater Producers Historical Annual Riverside Basin Groundwater Production.....3-22
Figure 3.18 Riverside Basin Stakeholders Current Water Supply Sources 3-23
Figure 3.19 Groundwater Production by Agency, 2009 3-23
Figure 3.20 Groundwater Production, Average for 2005 - 2009 3-24
Figure 3.21 Historical Annual Riverside North and South Groundwater Production 3-28
Figure 3.22 Current and Projected Water Supplies for Retail Water Agencies that Serve the Riverside Basin and for Riverside Basin Private Users 3-31
Figure 3.23 Riverside Basin Historical and Projected Groundwater Supply 3-32
Figure 3.24 Riverside Basin Projected Water Supplies by Supply Type 3-32
Figure 3.25 Colton Projected Water Supply 3-33
Figure 3.26 Jurupa Projected Water Supply 3-35
Figure 3.27 RPU Projected Water Supply 3-36
Figure 3.28 Riverside Highland Projected Water Supply.....3-38
Figure 3.29 Rubidoux Projected Water Supply.....3-39
Figure 3.30 West Valley Projected Water Supply 3-40
Figure 4.1 Boundaries of Riverside North and Riverside South 4-2
Figure 4.2 Base Period Extractions from Riverside North by San Bernardino County Entities ..4-3
Figure 4.3 Base Period Extractions from Riverside North by Riverside County Entities for use in San Bernardino County, by Entity 4-4
Figure 4.4 Base Period Extractions from Riverside North by Riverside County Entities for use in Riverside County, by Entity.....4-5
Figure 4.5 Verified Extraction from Riverside North by San Bernardino County Entities 4-7

Figure 4.6 Verified Extraction from Riverside North by Riverside County Entities for Use in San Bernardino County 4-7
Figure 4.7 Verified Extraction from Riverside North by Riverside County Entities for Use in Riverside County 4-8
Figure 4.8 Base Period Extraction from Riverside South, by Entity 4-8
Figure 4.9 Verified Extraction from Riverside South by Riverside County Entities for Use in Riverside County 4-11
Figure 4.10 Historical and Projected Riverside North Extraction for Use within Riverside County 4-14
Figure 4.11 Historical and Projected Riverside South Extraction 4-16
Figure 5.1 Simulated Historical Basin Trends 5-7
Figure 5.2 Estimated Operational Yield 5-8
Figure 5.3 Operational Yield Estimation Based on the Total Inflow 5-11
Figure 6.1 Sub Areas 6-2
Figure 6.2 Groundwater Level BMO Wells 6-5
Figure 7.1 Interaction and Grouping of GWMP Elements 7-2
Figure 7.2 Existing Sources of Recharge 7-8
Figure 7.3 Wells Monitored for Water Levels 7-13
Figure 7.4 Wells Monitored for Water Quality 7-16
Figure 8.1 Average Simulated Groundwater Elevations for 1969 Western Judgment Index Wells (Flume 2, Flume 5, and Johnson 1) 8-14

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ACRONYMS AND ABBREVIATIONS

µg/L	micrograms per liter
3-D model	three-dimensional hydrostratigraphic model
5-Year Base Period Average	Average production over the 1959-1963 period, as defined in the 1969 Western Judgment
1969 Western Judgment	Judgment in *Western Municipal Water District of Riverside County et al., v East San Bernardino County Water District et al.*
AB	Assembly Bill
Advisory Committee	Riverside Basin Groundwater Management Plan Advisory Committee
AF	acre-feet
AFY	acre-feet per year
ASR	Aquifer Storage and Recovery
AWT	advanced wastewater treatment
Base Period	the 5-year period from 1959 through 1963 from which the average groundwater production was computed to develop extraction rights as stipulated in the 1969 Western Judgment
Base Rights	extraction rights stipulated within the 1969 Western Judgment
Basin Plan	Water Quality Control Plan for the Santa Ana Basin
BMO	basin management objective
Brine Line	Inland Empire Brine Line
CASGEM	California Statewide Groundwater Elevation Monitoring
Cr+3	trivalent chromium
Cr+6	hexavalent chromium
CUWCC	California Urban Water Conservation Council
DBCP	dibromochloropropane
DEH	Riverside County Department of Environmental Health
DEHS	San Bernardino County Department of Environmental Health Services

DPH	California Department of Public Health
DTSC	California Department of Toxic Substances Control
DWR	California Department of Water Resources
EC	Existing Conditions
EPA	United States Environmental Protection Agency
Empire	Empire Water Company
GAMA	Groundwater Ambient Monitoring Assessment
GPS	global positioning satellites
GWMP	Groundwater Management Plan
InSAR	interferometric synthetic aperture radar
IRP	Integrated Resources Plan
IRWMP	Integrated Regional Water Management Plan
JPA	joint powers agreement
Jurupa	Jurupa Community Services District
LUFT	leaking underground fuel tank
MCL	maximum contaminant level
Meeks & Daley	Meeks & Daley Water Company
Metropolitan	Metropolitan Water District of Southern California
MGD	million gallons per day
mg/L	milligrams per liter
MOU	memorandum of understanding
N	nitrogen
NPDES	National Pollutant Discharge Elimination System
OCWD	Orange County Water District
Orange County Judgment	Judgment in *Orange County Water District v City of Chino, et al.*
OWOW	Santa Ana Watershed Integrated Regional Water Management Plan (One Water One Watershed)
PAH	polycyclic aromatic hydrocarbons
PCBs	polychlorinated biphenyls

PCE	tetrachloroethylene
Plan Area	area covered by Riverside Basin Groundwater Management Plan
ppb	parts per billion
ppm	parts per million
PRP	potentially responsible party
RAGFM	Riverside-Arlington Groundwater Flow Model
RCFCWCD	Riverside County Flood Control and Water Conservation District
RIX	Rapid Infiltration and Extraction
Riverside Highland	Riverside Highland Water Company
RPU	Riverside Public Utilities
Rubidoux	Rubidoux Community Services District
RWQCB	Santa Ana Regional Water Quality Control Board
RWQTP	Regional Water Quality Treatment Plant
SABRINA	Santa Ana Basin Relational Information Network Application Database
SAIWP	Santa Ana Integrated Watershed Plan
SAWDMS	Santa Ana Watershed Data Management System
SAWPA	Santa Ana Watershed Project Authority
SB	Senate Bill
SBBA	San Bernardino Basin Area
SLIC	spills leaks investigation and cleanup
SMCL	secondary maximum contaminant level
SVOCs	semi-volatile organic compounds
SWP	State Water Project
SWRCB	California State Water Resources Control Board
TCE	trichloroethylene
TDS	total dissolved solids
Terrace	Terrace Water Company
TMDL	Total Maximum Daily Load

USGS	United States Geological Survey
UWMP	Urban Water Management Plan
Valley District	San Bernardino Valley Municipal Water District
VOCs	volatile organic compounds
Watermaster	Western-San Bernardino Watermaster
West Valley	West Valley Water District
Western	Western Municipal Water District

1 INTRODUCTION AND BACKGROUND

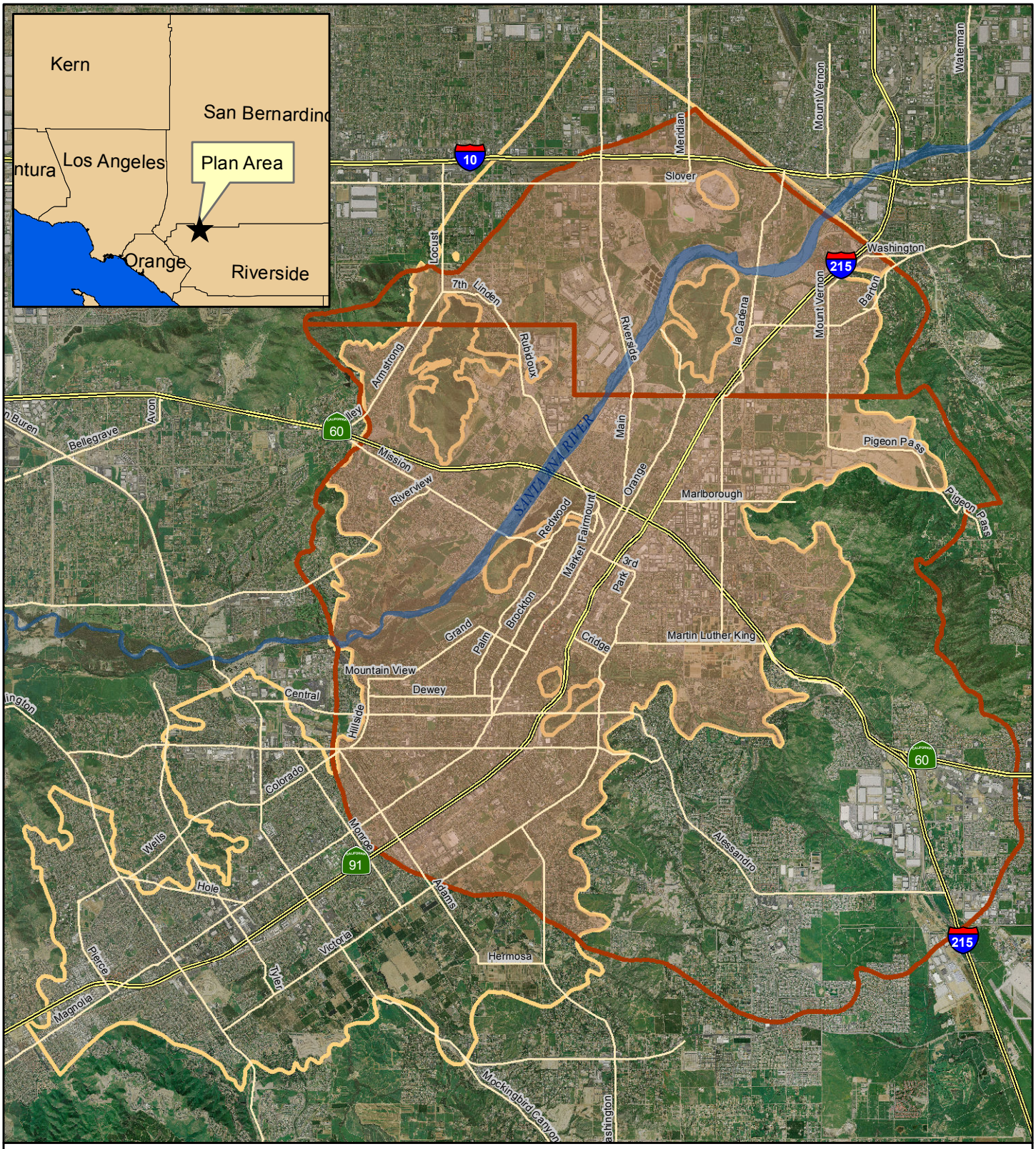
1.1 PURPOSE OF THE GROUNDWATER MANAGEMENT PLAN

The goal of the Riverside Basin Groundwater Management Plan (GWMP) is to provide a planning framework to operate and manage the groundwater basin in a sustainable manner to ensure a long-term reliable supply for beneficial uses among all stakeholders in the basin.

The purpose of this Riverside Basin GWMP, including the development of the plan and the plan document itself, is to inform the public of the importance of groundwater to the Riverside Basin and the challenges and opportunities it presents; develop consensus among stakeholders on issues and solutions related to groundwater; build relationships among stakeholders within the basin and between local, state, and federal agencies; and define actions for developing project and management programs to ensure the long-term sustainability of groundwater resources in the Riverside Basin. This GWMP provides action items that, when implemented, are intended to optimize groundwater levels, enhance water quality, and minimize land subsidence.

1.2 DESCRIPTION OF THE GROUNDWATER BASIN AND PLAN AREA

The Riverside Basin GWMP area (Plan Area) is the portion of the Riverside-Arlington Groundwater Subbasin (Subbasin Number 8.2-03), as defined by California Department of Water Resources' (DWR) Bulletin 118-03 (DWR, 2003), within the boundaries of the Riverside Basin (both North and South), as defined by *Western Municipal Water District of Riverside County et al. v East San Bernardino County Water District et al.,* Superior Court No. 78426 (1969) (1969 Western Judgment). The Plan Area is shown in Figure 1.1. The Plan Area boundaries as defined by Bulletin 118-03 (DWR, 2003) are used to identify the alluvial aquifer system and to be consistent with statewide planning efforts. The Plan Area boundary between the Arlington Basin and the Riverside Basin is defined by the 1969 Western Judgment and is used to maintain consistency with existing management structures defined in that document and in later planning efforts. The Plan Area includes portions of Riverside and San Bernardino counties. Overlying municipalities are shown in Figure 1.2 and include Riverside, Colton, and Grand Terrace and small portions of Rialto and Fontana. Water agencies serving areas overlying the Plan Area are shown in Figure 1.3 and include the City of Colton, Jurupa Community Services District (Jurupa), Riverside Highland Water Company (Riverside Highland), Riverside Public Utilities (RPU), Rubidoux Community Services District (Rubidoux), San Bernardino Valley Municipal Water District (Valley District), Terrace Water Company (Terrace), West Valley Water District (West Valley), and Western Municipal Water District (Western). Two private water companies, Meeks & Daley Water Company (Meeks & Daley) and Empire Water Company (Empire) also produce water from the Riverside Basin. Areas within the southern portion of the DWR-defined Riverside-Arlington Basin but outside of the 1969 Western Judgment-defined Riverside Basin are included in the Arlington Basin GWMP (WRIME, 2012).



Legend

- Plan Area
- DWR Basin
- Highways
- 1969 Western Judgment
- Roads

N W E S

0 0.5 1 2 Miles

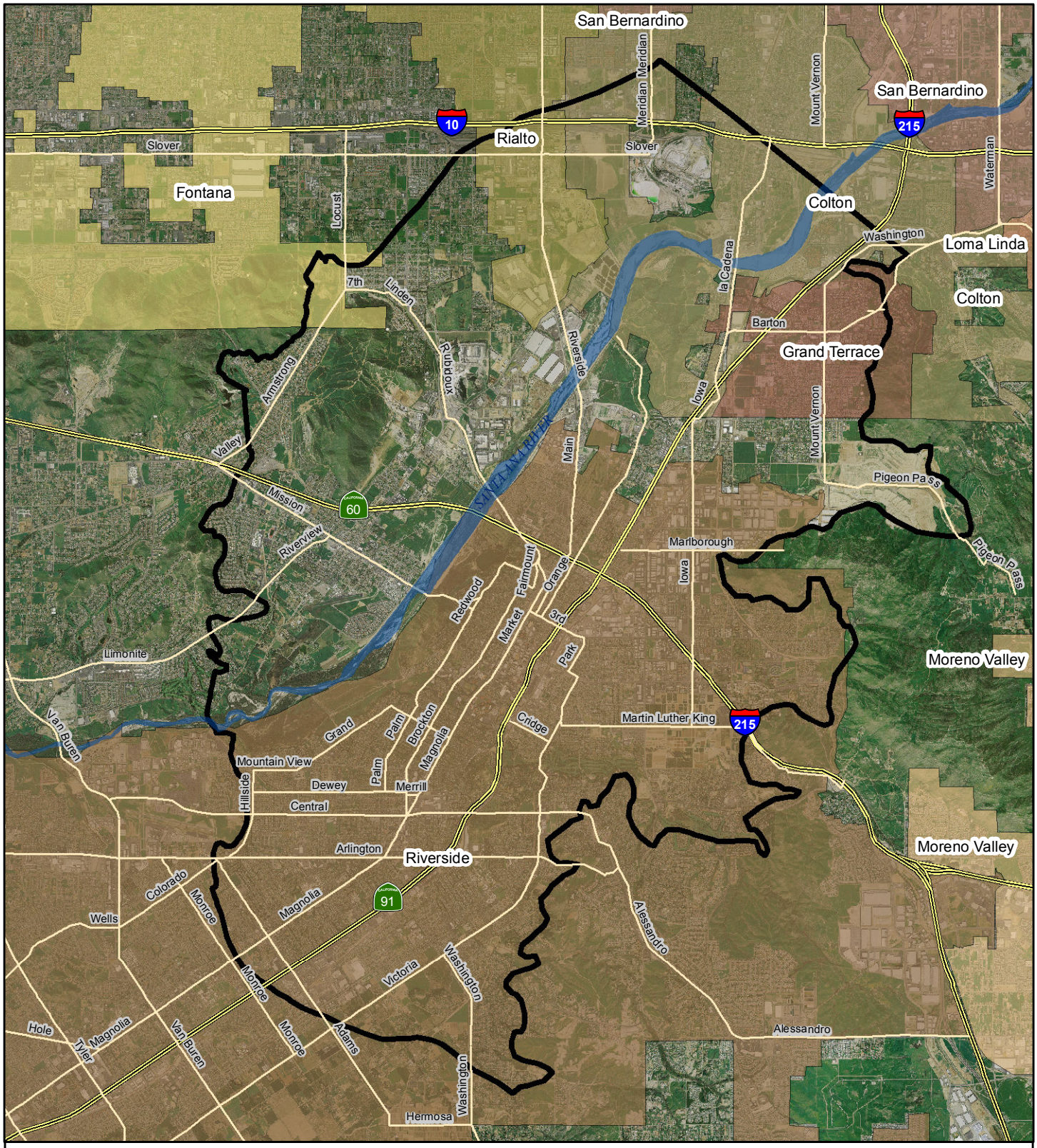
CITY OF RIVERSIDE

Plan Area

Riverside Basin Groundwater Management Plan

2011

Figure 1.1



Legend

- Plan Area
- Highways
- Roads

N
W E
S

0 0.5 1 2 Miles

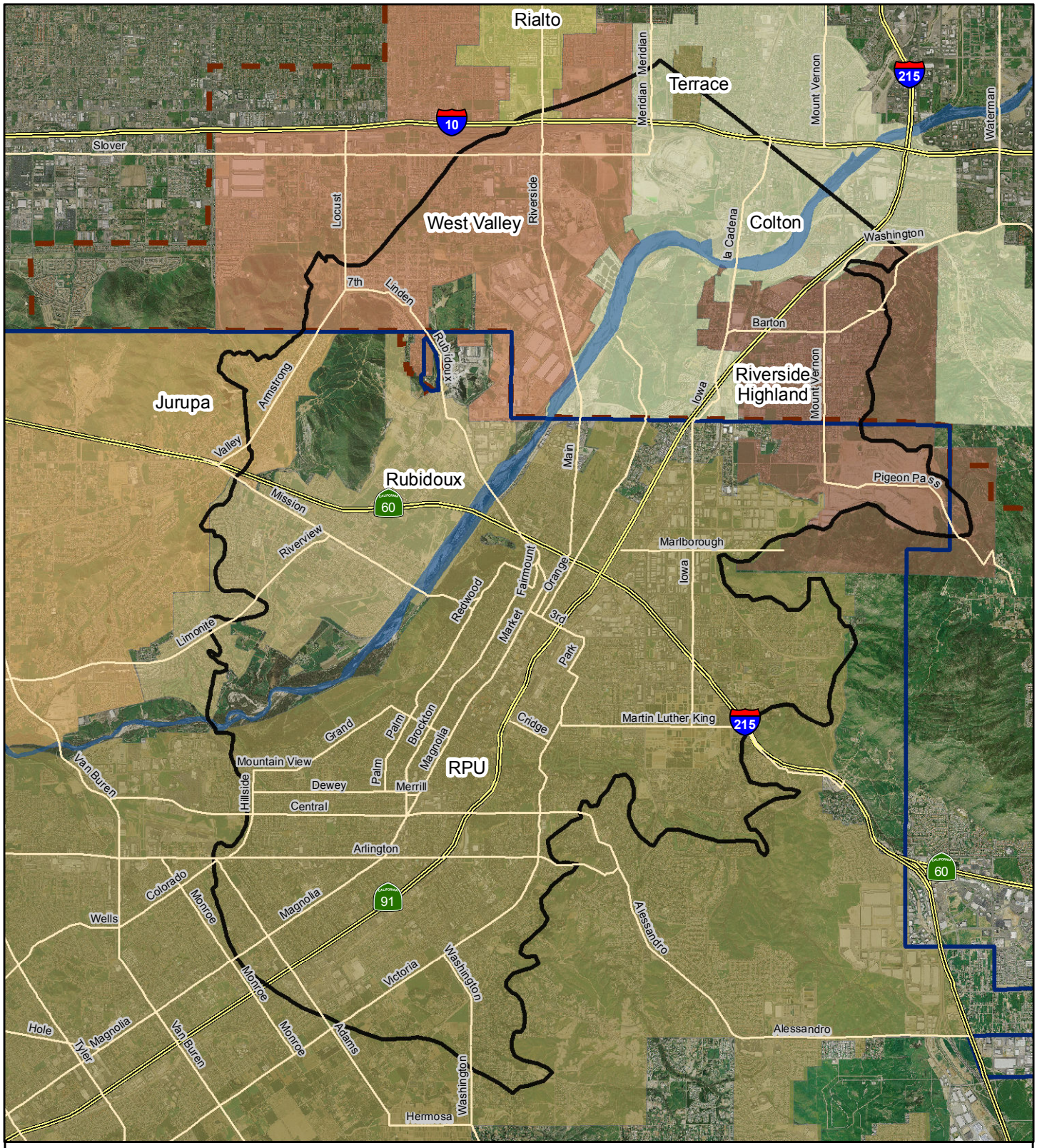
CITY OF RIVERSIDE

Municipalities

Riverside Basin Groundwater Management Plan

2011

Figure 1.2



Legend

- Plan Area
- Western
- Highways
- Valley District
- Roads

N W E S

0 0.5 1 2 Miles

CITY OF RIVERSIDE

Water Agencies

Riverside Basin Groundwater Management Plan

2011

Figure 1.3

1.3 GROUNDWATER MODEL

A groundwater model was developed to assist in the development of this GWMP and to guide future groundwater planning efforts. The Riverside-Arlington Groundwater Flow Model (RAGFM) is a saturated groundwater flow model using the United States Geological Survey (USGS) groundwater flow code MODFLOW-2000 (Harbaugh, 2000) and the pre- and post-processor program Groundwater Vistas Version 5 (Rumbaugh and Rumbaugh, 2007). The groundwater model is a tool for improving the understanding of the groundwater basins and the potential benefits and impacts of proposed water supply planning scenarios.

The RAGFM model area covers a total of 95.5 square miles, consisting of 23.2 square miles in the Arlington Basin, 65.3 square miles in the Riverside Basin, and 7 square miles in the Rialto-Colton Basin. This area is modeled with 3 layers with 182,700 cells per model layer, representing, from top to bottom:

1) Coarser alluvium and river deposits along the Santa Ana River
2) Shallower alluvium with higher conductivities
3) Deeper alluvium with lower conductivities

The model simulates hydrology for the 1965 to 2007 time period, which includes normal, wet, dry, and extended drought conditions. For comparison to proposed water supply planning scenarios, an Existing Conditions (EC) Baseline scenario was developed, representing 2007 land and water conditions, plus 8,200 acre-feet per year (AFY) of groundwater production by flume wells minus 1,900 AFY in Riverside South.

Based on the overarching goal of operating and managing the groundwater basin in a sustainable manner for reliable supply for beneficial uses, this GWMP develops Basin Management Objectives (BMOs) (Section 6.2) and Elements (Section 7) that provide targets and actions to meet that goal. The RAGFM is used to investigate future impacts and benefits of current and projected operations relative to the GWMP goal and BMOs and to investigate the ability of combinations of potential projects to move the basin closer to meeting the goal and BMOs. A description of this modeling effort is provided in Section 8.1.3 with additional detail in *Riverside-Arlington Groundwater Flow Model (RAGFM), Model Development and Scenarios* (WRIME, 2011).

1.4 OVERVIEW OF WATER REQUIREMENTS AND SUPPLIES

The Plan Area covers approximately 38,750 acres (approximately 61 square miles) and is extensively developed: approximately 67 percent urban, 21 percent undeveloped or vacant, 5 percent irrigated parks, and 7 percent irrigated agriculture (Southern California Association of Governments, 2005), as shown in Figure 1.4 and in Figure 1.5. Urban areas include large portions of the cities of Colton, Grand Terrace, and Riverside and very small portions of the

cities of Rialto and Fontana, as well as urbanized unincorporated areas. Agricultural use is predominantly citrus groves.

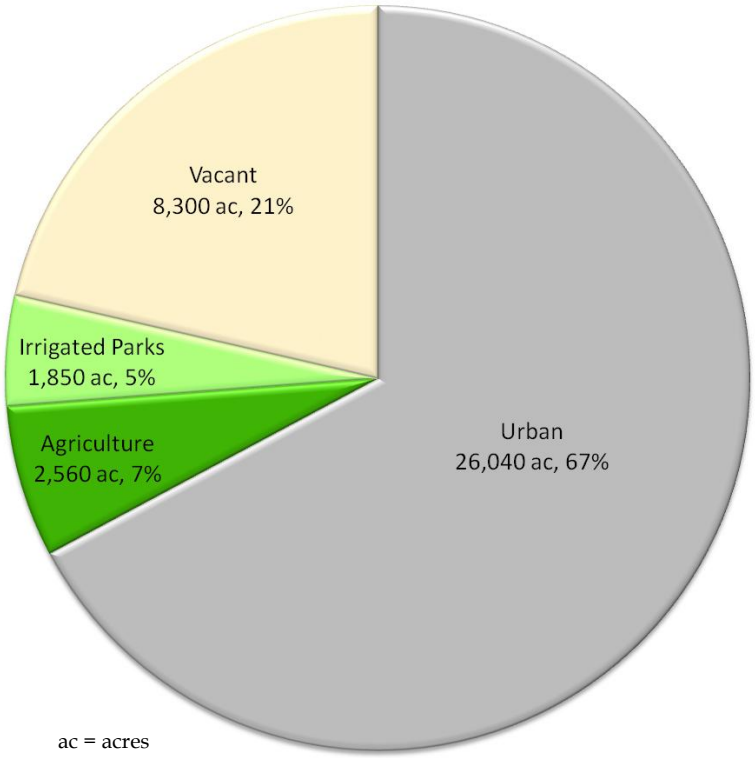
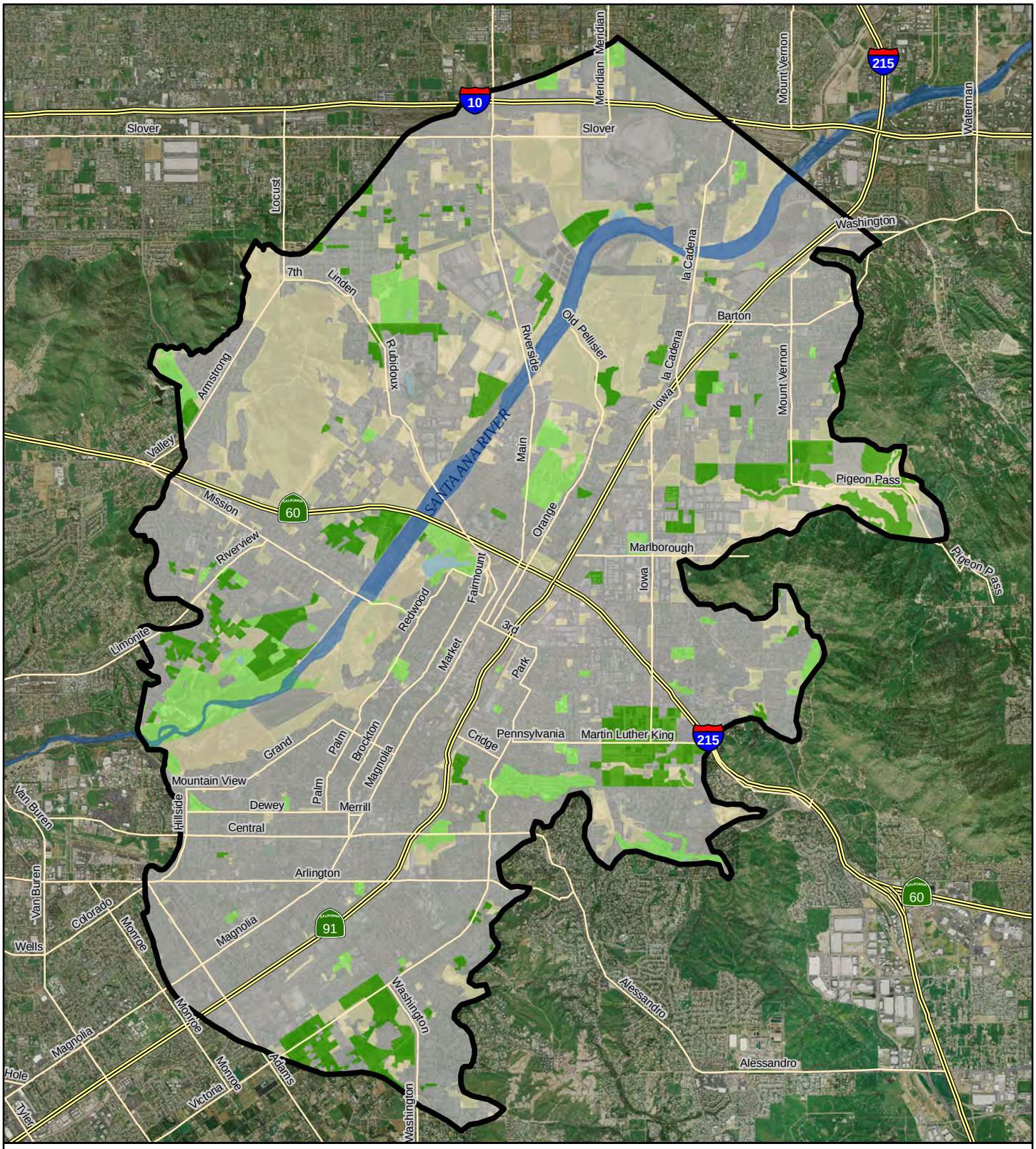


Figure 1.4 Land Use Summary, 2005

The majority of the water supplies for these urban and agricultural uses are provided by Riverside Basin groundwater, making it a critical resource for the future prosperity and sustainability of the region. Approximately 61,700 acre-feet (AF) of groundwater were produced from the Riverside Basin in 2009 (Watermaster, 2010a) for use within and outside of the Basin. Figure 1.6 shows the breakdown of this groundwater production by producer for 2009; more details on the producers, including definitions of "Other" production and "Private Producers" are provided in Section 3.1. Additional supply sources include groundwater from nearby groundwater basins, such as Colton and Bunker Hill; imported water; and recycled water. The Plan Area and the surrounding region are experiencing growth, and water demands are anticipated to increase as a result. As competition for imported water supplies continues to become more intense and as drought, regulatory changes, and potential catastrophic failures threaten imported supplies, groundwater will continue to play a key role in maintaining a cost-effective and reliable water supply for producers in the Riverside Basin.



Legend

Plan Area
Highway
Roads

Land Use *

Urban
Parks
Agriculture
Vacant
Water

*Land use source: SCAG, 2005

N
W E
S

0 0.5 1 2 Miles

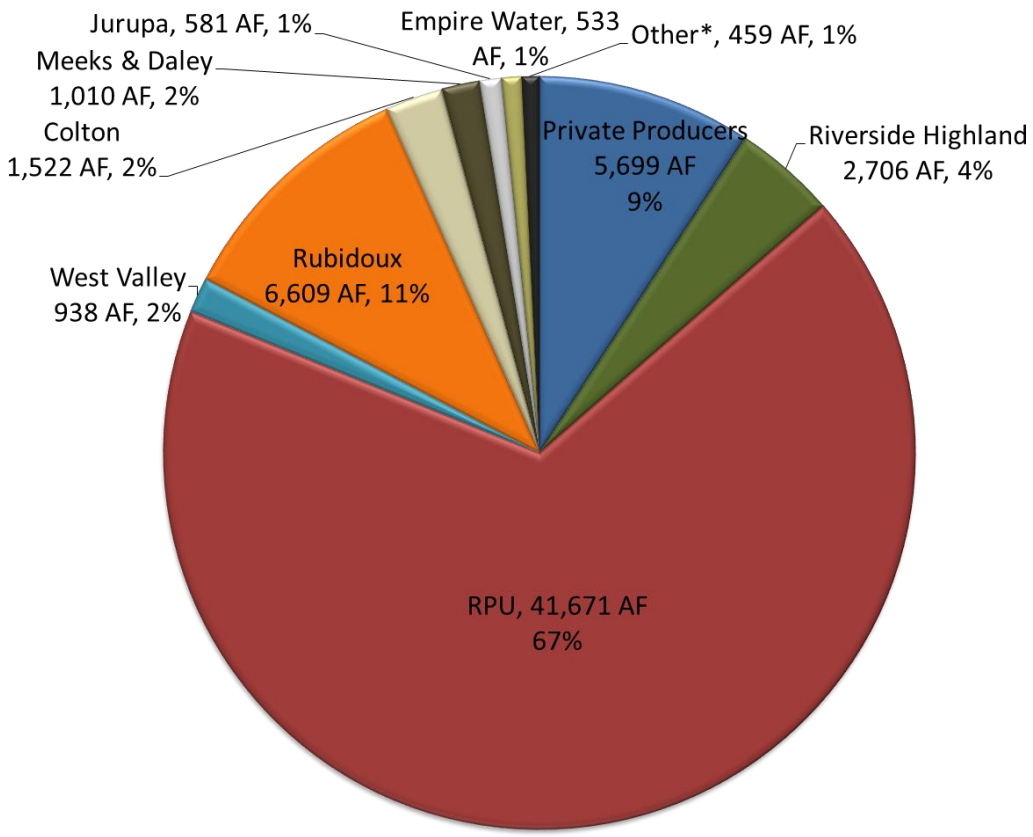
CITY OF RIVERSIDE

Recent Land Use

Riverside Basin Groundwater Management Plan

2011

Figure 1.5



* Agencies listed as "Other" have production of less than 300 AFY over 1999-2009

Figure 1.6 Groundwater Production by Producer, 2009

1.5 LEGISLATION RELATED TO GROUNDWATER MANAGEMENT PLANS

Groundwater is a resource shared by numerous users; it does not recognize or adhere to jurisdictional lines and cannot be tagged for use by certain users. Groundwater rights have evolved through case law since the late 1800s. Currently, three basic methods are available for managing groundwater resources in California:

- Local agency management under authority granted by the California Water Code or other applicable state statutes (such as a GWMP)
- Local government groundwater ordinances or joint powers agreements (JPA)
- Court adjudications

No law requires that any of these forms be applied within a basin. As such, management is often instituted after local agencies or landowners recognize a specific groundwater problem.

The level of groundwater management in any basin or subbasin is often dependent on water availability and demand.

In an effort to standardize groundwater management, the California Legislature passed Assembly Bill (AB) 255 (Stats. 1991, Ch. 903) in 1991. This legislation authorized local agencies overlying basins subject to critical overdraft conditions, as defined in DWR's Bulletin 118-80 (DWR, 1980), to establish programs for groundwater management within their service areas. Water Code § 10750 et seq. provided these agencies with the powers of a water replenishment district to raise revenue for facilities to manage the basin for the purposes of extraction, recharge, conveyance, and water quality management. Seven local agencies adopted plans under this authority (DWR, 2003).

The provisions of AB 255 were repealed in 1992 with the passage of AB 3030 (Stats. 1992, Ch. 947). This legislation greatly increased the number of local agencies authorized to develop a GWMP and set forth a common management framework for local agencies throughout California. AB 3030, codified in Water Code § 10750 et seq., provides a systematic procedure to develop a groundwater management plan by local agencies overlying the groundwater basins defined by DWR's Bulletin 118 (DWR, 1975) and updates (DWR, 1980, 2003). Upon adoption of a plan, these agencies could possess the same authority as a water replenishment district to "fix and collect fees and assessments for groundwater management" (Water Code, § 10754). However, the authority to fix and collect these fees and assessments is contingent on receiving a majority of votes in favor of the proposal in a local election (Water Code, § 10754.3). More than 200 agencies (shown in Figure 1.7) have adopted an AB 3030 GWMP. None of these agencies are known to have exercised the authority of a water replenishment district.

Figure 1.7 Areas with Groundwater Management Plans

Water Code § 10755.2 expands groundwater management opportunities by encouraging coordinated plans and by authorizing public agencies to enter into a JPA or memorandum of understanding (MOU) with public or private entities providing water service. At least 20 coordinated plans have been prepared to date involving nearly 120 agencies, including cities and private water companies.

In 2002, the California Legislature passed Senate Bill (SB) 1938 (Stats. 2002, Ch. 603), which provides local agencies with incentives for improved groundwater

management. While not providing a new vehicle for groundwater management, SB 1938 modified the Water Code by requiring that specific elements be included in a GWMP for an agency to be eligible for certain funding administered by DWR for groundwater projects.

Through AB 3030 and SB 1938, local agencies can now develop GWMPs, such as this Riverside Basin GWMP, that guide the sustainable use of the groundwater resource while also providing access to certain DWR funding sources.

1.6 PRIOR AND CURRENT WATER MANAGEMENT PLANNING EFFORTS

The Riverside Basin has an extensive history of management of groundwater and water resources. This document builds upon those efforts and in no way affects any previous court judgments.

1.6.1 1969 WESTERN JUDGMENT

The judgment in *Western Municipal Water District of Riverside County et al., v East San Bernardino County Water District et al.*, entered April 17, 1969 (1969 Western Judgment), established the entitlements and groundwater replenishment obligations of the two major water agencies, Valley District and Western, relating to groundwater basins in their jurisdictions: the San Bernardino, Riverside, and Colton Groundwater Areas (these areas are defined by DWR as the Bunker Hill Groundwater Basin, Rialto-Colton Groundwater Basin, and the northern portion of the Riverside-Arlington Groundwater Basin). The Riverside Basin is split by the 1969 Western Judgment based on county boundaries into Riverside North (San Bernardino County) and Riverside South (Riverside County).

The case was brought forth following concerns over the increasing groundwater withdrawals upgradient of the Bunker Hill Dike (San Jacinto Fault) for use within San Bernardino and Redlands as well as for export to Riverside County. This case was initially linked to a broader case involving the Chino and San Bernardino basins, as well as the diversions of surface water and pumping of underflow from the Santa Ana River and its tributaries.

The 1969 Western Judgment further implements the physical solution provided for in the Orange County Judgment, as well as determines the rights of Plaintiffs to extract from the San Bernardino Basin Area (SBBA), and provides for replenishment in the area above the Riverside Narrows (a bedrock narrows in the Santa Ana River near the USGS stream gage #11066460 [MWD Crossing]). Under the judgment, only plaintiff parties have rights and limits to extract a defined share of safe yield in the SBBA. Non-plaintiff party extractions are unlimited in exchange for Valley District's commitment to plaintiffs to recharge for any extractions in excess of non-plaintiffs' share of safe yield and any new export as determined by the Western-San Bernardino Watermaster (Watermaster). Western has committed to protect Valley District

against adverse impacts on Valley District's ability to meet its Adjusted Base Flow obligation under the Orange County Judgment at Riverside Narrows by agreeing to provide replenishment between Bunker Hill Dike and Riverside Narrows if extractions in the area between Bunker Hill Dike and Riverside Narrows by users within Western exceed Base Period extractions and if Adjusted Base Flow at Riverside Narrows is found by order of the Court to not be sufficient to satisfy Valley District's obligation under the Orange County Judgment now or in the future. As part of the determination of Western's replenishment obligation between Bunker Hill Dike and Riverside Narrows, Watermaster is also required to account for several factors affecting return flow to Riverside Narrows.

The 1969 Western Judgment affords Valley District maximum flexibility in operation of a coordinated replenishment and management program both above and below Bunker Hill Dike, and as a result there are no limits on flow across Bunker Hill Dike or extractions by users within Valley District below Bunker Hill Dike. However, in exchange for such flexibility, Valley District committed to plaintiffs that it will provide sufficient recharge below Bunker Hill Dike to maintain a specific minimum water level in three specific wells, and that it will be responsible for meeting reasonable provisions for maintenance of water quality in the Colton and Riverside North Basins consistent with Santa Ana Regional Water Quality Control Board objectives provided the 1969 Western Judgment is modified by the Court to include such maintenance. The Court has not modified the 1969 Western Judgment.

The adjudication resulted in the naming of the Watermaster consisting of two persons appointed by the presiding judge, one nominated by Valley District and the other by Western. The Watermaster prepares an annual report documenting the previous water year's pumping and export activities. The 1969 Western Judgment also requires the Watermaster to establish base extraction rights and export rights based on the average annual extractions and exports over the 5-year period from 1959 through 1963 (5-Year Base Period Average). Based on that 5-year period, the Watermaster established 148,165 AF as the base extraction rights for the Riverside South Basin and 105,425 AF as the base extraction rights for Riverside North for use in Riverside County (Watermaster, 2010b), as stipulated by the 1969 Western Judgment.

The Watermaster uses the results of the documented information to make the following determinations as required by the 1969 Western Judgment:

1. Total actual average annual extractions from the SBBA by entities other than plaintiffs for use within San Bernardino County.
2. The natural safe yield of the SBBA based upon the cultural conditions equivalent to those existing during the 5-calendar-year period ending with 1963, determined initially by supplemental order of the Court to be 232,100 AF per annum; the amount is subject to the continuing jurisdiction of the Court.

3. The annual "adjusted right" of each exporter (plaintiff) to extract water from the SBBA based upon the percentage of the natural safe yield determined by the methods used in Table B-2 of the 1969 Western Judgment.
4. The annual production by plaintiffs for comparison with adjusted right determined in Item 3 above.
5. Annual discharge from the City of San Bernardino Water Reclamation Plant to the Santa Ana River as to quantity and quality, assumed for the purposes of the 1969 Western Judgment to be 16,000 AF annually and not subject to verification by the 1969 Western Judgment.
6. Average annual extractions from the Colton Basin area for use outside the San Bernardino Valley.
7. Average annual extractions from the Riverside Basin area within San Bernardino County for use outside the San Bernardino Valley.
8. The average static water levels within the Colton Basin and Riverside Basin within San Bernardino County as determined by the three wells listed in the 1969 Western Judgment (1S 4W 21 Q3, 1S 4W 29 H1, and 1S 4W 29 Q1); the elevation has been established at 822.04 feet above sea level, based on Fall 1963 measurements.
9. The average annual extractions from that portion of the Riverside Basin area in Riverside County which is tributary to the Riverside Narrows for use in Riverside County.
10. Annual amounts of water extracted for use within Western from the San Bernardino Basin and the area downstream from there to the Riverside Narrows that have been exported for use outside the area tributary to the Riverside Narrows.
11. Annual amount of water extracted for use within San Bernardino County from the SBBA and Colton Basin area for use on lands that are not tributary to the Riverside Narrows.
12. Reduction in return flow now contributing to base flows at Riverside Narrows that results from conversion of agriculture using water within Western to domestic or other uses connected to a sewage or waste disposal system, the effluent from which is not tributary to the rising water at Riverside Narrows; the average for 5 years ending in 1963 was established by the 1969 Western Judgment to be 3,916 acres and is not subject to verification.

1.6.2 ORANGE COUNTY JUDGMENT

The adjudication of the Santa Ana River was initiated by a complaint filed by Orange County Water District (OCWD) on October 18, 1963, seeking an adjudication of water rights against substantially all water users in the area tributary to Prado Dam within the Santa Ana River watershed, but excluding San Jacinto Watershed, which is tributary to Lake Elsinore. Thirteen cross-complaints were filed in 1968, extending the adjudication to include substantially all water users in the area downstream from Prado Dam. With some 4,000 parties involved in the case (2,500 from the Upper Area and 1,500 from the Lower Area), many believed that every effort should be made to arrive at a settlement and physical solution in order to avoid enormous and unwieldy litigation. The discussion in this subsection is based on the Western IRWMP (Western, 2008).

The stipulated judgment (Orange County Judgment) in *Orange County Water District v City of Chino et al.*, entered on April 17, 1969 (County of Orange Case No. 117628) became effective on October 1, 1970. It contains a declaration of rights of the water users and other entities in the Lower Area of the Santa Ana River Basin downstream of Prado Dam as against those in the Upper Area tributary to Prado Dam, and it provides a physical solution to satisfy those rights.

The physical solution accomplishes, in general, a regional intrabasin allocation of the surface flow of the Santa Ana River System. The Orange County Judgment leaves to each of the major hydrologic units within the basin the determination and regulation of individual rights therein and the development and implementation of its own water management plan subject only to compliance with the physical solution.

The Orange County Judgment designates four public agencies to represent the interests of the Upper and Lower areas and charges them with fulfilling the obligations set forth in the Orange County Judgment, including the implementation of the physical solution. The Lower Area is represented by OCWD. The Upper Area is represented by Valley District, Western, and Inland Empire Utilities Agency.

The court appoints a Santa Ana River Watermaster, a five-member committee to administer the provisions of the Orange County Judgment. The Santa Ana River Watermaster's duties are to maintain a continuous accounting of each of the items listed in the letter of transmittal and to report annually for each water year to the court and the parties. The water year begins October 1 and ends the following September 30. The Orange County Judgment specifies submission of the annual report 5 months after the end of the water year. The Santa Ana River Watermaster requested that the submission time be extended to 7 months after the end of the water year.

Each year, the Santa Ana River Watermaster uses its long-established procedures to analyze the basic hydrologic and water quality data to determine (at Riverside Narrows and Prado Dam) base flow, base flow total dissolved solids (TDS), adjusted base flow, cumulative credits or

debits to upper area parties, and the minimum required base flow for the following water year. The procedures include determining (for both locations) the amounts of non-tributary flow or other flow to be excluded from base flow, the relative amounts of base flow and storm flow, and the relationships between electrical conductivity and TDS concentrations.

The following are Santa Ana River Watermaster determinations for Prado Dam:

1. Components of flow at Prado Dam, which includes base flow (42,000 AFY minimum), storm flow, non-tributary flow, and Arlington Desalter discharges to the river system
2. Adjusted base flow at Prado Dam credited to the Inland Empire Utilities Agency and Western.

Santa Ana River Watermaster determinations for Riverside Narrows are as follows:

1. Components of flow at Riverside Narrows, which include base flow (15,250 AFY minimum), storm flow, and non-tributary flow
2. Adjusted base flow at Riverside Narrows credited to Valley District.

1.6.3 WATER QUALITY CONTROL PLAN FOR THE SANTA ANA BASIN (BASIN PLAN)

The Santa Ana Regional Water Quality Control Board (RWQCB) developed the 1995 *Water Quality Control Plan for the Santa Ana Basin* (Basin Plan), updated in 2008 and 2011, to protect and, where possible, enhance the quality of waters in the Santa Ana Basin, which includes the entirety of the Riverside Basin. The Basin Plan was developed specifically for the Santa Ana Basin and reflects regional differences in existing water quality, the beneficial uses of the region's groundwater and surface water, and local water quality conditions and problems.

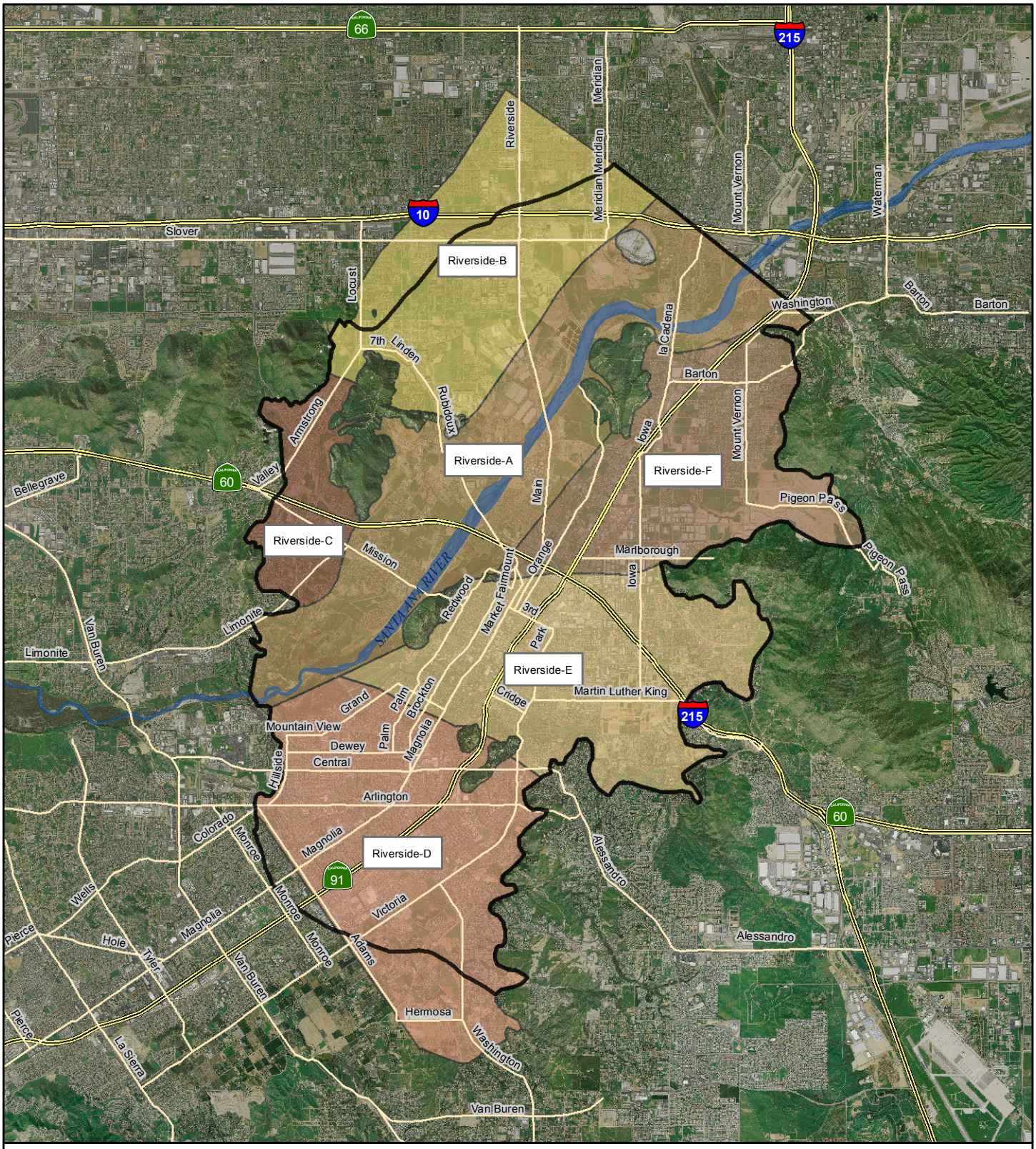
The Basin Plan for the Santa Ana Region includes statements of water quality goals and policies, descriptions of conditions, and discussions of solutions. It is also the basis for the RWQCB's regulatory programs. The Basin Plan establishes water quality standards for the region's groundwater and surface water. The term "water quality standards," as used in the federal Clean Water Act, includes the beneficial uses of specific water bodies and the levels of quality that must be met and maintained to protect those uses. The Basin Plan includes an implementation plan describing the actions by the RWQCB and others necessary to achieve and maintain the water quality standards (RWQCB, 2011).

The plan was updated in February 2008 to incorporate text from previous amendments, change the column format of the document, remove text and tables deleted by the amendments, and revise page numbers. Additional nonsubstantive editorial corrections were made in June 2011.

Notable from the viewpoint of groundwater management in the Riverside Basin are the management zone TDS and nitrate-nitrogen water quality objectives (amended by Resolution No. R8-2004-0001, January 22, 2004). The TDS and nitrate-nitrogen water quality objectives for each management zone are based on concentrations of TDS and nitrate-nitrogen from 1954

through 1973 and are referred to as the antidegradation objectives. Six Basin Plan management zones are wholly or partially within the Riverside Basin, as shown in Figure 1.8. Additional information on TDS and nitrate-nitrogen concentrations within these management zones is provided in Section 2.3.6.1.

The RWQCB's principal means of achieving the water quality objectives and protecting the beneficial uses is the development, adoption, issuance, and enforcement of waste discharge requirements. For TDS and nitrate-nitrogen, the objectives guide implementation of the regulations. The RWQCB's regulatory tools include National Pollutant Discharge Elimination System (NPDES) permits, waste discharge requirements, water reclamation requirements, water quality certification, and waste discharge prohibition. Permits for groundwater recharge involving recycled water are issued by the RWQCB, with recommendations by the California Department of Public Health (DPH).



Legend

- Plan Area
- Highways
- Roads

* Management Zones Source: Wildermuth, 2000

N W E S

0 0.5 1 2 Miles

CITY OF RIVERSIDE

Management Zones

Riverside Basin Groundwater Management Plan

2011

Figure 1.8

1.6.4 WESTERN INTEGRATED REGIONAL WATER MANAGEMENT PLAN

Western prepared an update to its IRWMP in 2008 to plan for long range water supply to meet future demands in a rapidly growing area and to meet water supply reliability needs now and in the future. The essence of the IRWMP is the identification and evaluation of water management strategies that could increase local water supply, thereby improving water supply reliability. Additional benefits of the IRWMP are to address local and regional water quality issues.

Western's member agencies and stakeholders identified approximately 90 water management strategies. These projects were refined, categorized, and compared. Water supply projects were evaluated based on the following criteria:

- Project effectiveness
  - Providing new water supply
  - Improving water quality
  - Providing operational flexibility
  - Restoring ecosystems
- Support of water management strategies
  - Conservation
  - Conveyance and interties
  - Storage (through conjunctive use)
  - Groundwater management/quality protection
  - Water supply
  - Recycled water production or delivery
  - Surface water management/quality
  - Ecosystem protection/restoration/habitat enhancement/wetlands restoration
  - Flood control
  - Land use planning
  - Recreation
- Project commitment
  - Readiness for implementation
  - Availability of local funds
- Other criteria
  - Serves disadvantaged communities
  - Provides regional benefits
  - Provides other benefits

The projects were grouped into three categories:

- Ready-Regional: Regional projects with adequate funding or planning progress to be implemented within the next 3 years
- Ready-Local: Local projects with adequate funding or planning progress to be implemented within the next 3 years
- Future Planning: Projects that will need to acquire more funding to proceed, or are currently at a conceptual level

Of the Ready Projects, the following are of particular interest to the Riverside Basin area:

- Ready-Regional
  - Riverside North Basin Recharge Basin
  - Riverside Pump Station #1 (Raub Regional Emergency Supply Project)
  - Riverside/Arlington Groundwater Basin Model
  - Western Water Use Efficiency Master Plan
- Ready-Local
  - System interconnections with the City of Riverside

1.6.5 UPPER SANTA ANA RIVER WATERSHED INTEGRATED REGIONAL WATER MANAGEMENT PLAN

The Upper Santa Ana River Watershed IRWMP (GEI, 2007a) was initiated in 2005 to address major water management issues for the communities of the Upper Santa Ana River Watershed. The Upper Santa Ana River Watershed includes much of the Riverside Basin, defined as the watershed that flows through the Riverside Narrows. The Upper Santa Ana Water Resources Association developed the plan with a DWR grant and Valley District serving as lead agency. Water managers and stakeholders participated in development of the plan.

The main benefit of the plan is the development of a process for managing the SBBA. A secondary benefit is the identification of regional projects and the receipt of grant funding for these projects.

Two management objectives were developed during the planning process. The first is to improve water reliability during drought periods and reduce liquefaction. The second is to protect water quality and maximize conjunctive use opportunities. Computer models were used to evaluate various water management strategies that could be used to meet the management objectives.

Strategies relevant to groundwater include the following:

- Reduction of liquefaction risks
- Avoidance of impacts to and from groundwater contaminant plumes

- Optimization of storm water recharge
- Protection of water quality

The following projects in the Plan Area are identified for implementation in the Upper Santa Ana River Watershed IRWMP (GEI, 2007a, b):

- Tier 1a – Regional Projects that are "Ready"
  - Pellissier Ranch Barrier Wells and Treatment Plant
  - Riverside-Corona Feeder
  - Riverside Pump Station (Raub Emergency Supply Intertie)
- Tier 1b – Non-regional Projects that are "Ready"
  - Waterman-Gage Intertie
  - Riverside North Recharge Basin
  - Santa Ana River Trail, Phases III and IV
  - Rialto Tertiary Treatment Plant and Reclaimed Water Expansion Study
  - City of San Bernardino Water Recycling – Rapid Infiltration and Extraction (RIX) Facility
- Tier 2 – Projects Needing Additional Work
  - Septic System Conversion Highgrove Area – Phase II
  - Riverside Regional Water Quality Control Plant
- Tier 3 – Projects Further Out on the Planning Horizon
  - South End Feeder
  - South End Pump Station
  - Back Burner Projects
  - Numeric Groundwater Model for Riverside/Arlington Groundwater Basins

1.6.6 SANTA ANA WATERSHED INTEGRATED REGIONAL WATER MANAGEMENT PLAN (ONE WATER ONE WATERSHED)

In 2009, the Santa Ana Watershed Project Authority (SAWPA), in cooperation with numerous stakeholders, completed an IRWMP for the Santa Ana Watershed including the Riverside Basin. This IRWMP, called "One Water One Watershed" or OWOW, was developed to solve problems on a regional scale and give all water interests a voice in the planning process. The OWOW identified the following four key threats to water resources in the region:

- **Climate change** resulting in reduced water supplies combined with increased water needs in the region
- **Colorado River continuing drought** resulting in reduced imported supply due to upper basin entitlements

- **Sacramento-San Joaquin Delta vulnerability** resulting in reduced or lost supply due to catastrophic levee failure or changing management practices of the Delta
- **Population growth and development** resulting in interrupted hydrology and groundwater recharge and increased water needs

The OWOW looked toward 2030 to develop a vision for the Santa Ana Watershed that is drought-proofed and salt-balanced and supports economic and environmental viability.

Through a collaborative stakeholder planning process, major needs were identified, that, if addressed, could have a significant and immediate impact on the water supplies for the future. These needs are as follows:

- Increase storage
- Recycle water
- Desalinate groundwater
- Consider stormwater as a water supply
- Develop risk-based water quality improvements

A project evaluation process for the OWOW identified multi-benefit, multi-jurisdictional projects that meet the needs of the region. The projects will compete for funding under State Proposition 84, Chapter 2, which provides more than $1 billion for new water supply and water quality improvement projects across the state. However, it is anticipated that these funds only will meet a fraction of the Santa Ana Watershed's needs. Remaining funding will need to come through the development of new partnerships and creative, multi-benefit projects to prepare the watershed for a sustainable future (SAWPA, 2010). The OWOW is being updated and additional implementable system-wide integrated projects and programs to assist in meeting the watershed plan goal will be identified as a part of that update.

1.6.7 METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA INTEGRATED WATER RESOURCES PLAN

Metropolitan Water District of Southern California (Metropolitan) developed an Integrated Water Resources Plan (IRP) to establish regional targets for the development of water resources including conservation, local supplies, State Water Project (SWP) supplies, Colorado River Aqueduct supplies, and water drawn from regional storage and purchased through water transfers. These diverse supply sources are intended to provide regional supply reliability.

Metropolitan's IRP was developed in 1996 and updated in 2003 and again in 2010. The original IRP was developed as a two-phase process over a 2 ½-year period. Phase 1 included data collection, analysis, and decision-making. The following were major accomplishments during this phase:

- Defining resource management and business principles

- Determining the reliability targets for the region
- Projecting water demands
- Identifying resource options

Phase 2 focused on developing a preferred resource mix and evaluating coordinated local water management efforts. Resource targets were developed for the following:

- Conservation
- Recycling, groundwater recovery, and seawater desalination
- SWP
- Colorado River Aqueduct
- In-region surface water storage
- In-region groundwater storage
- Central Valley/SWP transfers and storage

The local project identified in the Riverside Basin area is Western's nearby Arlington Desalter Expansion. Metropolitan is supportive of efficient management and use of local water resources such as is envisioned in this plan (Metropolitan, 2004).

The 2010 update to the IRP maintains traditional imported supplies from Northern California and the Colorado River while expanding local programs to meet future needs. Projections in the 2010 IRP are through 2035, with conservation savings expected to be greater than any single source of supply (Metropolitan, 2010).

1.7 PUBLIC PROCESS IN DEVELOPING THE GROUNDWATER MANAGEMENT PLAN

The development of any GWMP is a collaborative process involving all interested stakeholders. Public input is critical to the success of the Riverside Basin GWMP and was a key component of its development.

The public was informed and encouraged to provide input and participate in the development of the GWMP through the following:

- GWMP web site: www.riversideplan.com provided information to the public regarding the GWMP. Details about groundwater management in general and specific to the Riverside Basin were provided. Meeting dates, locations, and materials were posted along with details of the Riverside Basin GWMP Advisory Committee (Advisory Committee) and contact information.
- Newspaper advertisements in the *Riverside Press-Enterprise* gave notice of public hearings.

- Public hearings provided opportunities for personal communications that would be captured in the public record on specific topics, including adoption of resolutions of intent to draft a GWMP and a resolution of adoption of the GWMP.
- Public meetings provided details on the GWMP process and solicited input.
- Advisory Committee meetings provided detailed technical information on the GWMP and solicited input.
- Direct communication by telephone, email, and mail was encouraged at meetings and on the web site. Comments could be sent to the RPU project manager or the consultant project manager.

Key meetings, hearings, and other activities are summarized in the following sections.

1.7.1 NOVEMBER 5, 2008

A stakeholder meeting was held at 6 p.m. November 5, 2008 on the campus of California Baptist University in Riverside. Letters were sent to stakeholders based on well ownership records of the Watermaster and lists of local agencies. A sample of the letters is shown in Appendix A. Letters were provided to:

- Agua Mansa Properties
- Roger Aguinaga Company, Inc.
- Alamo Water Company
- Box Springs Mutual Water Company
- California Baptist University
- California Portland Cement Company
- City of Colton
- City of Corona
- Corridor Land Company (Owl Resources)
- El Rivino Country Club
- Elsinore Valley Municipal Water District
- Gage Canal Company
- General American Transportation Company
- City of Grand Terrace
- Green Acres
- Green Acres Memorial Park Association
- Holliday Trucking
- Home Gardens
- Indian Hills Country Club
- Jurupa
- La Sierra University

- Loring Ranch 31503 LP
- Loving Homes Greens Homeowners
- Meeks & Daley
- Merryfield Water Company
- Montecito Memorial Park
- City of Norco
- RIX facility
- Reche Canyon Mutual Water Company
- City of Riverside Parks and Recreation
- Riverside Canal Power Company
- Riverside Cement Company
- Riverside County Flood Control and Water Conservation District (RCFCWCD)
- Riverside County Parks Department
- Riverside Highland
- Rubidoux Community Services District
- RWQCB
- SAWPA
- Tri-County Linen Supply
- Universal Forest Products
- University of California, Riverside
- USGS
- Victoria Country Club
- West Riverside 350 Inch Water Company
- West Valley
- Watermaster
- Western
- Yeager, Reidman & Horn

The meeting was open to the public and was well attended. According to the sign-in sheet, the following organizations were represented at the meeting:

- Agua Mansa Properties
- Alamo Water Company
- California Portland Cement Company
- California Baptist University
- Corona
- Elsinore Valley Municipal Water District
- GFB & Associates
- Gage Canal Company
- Jurupa

- Riverside County Parks Department
- RCFCWCD
- RPU
- Rubidoux
- City of San Bernardino Municipal Water Department
- Tri-City Linen
- Victoria Club
- Western
- Watermaster

A presentation was given describing GWMPs, including the components, benefits, and the procedures. The Advisory Committee was introduced and interested parties were invited to join the committee. The importance of stakeholder participation was stressed and the various options for participation were described. The concept of basin goals and BMOs was discussed with potential options for the basin. Stakeholder input was solicited on all items and a question-and-answer period allowed for response to stakeholder questions and concerns.

1.7.2 NOVEMBER 21, 2008 AND DECEMBER 16, 2008

A public hearing was held at 8:30 a.m. on November 21, 2008 at the RPU Board Room in Riverside. The public was notified through advertisements in the *Riverside Press-Enterprise* on November 5, 2008 and November 12, 2008. The advertisement was a written statement provided to the public describing the manner in which interested parties may participate in developing this GWMP. At the hearing, the RPU Board conducted the initial public hearing regarding the City of Riverside's intent to draft a groundwater management plan for the Riverside Basin in accordance with the requirements of Water Code Section 10750 et. seq. and to receive public comment regarding the intention to draft the GWMP. Discussion at the hearing included a presentation to the Board and the public describing the GWMP, including cost, components, benefits, procedures, and opportunities for public input. Public comments were solicited, but none were received at the hearing. The Board recommended that the City Council adopt a resolution of intention to draft the GWMP for the Riverside Basin. The City Council adopted the resolution at its December 16, 2008 meeting as Resolution Number 21767. The resolution was advertised in the *Riverside Press-Enterprise* on December 26, 2008 and January 2, 2009. The resolution, advertisements, and meeting minutes are included in Appendix A.

1.7.3 MARCH 18, 2009

An Advisory Committee meeting was held on March 18, 2009 at the RPU offices to discuss the following:

- Why the GWMP is being developed
- How the GWMP would affect other agencies or other stakeholders

- What the goal and objectives of the GWMP will be
- What are the next steps in the development of the GWMP

A presentation was given followed by a question-and-answer period. The meeting was attended by representatives of the following:

- City of San Bernardino Municipal Water Department
- RPU
- Western
- Colton
- Jurupa

1.7.4 JULY 13-22, 2010

Stakeholders were provided with a copy of the draft Sections 1-5 of the GWMP to develop a common understanding of the basin conditions prior to development of the remainder of the document. The draft of Sections 1-5 was posted on the website (www.riversideplan.com) and provided to the following:

- Colton (July 13, 2010)
- West Valley (July 14, 2010)
- Jurupa (July 14, 2010)
- Riverside Highland (July 17, 2010)
- Rubidoux (July 20, 2010)
- Valley District (July 22, 2010)

Comments were received and incorporated into the document.

1.7.5 NOVEMBER 19, 2010 AND DECEMBER 14, 2010

A public hearing was held at 8:30 a.m. on November 19, 2010 at the RPU Board Room in Riverside. The public was notified through advertisements in the *Riverside Press-Enterprise* on November 4, 2010 and November 18, 2010. The advertisement was a written statement describing the manner in which interested parties may participate in developing this GWMP. At the hearing, the RPU Board conducted a second public hearing regarding the City of Riverside's intent to draft a groundwater management plan for the Riverside Basin in accordance with the requirements of Water Code Section 10750 et. seq. and to receive public comment regarding the intention to draft the GWMP. Discussion at the hearing included a presentation to the Board and the public describing the GWMP, including cost, components, benefits, procedures, and opportunities for public input. Public comments were solicited, but none were received at the hearing. The Board recommended that the City Council adopt a resolution of intention to draft the GWMP for the Riverside Basin. The City Council adopted the resolution at its December 14, 2010 meeting as Resolution Number 22140. The resolution

was advertised in the *Riverside Press-Enterprise* on February 17, 2011 and February 24, 2011. The resolution, advertisements, and meeting minutes are included in Appendix A.

1.8 ADVISORY COMMITTEE

The Riverside Basin GWMP Advisory Committee was organized to solicit input and direct the development of the GWMP. Agencies were invited to send representatives to participate in the Advisory Committee. Other stakeholders were invited to join through the public notification process, including hearings, letters, the web site, and public meetings. Table 1.1 lists the Advisory Committee members and their affiliation. The level of participation varied by member, but included meeting attendance, document reviews, submission of agency data, and/or other communication and coordination. Advisory Committee activities occurred from late 2008 through early 2011 to coordinate stakeholder input and incrementally build the GWMP.

Table 1.1 Advisory Committee

Agency or Company	Representative
Colton	Mike Medina
Jurupa	Umesh Shah
Riverside Highland	Don Hough
City of Riverside, RPU	Max Rasouli
Rubidoux	Steven Appel
City of San Bernardino	John Claus
Valley District	Sam Fuller
West Valley	Ken Sikorski
Western	Fakhri Manghi

1.9 RIVERSIDE BASIN GWMP AND CONSISTENCY WITH CALIFORNIA WATER CODE

Groundwater management is the planned and coordinated local effort of sustaining the groundwater basin in order to meet future water supply needs. With the passage of AB 3030 in 1992, local water agencies were provided a systematic way of formulating GWMPs (California Water Code, § 10750 et. seq.). SB 1938, passed in 2002, further emphasizes the need for groundwater management in California. SB 1938 requires AB 3030 GWMPs to contain specific plan components to receive state funding for water projects. The Riverside Basin GWMP includes the seven components required for DWR funds for the construction of groundwater projects or groundwater quality projects. The GWMP also addresses the recommended 12 specific technical issues identified in the Water Code along with the 7 components recommended in DWR Bulletin 118-03 (DWR, 2003). Table 1.2 lists the required and recommended components and identifies the specific section of this GWMP in which the components are discussed.

Table 1.2 Riverside Basin GWMP Components

Component	GWMP Section(s)
SB1938 Mandatory	
1. Documentation of public involvement	1.7
2. BMOs	6.3
3. Monitoring and management of groundwater elevations, groundwater quality, inelastic land subsidence, and changes in surface water flows and quality that directly affect groundwater levels or quality	7.3
4. Plan to involve other agencies located in the groundwater basin	7.4.1
5. Adoption of monitoring protocols	7.3, App. D
6. Map of groundwater basin boundary, as delineated by DWR Bulletin 118, with agencies' boundaries subject to GWMP	Figure 1.1, 1.2, and 1.3
7. For agencies not overlying groundwater basins, GWMP prepared using appropriate geologic and hydrogeologic principles	n/a
AB 359 Mandatory	
1. Map identifying recharge areas	Figure 7.2
AB 3030 and SB 1938 Voluntary	
1. Control of saline water intrusion	7.2.1
2. Identification and management of well protection and recharge areas	7.2.2
3. Regulation of the migration of contaminated groundwater	7.2.3
4. Administration of well abandonment and destruction program	7.2.4
5. Control and mitigation of groundwater overdraft	7.1.1
6. Replenishment of groundwater	7.1.2
7. Monitoring of groundwater levels	7.3.1
8. Development and operation of conjunctive use projects	7.1.3
9. Identification of well construction policies	7.2.5
10. Construction and operation of groundwater contamination cleanup, recharge, storage, conservation, water recycling, and extraction projects	7.2.6
11. Development of relationships with state and federal regulatory agencies	7.4.2
12. Review of land use plans and coordination with land use planning agencies to assess activities that create reasonable risk of groundwater contamination	7.4.4
DWR Bulletin 118 Recommended	
1. Management with guidance of Advisory Committee	1.8, 7.4.1
2. Description of area to be managed under GWMP	1.2
3. Links between BMOs and goal and actions of GWMP	6, 7, and 8
4. Description of GWMP monitoring programs	7.3, App. D
5. Description of integrated water management planning efforts	1.6, 7.4.3
6. Report of implementation of GWMP	7.4.5
7. Periodic evaluation of GWMP	7.4.5

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2 WATER RESOURCES CONDITIONS

2.1 CLIMATE

The Plan Area is located in a semi-arid area region characterized by dry, hot summers and precipitation concentrated during mild winters. This climate results in significantly higher water demand in the summer than in the winter. Average monthly high and low temperature and average monthly reference evapotranspiration are shown in Table 2.1.

Table 2.1 Average Monthly Temperature and Reference Evapotranspiration

Parameter	Month												Annual
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Average Maximum Temperature (°F)*	66.4	67.9	70.2	75.0	79.5	86.6	93.9	94.4	90.6	82.5	73.5	67.5	79.0
Average Minimum Temperature (°F)*	41.6	43.3	45.0	47.9	52.6	56.3	60.7	61.3	58.4	52.5	45.5	41.3	50.5
Average Reference Evapotranspiration (in)**	2.49	2.91	4.16	5.27	5.94	6.56	7.22	6.92	5.35	4.05	2.94	2.56	56.37

* Source: Western Regional Climate Center, 2009.

** Source: California Irrigation Management Information System (CIMIS), 2009.

The RCFCWCD collects area precipitation data at Station 179 and several other stations. Station 179 is located at the City of Riverside Fire Station #3 on Riverside Avenue, near the intersection of Highway 91 and Central Avenue (Figure 2.1). Data from Station 179 are considered reliable and high-quality as it is located near the center of the Plan Area and has a long period of record, with daily data from 1880 to 2009. The historical record of annual precipitation and the cumulative departure from annual average at Station 179 are shown on Figure 2.2. The cumulative departure from annual average line shows the accumulation, since 1880, of the differences (departures) in annual total precipitation from the average value for each year for the period of record; a rising line represents wetter-than-normal conditions while a falling line represents drier-than-normal conditions. The long-term average annual precipitation for the period from 1880 to 2009 is 10.6 inches.

Legend

- Plan Area
- Highways
- Roads
- Rainfall Station
- Stream Gage

N W E S

0 0.5 1 2 Miles

CITY OF RIVERSIDE

Rainfall and Streamflow Stations

Riverside Basin Groundwater Management Plan

2011

Figure 2.1

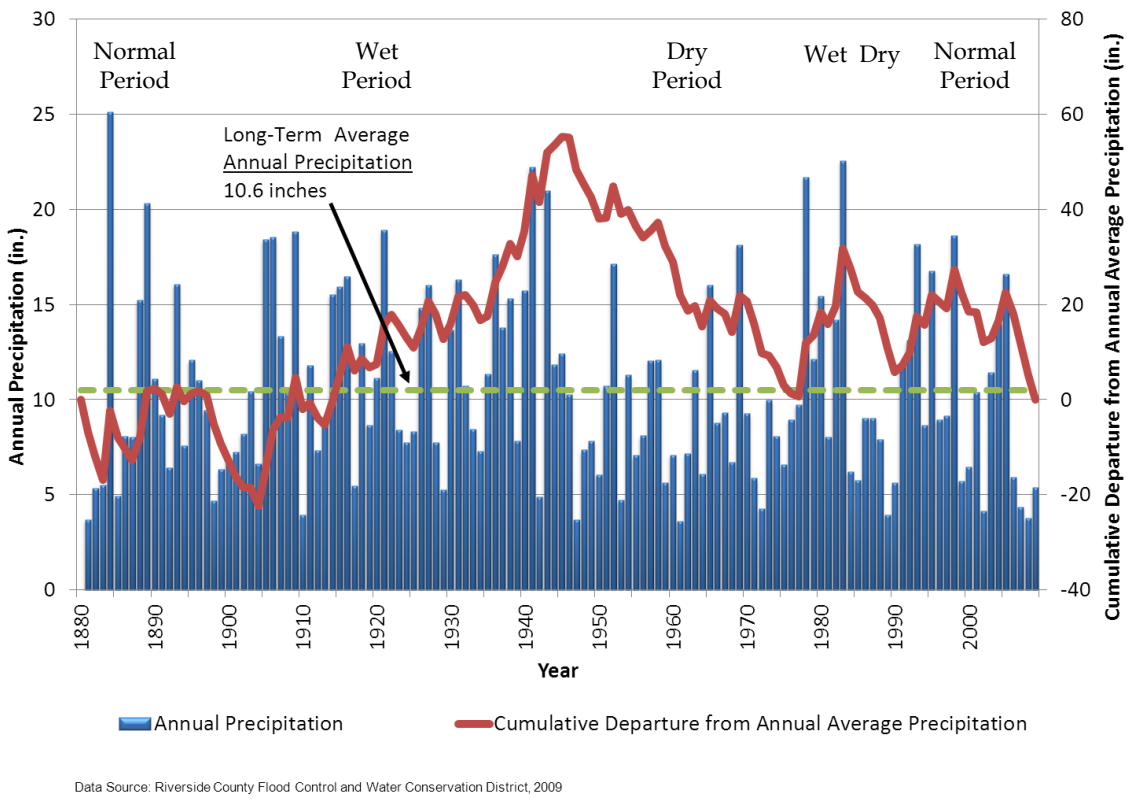
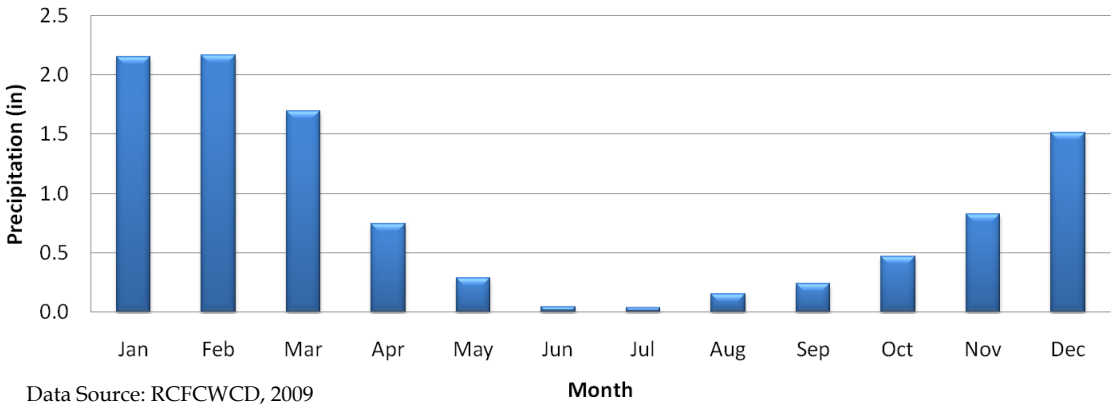


Figure 2.2
Historical Annual Precipitation and Cumulative Departure from Mean Precipitation

The cumulative departure from annual average precipitation chart shows an extended wet period from 1905 through the mid-1940s, followed by an extended dry period through the mid-1970s. Wet and dry periods have an impact on water supplies and water demands. In dry periods, groundwater in the Riverside Basin and surrounding basins is impacted through reduced recharge as a result of reduced precipitation and the associated reduced surface water flows, which can impact long-term availability of the groundwater resource. Wet periods have the opposite effect, increasing recharge to the basin. Demand is also impacted by precipitation, with increased demands due to evapotranspiration and decreased precipitation during dry periods occurring simultaneously with increased voluntary and mandatory conservation efforts.

Figure 2.3 shows the long-term average monthly precipitation at Station 179. Most precipitation occurs during the mild winters, from November through April. Across the basin, annual precipitation ranges from 9 to 11 inches in the southern Riverside Basin to approximately 14 inches in the northern part of the basin. Precipitation in the SBBA averages nearly 1.5 times the precipitation at the Riverside station and therefore, streamflow in the Riverside Basin is more directly related to precipitation in San Bernardino.



Data Source: RCFCWCD, 2009

Figure 2.3
Average Monthly Precipitation

2.2 SURFACE WATER

The major surface water feature in the Riverside Basin is the Santa Ana River, the largest coastal stream in Southern California, with a drainage basin of approximately 2,470 square miles (Scott, 1977). The USGS operates four Santa Ana River stream gaging stations in and around the basin. Three of the gages are near the intersection of Interstates 10 and 215 (to the north in the Colton Basin) and one is located just downstream of Riverside Narrows. Two of the three upstream gages are on tributaries to the Santa Ana River: Lytle Creek and Warm Creek. The Santa Ana River and the four USGS stream gages are shown on Figure 2.1. Table 2.2 provides location and data availability of the selected USGS stream gages.

Table 2.2
Location and Data Availability of Selected USGS Stream Gages

Station No.	Water Course	Location	Available Data		
			Frequency	Start Date	End Date
11059300	Santa Ana River	E Street at I-10	Daily	March 1939	Present
11066460	Santa Ana River	MWD Crossing at Riverside Narrows	Daily	March1970	Present
11060400	Warm Creek	Near San Bernardino	Daily	March 1964	Present
11065000	Lytle Creek	Colton	Daily	October 1957	Present

Over the 1975 to 2005 time period, the annual average Santa Ana River inflow is less than 50,000 AFY; however, the inflows can exceed 200,000 AFY during flood years. On average, the total Santa Ana River inflows are less than the total outflows at Riverside Narrows. This is due to stream gains from rising groundwater at the Riverside Narrows area, surface water drainage from the area, and reclaimed water discharges.

2.3 GROUNDWATER

Groundwater is produced from alluvial sediments in the Riverside Basin and has been a reliable source of water for more than a century. Significant recharge to the basin occurs from the Santa Ana River as well as from precipitation, applied water, and recharge from surrounding watersheds. Water quality is good, with some impacts to ambient water quality from TDS and nitrate and from point-source contamination. TDS and nitrate concentrations generally increase from north to south across the basin. Point source contaminants include perchlorate north of the basin and dibromochloropropane (DBCP) within the basin. Additional details are provided in the following sections.

2.3.1 GEOLOGIC SETTING

The Riverside Basin is located within the Perris Block of the northern Peninsular Ranges. The Peninsular Ranges are northwest oriented mountain ranges and faults extending from the Los Angeles Basin to the tip of Baja California. The Riverside Basin is an alluvium-filled feature between such mountain ranges, with the Santa Ana River flowing through the northern portion of the basin (DWR, 2003; Harden, 1998; Woodford et al, 1968). The boundaries are shown in Figure 1.1 and are based on the impermeable rocks of Box Springs Mountains on the southeast, a surface water flow divide to the south, and the Jurupa Mountains on the northwest. The northeast boundary is formed by the Rialto-Colton fault, and a portion of the northern boundary is a groundwater divide beneath the Bloomington area between the Cities of Rialto and Fontana (DWR, 2003).

2.3.2 WATER-BEARING FORMATIONS

Groundwater in the Riverside Basin is generally unconfined and found in alluvial deposits of depths up to 700 feet. These Quaternary Period alluvial deposits consist of gravel, sand, silt, and clay, deposited by the Santa Ana River, Lytle Creek, and other surface channels in a bedrock canyon formed by ancient drainage systems running from south to north, emptying into the main portion of the Santa Ana Basin near Colton (Eckis, 1934).

Eckis (1934) describes materials that can be divided into flood plain deposits along the Santa Ana River and Riverside terrace materials on the bench southeast of the flood plain. The upper 50 feet of deposits in the flood plain contain significant gravels and sands. Below 50 feet, the

percentage of gravels increases. The upper 50 feet of deposits in the Riverside terrace are mostly clay, likely due to weathering of the original gravels and sands. At depth (greater than 50 feet for the flood plain deposits and greater than 150 feet for the Riverside terrace) the percentages of gravel, sand, and clay are similar, primarily gravel with clay and with very little sand.

Eckis (1934) further finds that, based on data from wells, unweathered gravels at the extreme northern end of the basin have a minimum specific yield of 15 percent. The specific yield increases to 18 percent near the Santa Ana River, then increases gradually to a maximum of 20 percent near the Arlington Basin.

For specific details on the water-bearing formations incorporating more recent data, a three-dimensional hydrostratigraphic model (3-D model) (Numeric Solutions, 2010) of the Riverside Basin and surrounding area was created for use in developing a single groundwater model, RAGFM, for the Riverside and Arlington basins. RAGFM is discussed in further detail in Section 1.3, Groundwater Model. The 3-D model was based on available drillers logs coded with depth based on lithology. Interpolation techniques were used to develop the 3-D model from ground surface to bedrock. The 3-D model shows higher permeability soils along the Santa Ana River, typically with thicknesses of less than 200 feet. Additionally, materials in the deeper portion of the aquifer system are shown to be relatively lower in conductivity than those in the shallower portions. Details are shown in the cross-sections of the alluvial basin from the 3-D model, which are included in Appendix B.

Recharge to the basin occurs from precipitation and percolation from applied water at the land surface (outdoor irrigation, agricultural irrigation), recharge from the Santa Ana River, and underflow from surrounding basins and mountain fronts.

2.3.3 SOILS

Surface soils impact the amount of water that infiltrates to groundwater as opposed to contributing to surface runoff. A relevant soil classification used by the U.S. Department of Agriculture Natural Resources Conservation Service for hydrology is the hydrologic soil group. The hydrologic soil group can be used to estimate the amount of infiltration that can be expected from specific soil types. This can be useful for determining areas of natural recharge or areas suitable for artificial recharge facilities. The grouping was developed from water intake estimates during the latter part of a storm of long duration, after the soil profile is wet and has an opportunity to swell, without the protective effect of any vegetation. Also considered are depths to the seasonal high water table and to a low permeability layer. The classification is useful at a planning level, but detailed studies are required for a thorough understanding of the infiltration capacity of soils. Features such as slope, ground cover, or distance from low permeability subsurface materials to the upper soil profile may impact the soil's capability to infiltrate water. Under the hydrologic soil group classification system, soils are grouped A to D

with A having the lowest runoff potential (highest infiltration rates) and D having the highest runoff potential (lowest infiltration rates), as summarized in Table 2.3.

Table 2.3
Characteristics of Hydrologic Soil Groups

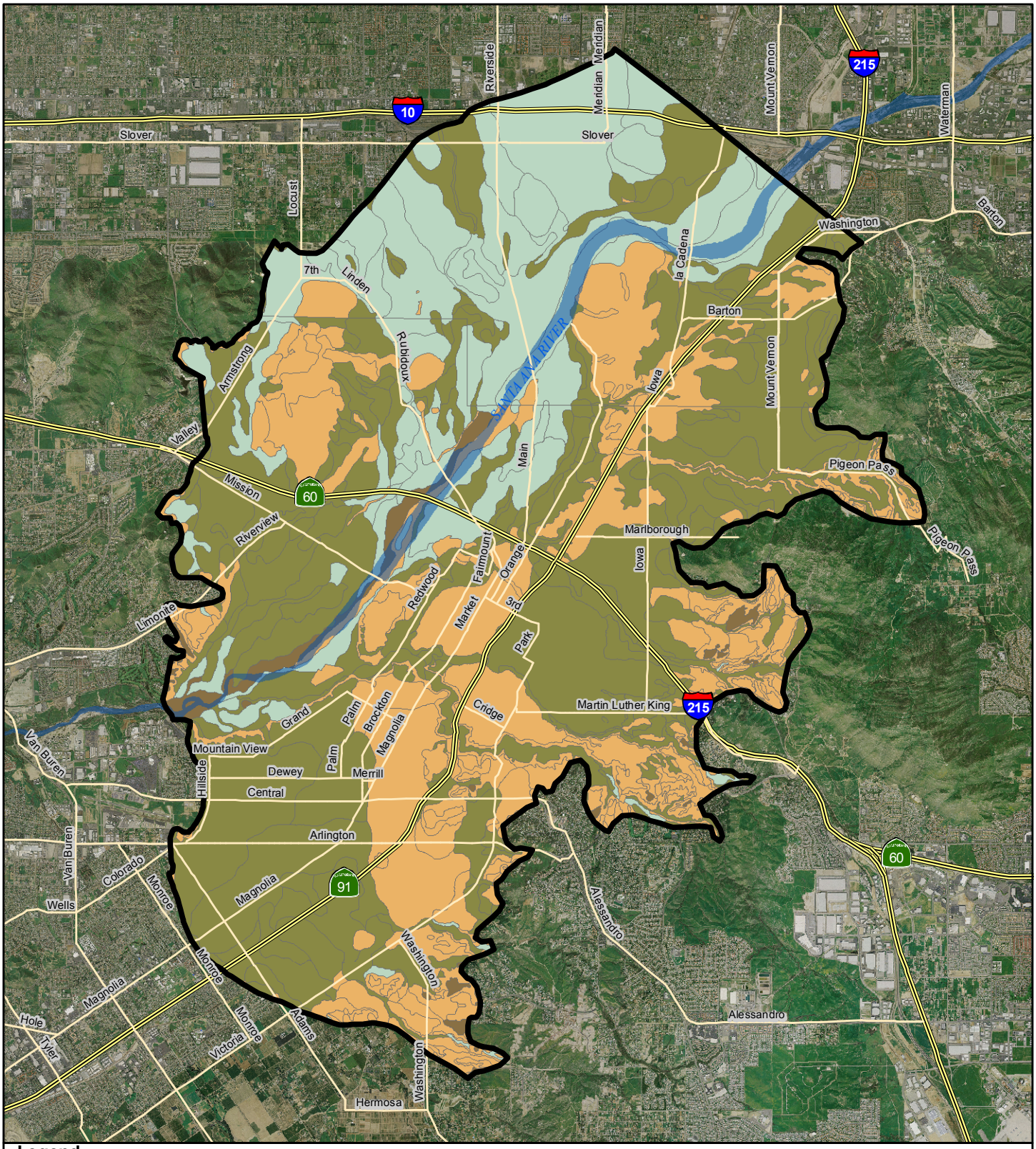
Soil Group	Characteristics
Group A	Sand, loamy sand, or sandy loam; low runoff potential and high infiltration rate. Primarily deep, well drained soils with high sand or gravel content.
Group B	Silt loam or loam; moderate infiltration rate when thoroughly wetted. Mostly deep to moderately deep, well drained soils with moderate to low sand content.
Group C	Sandy clay loam; low infiltration rates when thoroughly wetted. Fine to moderately fine texture, often with layers that block downward movement of water.
Group D	Clay loam, silty clay loam, sandy clay, silty clay, or clay. Very fine texture with high runoff potential and low infiltration rates. Often very shallow, over bedrock or high water table.

A map of hydrologic soils groups is provided in Figure 2.4 (Knecht, 1971). In the Riverside Basin, high permeability A soils are mainly along the Santa Ana River and in the area north of the Santa Ana River and east of Rubidoux Boulevard. Remaining soils in the basin are classified as B or C with very few D soils. Hydrologic soils group information may be used as one criterion for identification of areas suitable for artificial recharge of groundwater, protecting recharge areas, or identifying areas vulnerable to groundwater contamination.

2.3.4 HISTORICAL DEVELOPMENT PATTERNS

Significant early groundwater development in the Riverside area coincides with the beginnings of the citrus industry. In the 1880s, citrus growers in the area began growing a new orange variety from Bahia, Brazil. The rapid dominance of this variety, known as the Washington Naval Orange, in the 1890s resulted in great wealth for the Riverside area, and increased the demand for irrigation water to provide consistent, high-quality water to the trees (Lawton and Weathers, 1989). Numerous wells, including wells that would supply the Gage Canal, were installed in this time period. Municipal wells date back to a similar period. Vivenda Water Company, a precursor of Riverside Highland, installed its first well in 1890, an artesian well near Lytle Creek (Brown and Boyd, 1922).

By 1922, groundwater was practically at ground surface throughout the flood plain area and 20 to 50 feet higher northeast of Riverside in the Riverside terrace area. Into the 1930s, there was generally a groundwater surplus with significant groundwater discharges into the lower portions of the Santa Ana River as well as groundwater evapotranspiration (Eckis, 1934). The high water levels are generally attributed to the percolation of irrigation water, particularly in the southeastern portions of the basin.



Legend

Plan Area

Highways

Roads

Hydrologic Soil Group (Runoff / Infiltration Potential)

- A (Very Low / High)
- B (Low / Moderate)
- C (Moderate / Low)
- D (High / Very Low)

N W E S

0 0.5 1 2 Miles

CITY OF RIVERSIDE

Hydrologic Soil Groups

Riverside Basin Groundwater Management Plan

2011

Figure 2.4

Land use changed in the post-World War II era as urbanization replaced much of the citrus groves with residential, commercial, and industrial development. The shift from agricultural to urban uses brought different water demand patterns, water return flows to the aquifer, and water quality needs. Further discussion of more recent water supplies can be found in Section 3, Water Requirements and Supplies.

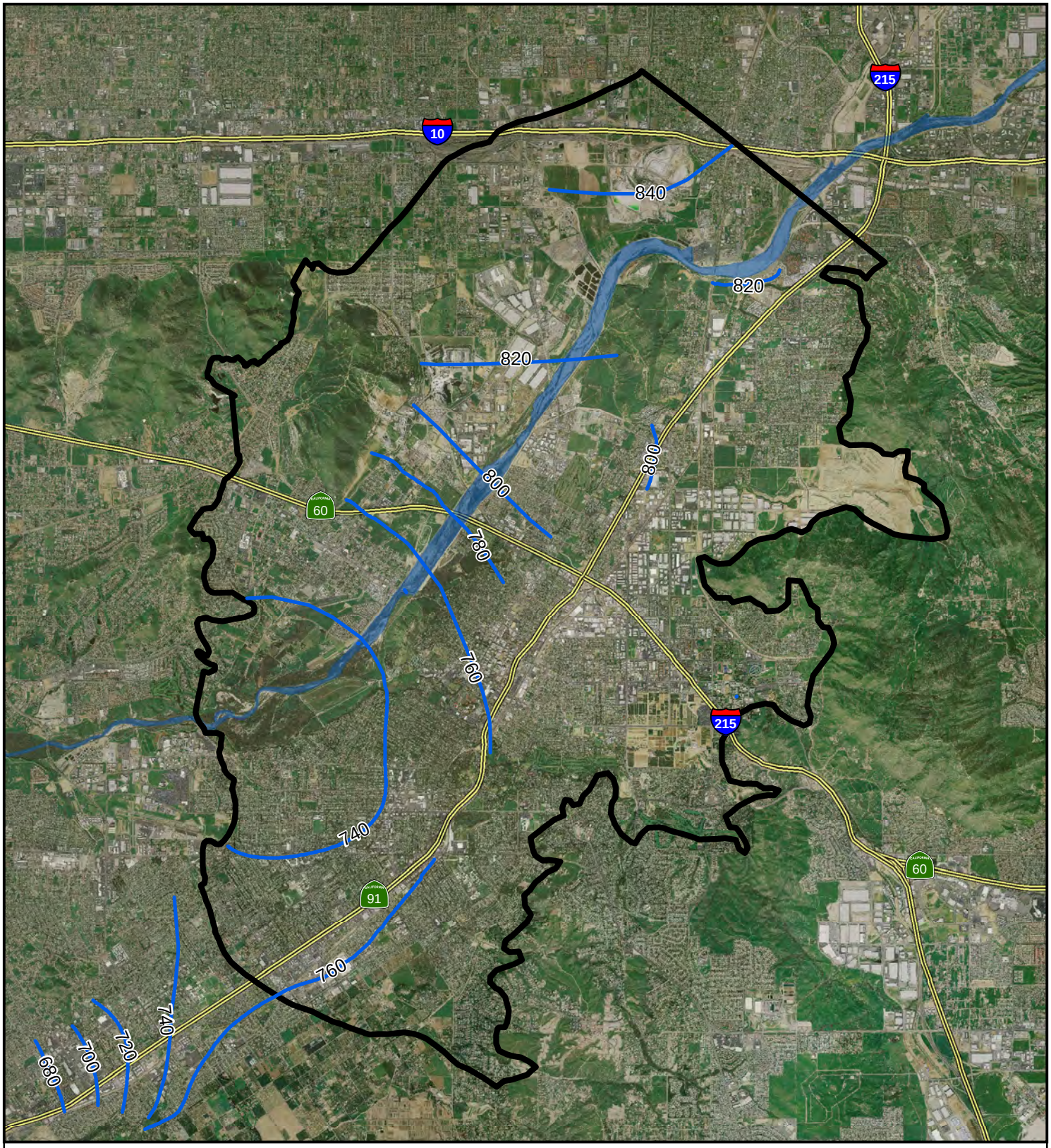
2.3.5 GROUNDWATER LEVELS

As discussed previously, land use patterns and water demands in the Riverside Basin have changed over the years as the once dominant agriculture gave way to increasing urbanization. In spite of these changes, water levels today remain similar to those in the 1930s. Figure 2.5 shows recent groundwater levels from Fall 2009. Figure 2.6 compares water levels in January 1933 (Eckis, 1934) to Fall 2009 (Western and Watermaster Support Services, 2010), showing that the recent water levels are generally within 40 feet of the water levels of approximately 80 years ago with similar flow patterns toward Riverside Narrows. The historical precipitation data in Figure 2.2 shows that January 1933 was toward the end of a long wet period. Hydrographs of water levels at 13 selected wells, shown in Figure 2.7 and Figure 2.8, demonstrate water level changes over time through different hydrologic conditions. Generally, these hydrographs show increasing water levels after approximately 1960 and stabilizing or declining somewhat after the 1980s.

2.3.6 GROUNDWATER QUALITY

In general, groundwater quality in the Riverside Basin is good (RPU, 2005). The overlying water agencies produce annual Consumer Confidence Reports that show their overall water supply meets or exceeds state and federal standards. The reports are included in Appendix C. While the Consumer Confidence Reports publish treated water quality, which is of importance to the customer, this section discusses raw water quality, which can impact treatment costs or treatment feasibility for the groundwater producer.

Overall groundwater quality concerns in the Riverside Basin, reflecting groundwater in its untreated state, generally focus on regional non-point issues with nitrates and TDS, and point-sources of chemicals such as DBCP and perchlorate. Ambient groundwater quality in the basin is influenced by the Santa Ana River, which provides a large quantity of relatively high quality water to the areas along the river. Areas farther from the river receive less direct recharge from the river, and generally have lower quality groundwater.



Legend

- Plan Area
- Highway
- Santa Ana River
- Fall 2009 Water Levels (ft MSL)*

*Fall 2009 Groundwater Elevation from Western and Watermaster Support Services database, 2010

N W E S

0 0.5 1 2 Miles

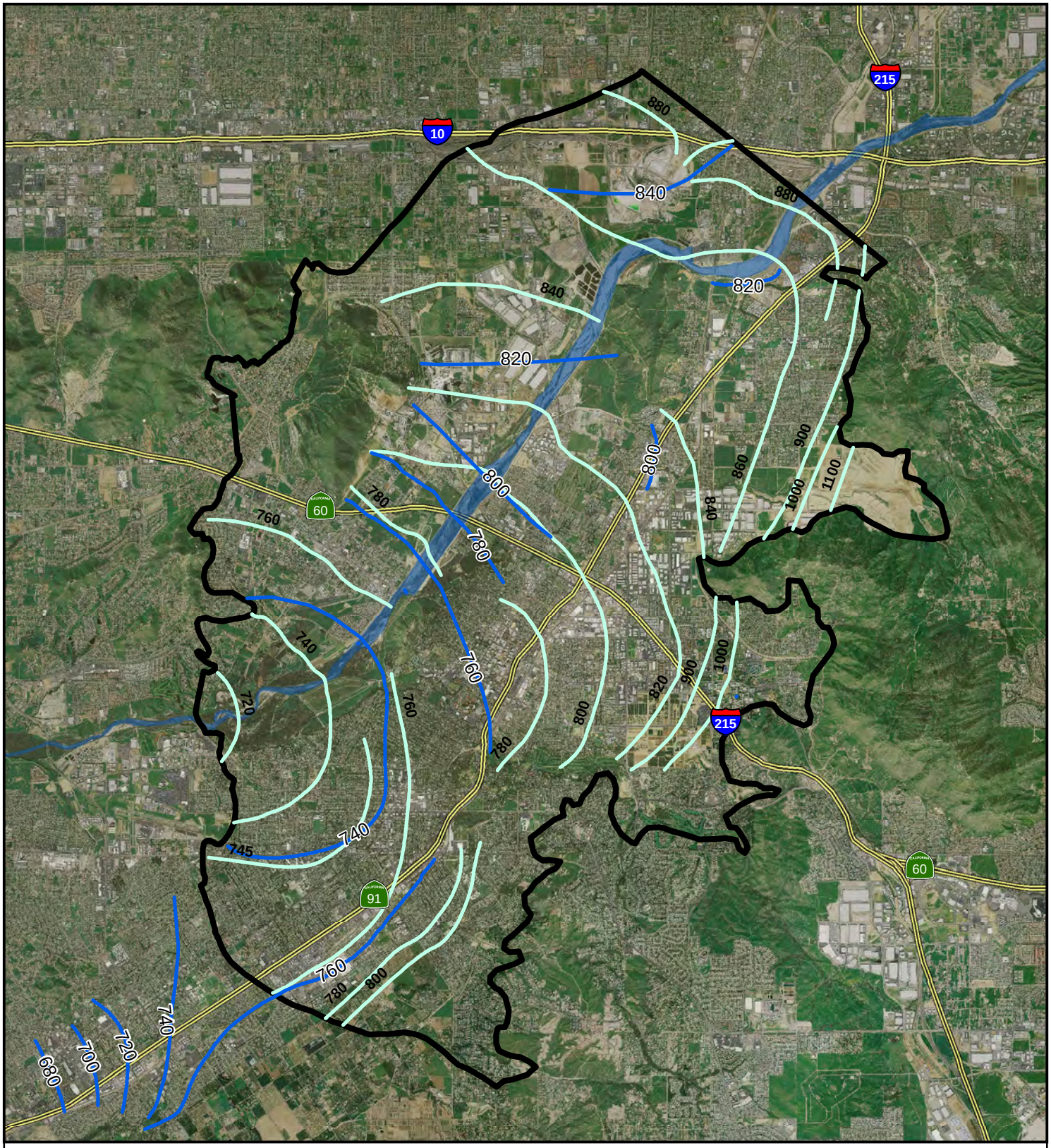
CITY OF RIVERSIDE

Fall 2009 Groundwater Levels

Riverside Basin Groundwater Management Plan

2011

Figure 2.5



Legend

- Plan Area
- Highway
- Santa Ana River
- Fall 2009 Water Levels (ft MSL)*
- January 1933 Water Levels (ft MSL)*

*Fall 2009 Groundwater Elevation based on Western and Watermaster Support Services database, 2010
Jaunary 1933 Groundwater Elevation from Eckis, 1934

N W E S

0 0.5 1 2 Miles

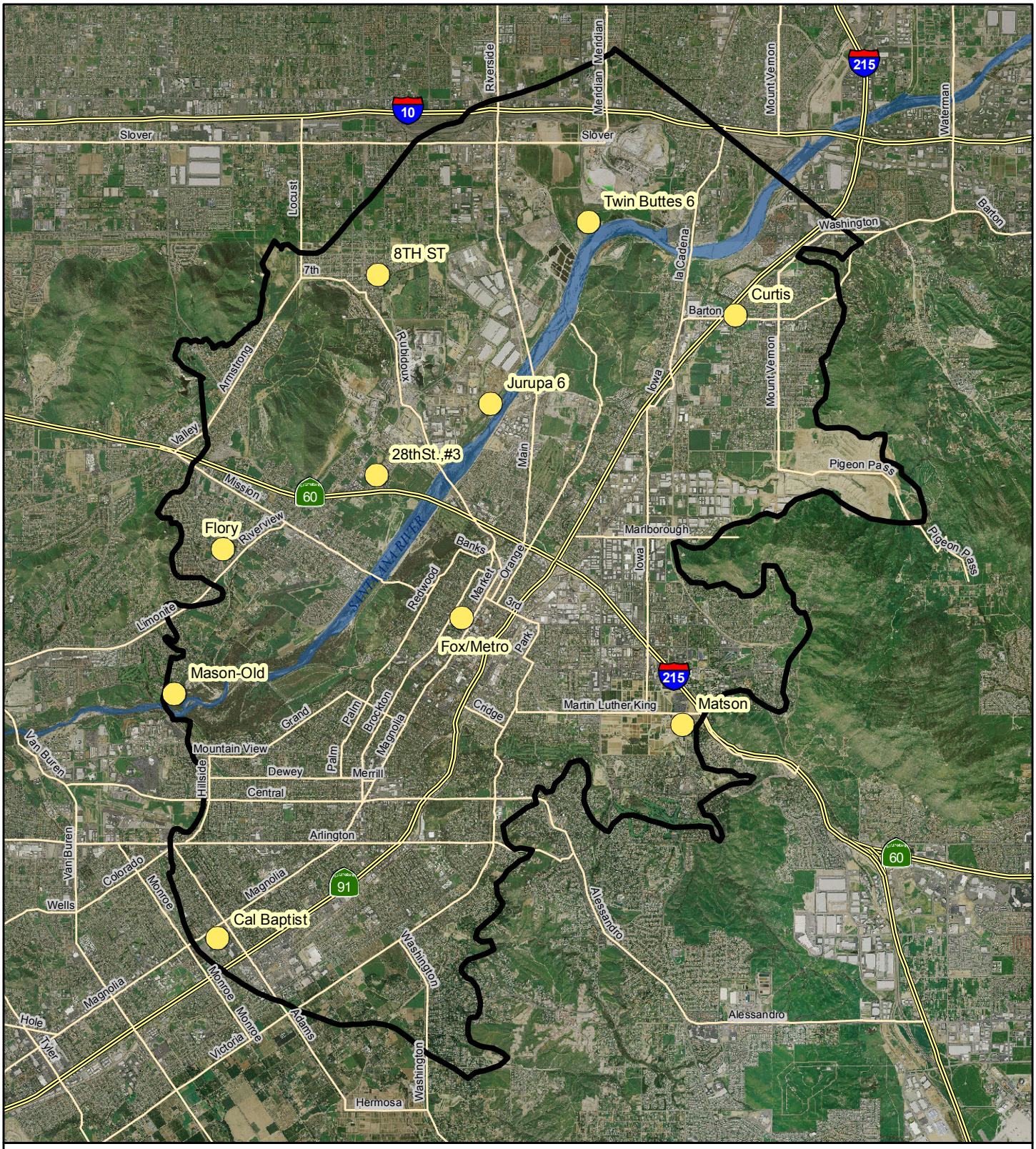
CITY OF RIVERSIDE

Comparison of Recent and Historical Groundwater Elevations

Riverside Basin Groundwater Management Plan

2011

Figure 2.6



Legend

- Plan Area
- Highways
- Roads
- Selected Wells

N W E S

0 0.5 1 2 Miles

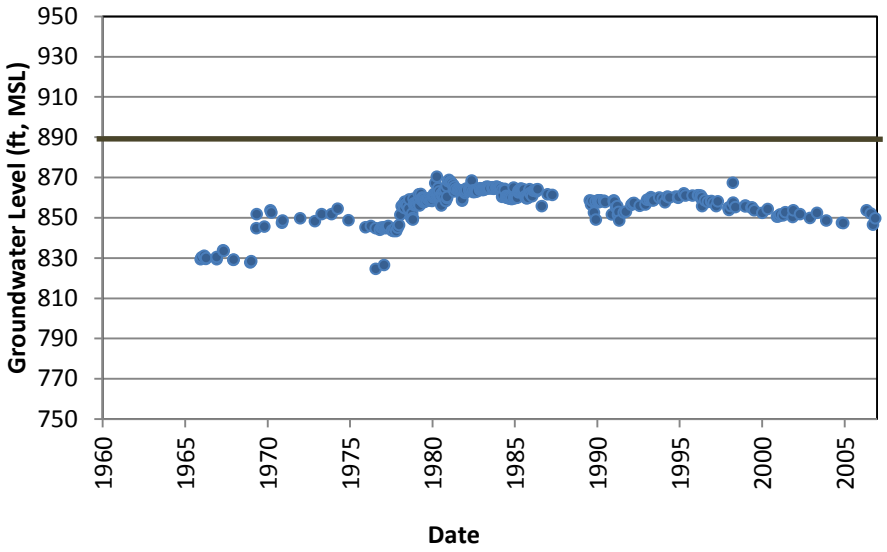
CITY OF RIVERSIDE

Hydrograph Locations

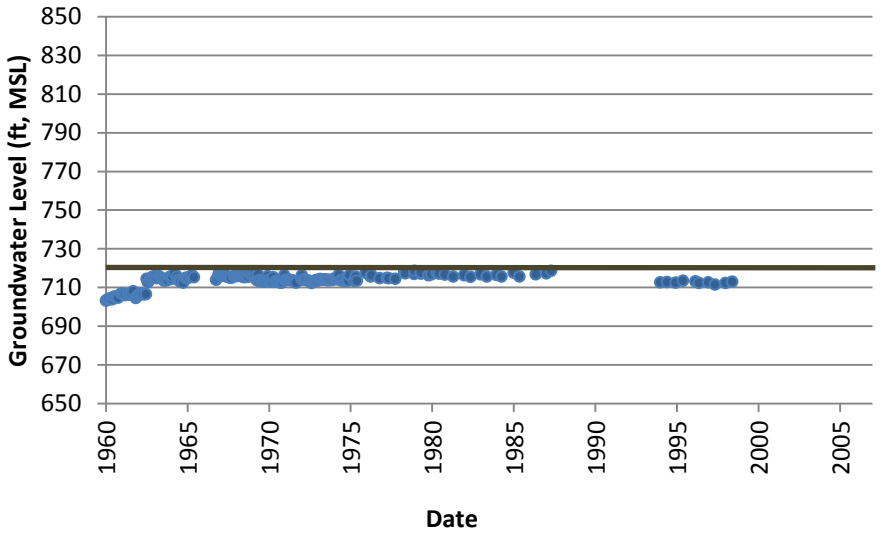
Riverside Basin Groundwater Management Plan

2011

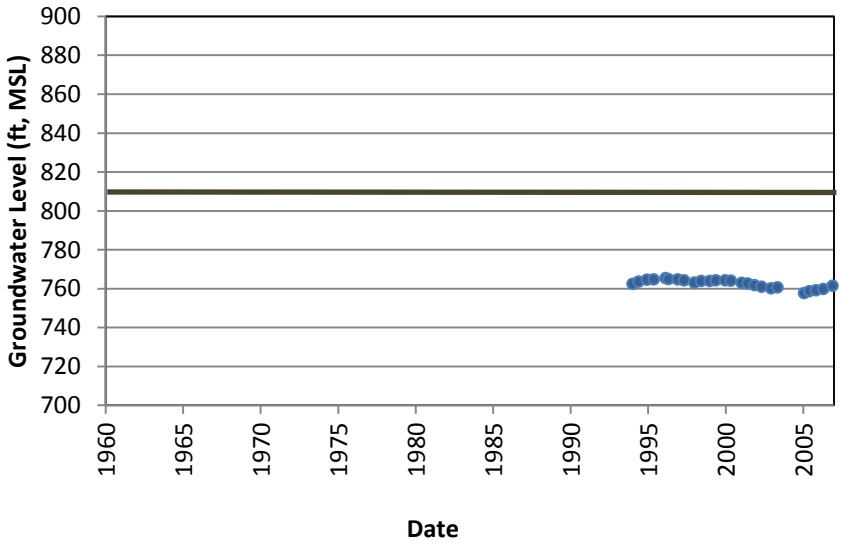
Figure 2.7



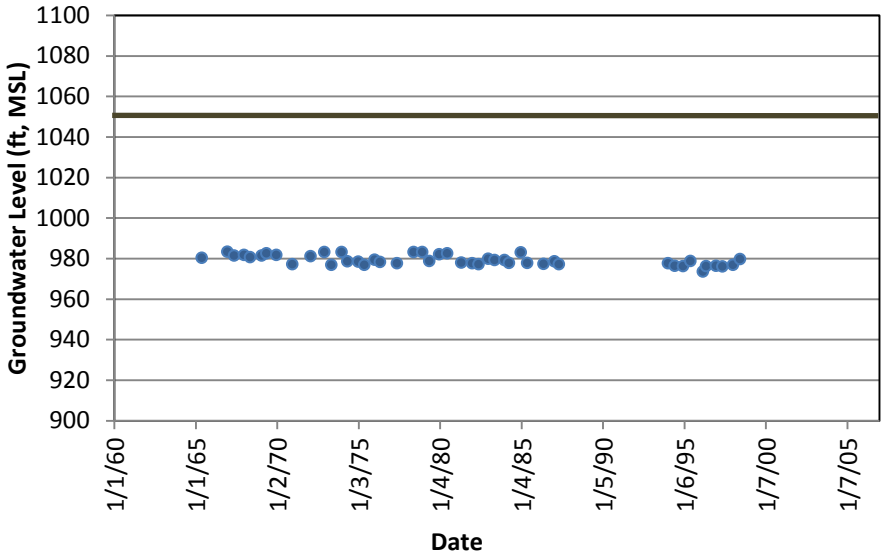
Twin Buttes



Mason Old



Cal Baptist



Matson

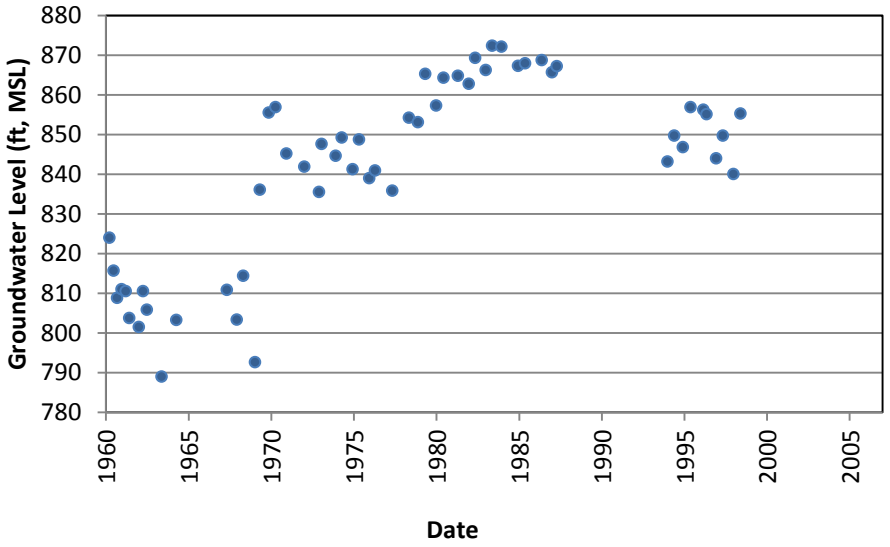
Ground Sufrace Elevation is Approximate, Based on USGS Digital Elevation Model

Hydrographs at Selected Wells

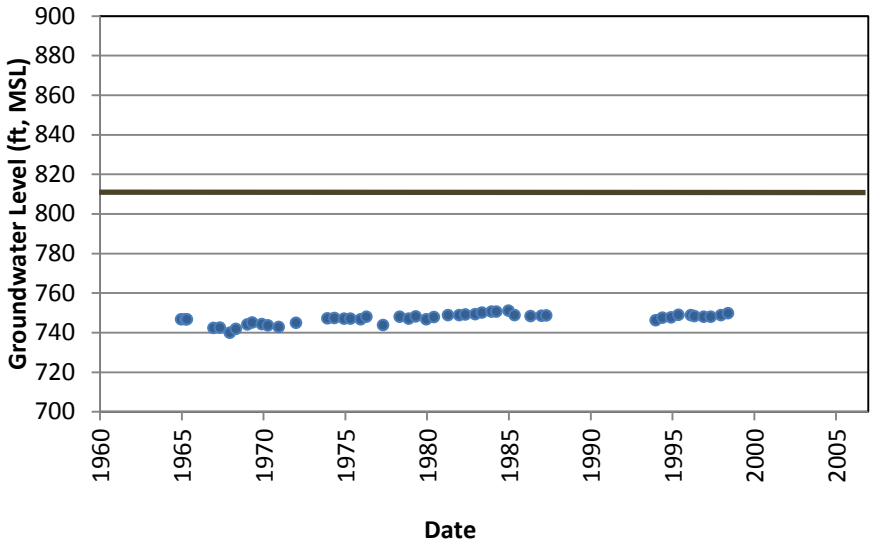
Riverside Basin Groundwater Management Plan

2011

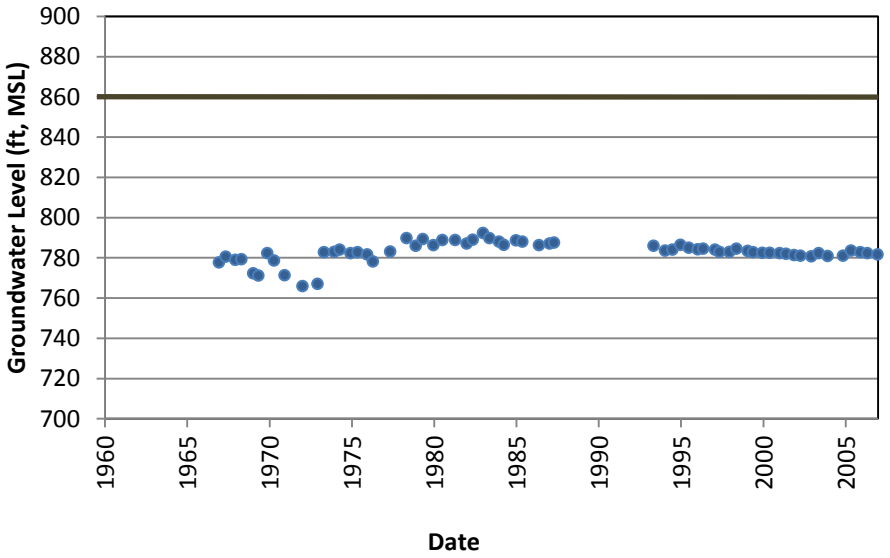
Figure 2.8



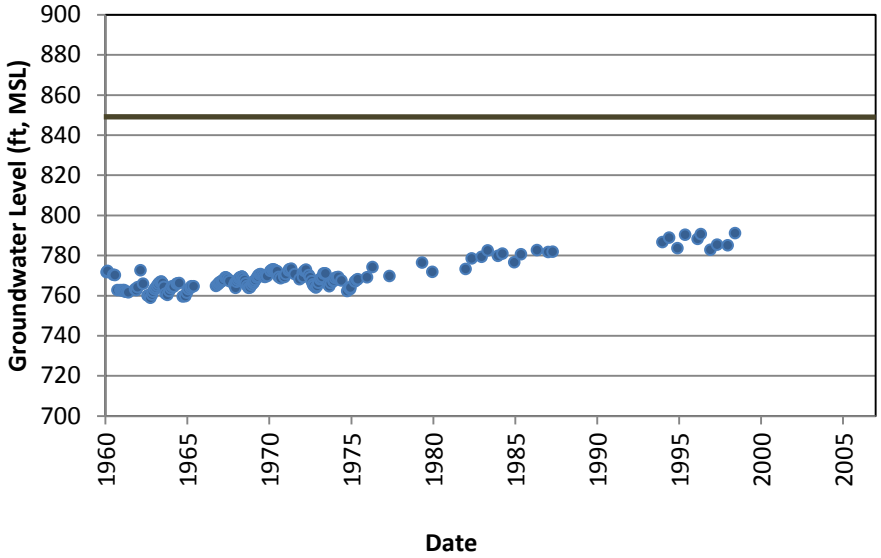
Curtis (Ground Surface at Curtis = Approximatly 990 ft, MSL)



Flory



28th St.



Fox/Metro

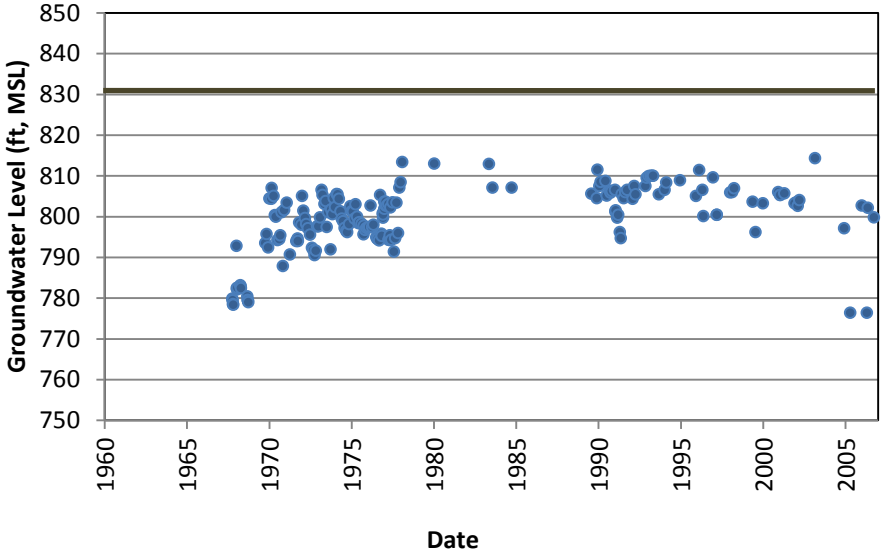
Ground Sufrace Elevation is Approximate, Based on USGS Digital Elevation Model

Hydrographs at Selected Wells

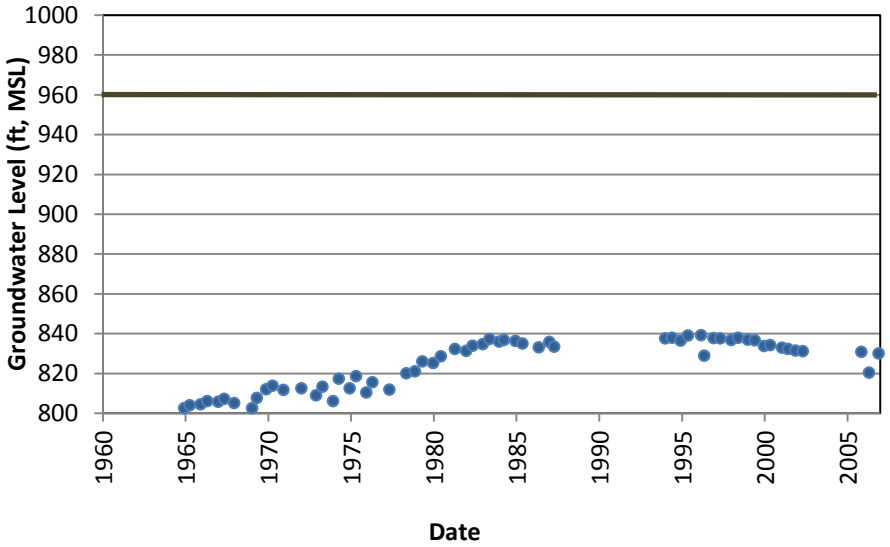
Riverside Basin Groundwater Management Plan

2011

Figure 2.8



Jurupa



8th St.

Ground Sufrace Elevation is Approximate, Based on USGS Digital Elevation Model

Hydrographs at Selected Wells

Riverside Basin Groundwater Management Plan

2011

Figure 2.8

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2.3.6.1 TDS and Nitrogen

The Riverside Basin lies within the jurisdiction of the RWQCB, and the RWQCB's Basin Plan establishes the legal beneficial use designations and the standards to protect these uses. The Basin Plan incorporates a TDS and nitrogen management plan for the Santa Ana Region.

Within the Santa Ana Watershed, which includes the Riverside Basin, a statistical method has been developed to use nitrate (as Nitrogen (N)) and TDS to evaluate water quality, to compare sub-basin concentrations, and to trigger management actions (RWQCB, 2004; Wildermuth, 2000, 2005, 2008, 2011). Point statistics were used to show the following:

1. Historical ambient water quality conditions as represented by the 1954-1973 time period
2. 1997 current ambient water quality conditions as represented by the 1978-1997 time period
3. 2003 current ambient water quality conditions as represented by the 1984-2003 time period
4. 2006 current ambient water quality conditions as represented by the 1987-2006 time period
5. 2009 current ambient water quality conditions as represented by the 1990-2009 time period

These point statistics were developed for six management zones defined in the Basin Plan as Riverside A through Riverside F. The boundaries were designed to provide "hydrologically-distinct groundwater units from a groundwater flow and water quality perspective. As such, lines delineating management zones were placed along impermeable barriers to groundwater flow, at bedrock constrictions, and between distinct flow systems" (Wildermuth, 2000). Several boundaries, such as the boundary between Riverside D and Arlington Basin, are based on groundwater flow divides or groundwater quality conditions that are not fixed and may migrate due to recharge and extraction operations in the area. The locations of the six management zones are shown with the water quality summaries in Figure 2.9 and Figure 2.10.

Summaries of the data are shown in Table 2.4, Figure 2.9, and Figure 2.10 and indicate nitrate (as N) levels exceed the maximum contaminant level (MCL) of 10 milligrams per liter (mg/L) in one or more time period for Riverside C, D, E, and F. TDS exceeds the recommended secondary MCL (SMCL) of 500 mg/L in one or more time period in Riverside C, D, E, and F. The upper SMCL for TDS of 1,000 mg/L was not exceeded by the point statistics for any of the Riverside management zones during the analyzed time periods. Supply sources exceeding MCLs require treatment or blending prior to use as a drinking water supply. Basin Plan objectives are exceeded in one or more time periods for nitrate (as N) for Riverside B, C, D, E, and F and for TDS for Riverside B and C.

Table 2.4
Historical (1954-1973), 1997 Current (1978-1997), 2003 Current (1984-2003), 2006 Current (1987-2006), and 2009 Current (1990-2009) Ambient Nitrate as N and TDS Concentrations (mg/L)

Management Zone	Nitrate as N [1]						TDS[2]					
	Basin Plan Objective[3]	Historical	1997 Current	2003 Current	2006 Current	2009 Current	Basin Plan Objective[4]	Historical	1997 Current	2003 Current	2006 Current	2009 Current
Riverside A	6.2	6.2	4.4	4.9	4.9	5.2	560	560	440	440	440	430
Riverside B	7.6	7.6	**8.0**	**7.8**	**8.3**	**8.4**	290	289	**320**	**310**	**340**	**340**
Riverside C	8.3	8.3	**15.5**	**15.3**	**15.3**	**14.8**	680	684	**760**	**750**	**740**	**740**
Riverside D	10.0	**19.5**	**?**	**?**	**?**	**?**	810	812	**?**	**?**	**?**	**?**
Riverside E	10.0	**13.3**	**14.8**	**15.4**	**15.3**	**15.2**	720	721	720	700	710	700
Riverside F	9.5	**12.1**	9.5	**10.6**	**10.3**	**10.6**	660	665	580	570	570	570

? = Not enough data to estimate concentrations; management zone is presumed to have no assimilative capacity. If assimilative capacity is demonstrated by an existing or proposed discharger, that discharge would be regulated accordingly.
Source:
[1] Wildermuth, 2011. (Table 3-2)
[2] Wildermuth, 2011. (Table 3-1)
[3] RWQCB, 2011 (Table 5-4)
[4] RWQCB, 2011 (Table 5-3)

The RWQCB used these point statistics and water quality objectives to develop estimates of assimilative capacity. Areas with assimilative capacity can accept waters with constituent concentrations higher than those in the receiving waters because natural processes such as recharge and dilution allow the water quality objectives to continue to be met. The most recent computations indicate that there is assimilative capacity for TDS in Riverside A (130 mg/L), Riverside E (20 mg/L), and Riverside F (90 mg/L). For nitrate, only Riverside A (1.0 mg/L) has assimilative capacity (Wildermuth, 2011).

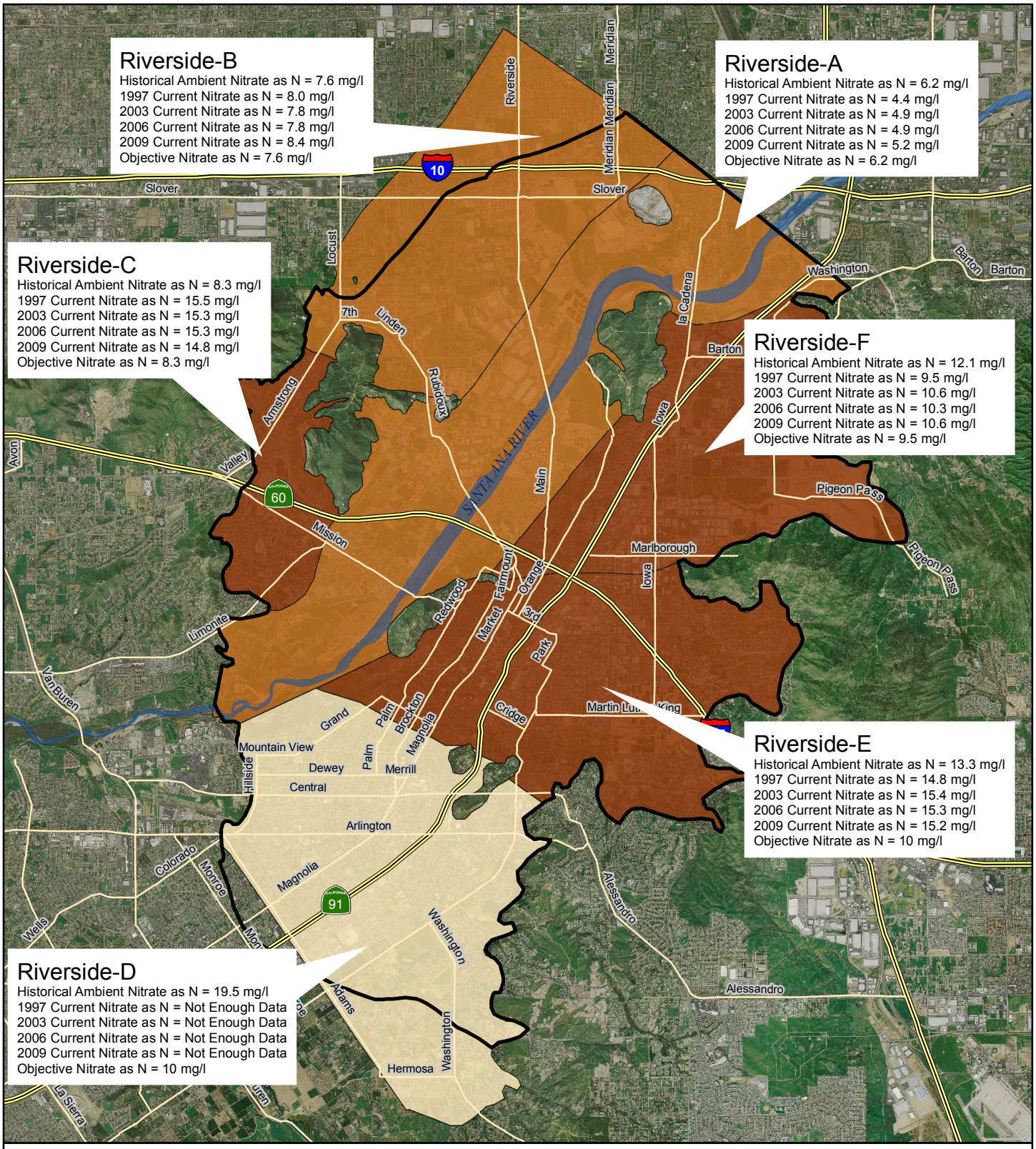
Table 2.5 shows the changes over the 36-year period between the historical and 2009 Current periods. For nitrate as N, Riverside C and E show concentration increases of 6.5 and 1.9 mg/L, respectively; Riverside A and F show a decline of 1.0 and 1.5 mg/L, respectively; and Riverside B shows a smaller change of 0.8 mg/L. For TDS, Riverside B and C show concentration increases of 51 and 56 mg/L, respectively; Riverside A and F show a decline of 130 and 95 mg/L, respectively; and Riverside E shows a smaller decline of 21 mg/L. It should be noted that changes between these time periods are a combination of true changes in ambient water quality and artificial changes due to limitations in monitoring data and the estimation technique (Wildermuth, 2005). In the future, as monitoring programs assemble more data, a long-term

record of analytical data at specific wells will better show changes over time at specific locations. Additionally, insufficient data are available to compute statistics for Riverside D.

Table 2.5
Change in Ambient Concentration (mg/L) of Nitrate as N and TDS Between Historical (1954-1973) and 2009 Current (1990-2009) Time Periods

Management Zone	Change in Nitrate as N (mg/L)	Change in TDS (mg/L)
Riverside A	-1.0	-130
Riverside B	0.8	51
Riverside C	6.5	56
Riverside D	n/a	n/a
Riverside E	1.9	-21
Riverside F	-1.5	-95

In addition to the ambient water quality concerns, contaminated groundwater from point sources can quickly remove wells from service and thus requires close coordination with regulatory agencies such as the United States Environmental Protection Agency (EPA), the California Department of Toxic Substances Control (DTSC), and the RWQCB. Summaries of point sources in the Plan Area are presented below for selected specific contaminants (volatile organic compounds [VOCs], perchlorate, and DBCP) and for specific locations.



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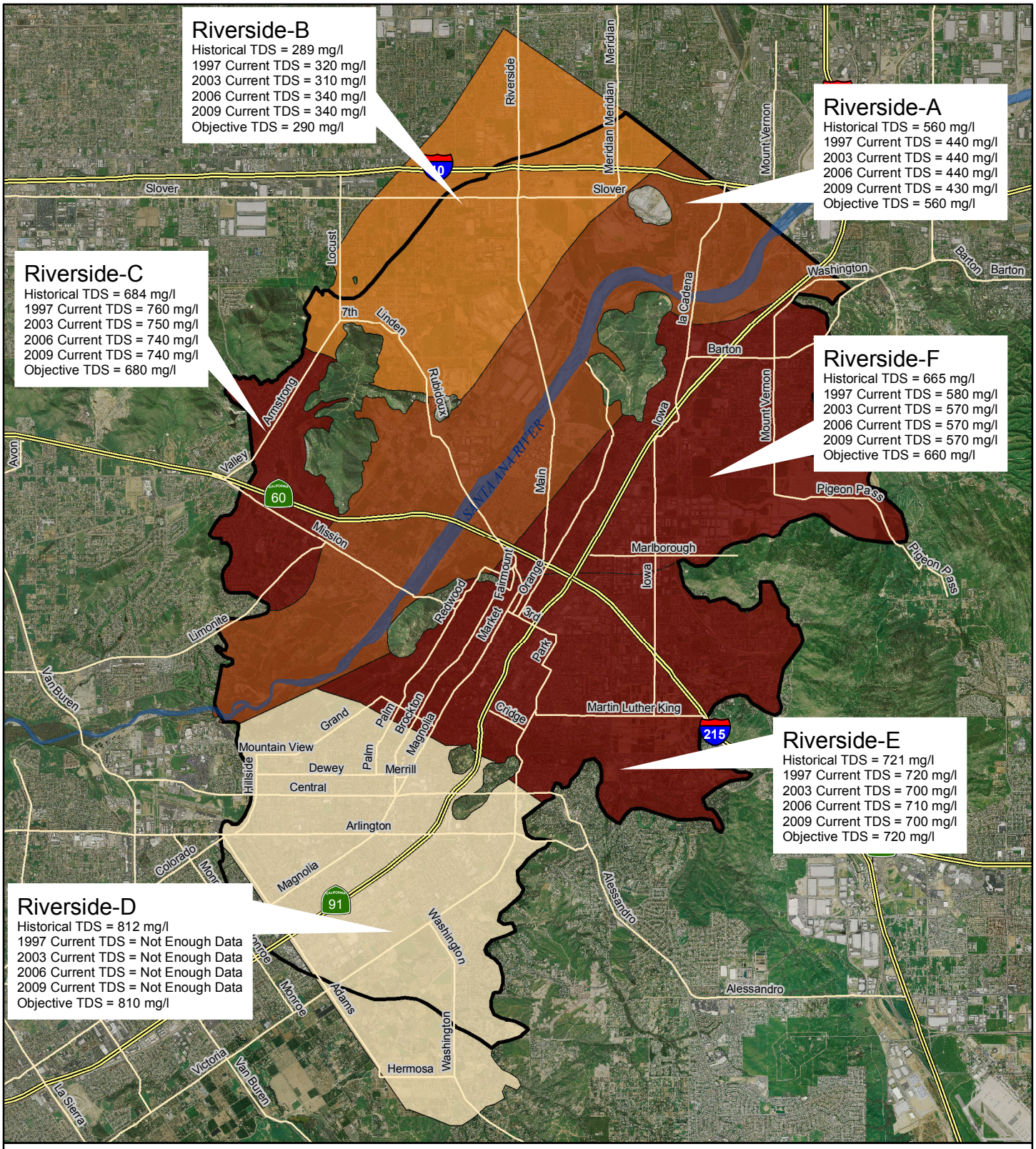
Management Zone Water Quality Conditions - Nitrate as Nitrogen

Riverside Basin Groundwater Management Plan

2011

Figure 2.9



CITY OF RIVERSIDE

Management Zone Water Quality Conditions - Total Dissolved Solids

Riverside Basin Groundwater Management Plan

2011

Figure 2.10

2.3.6.2 Volatile Organic Compounds

Volatile organic compounds (VOCs), including trichloroethylene (TCE) and tetrachloroethylene (PCE), have been detected in three wells in the Riverside Basin above the MCL of 5 parts per billion (ppb) (see Table 2.6). The wells, Eleventh Street, Mulberry, and Fill, are all located in a small area near downtown Riverside, east of the 91 Freeway in Management Zone E. The Mulberry and Eleventh Street Wells were sampled most recently in December 2005, and the Fill Well was sampled in May 2009. Wells upgradient (First Street Well) and downgradient (Olivewood 3) of this well cluster are below the detection limit of 0.5 ppb for both TCE and PCE, and the VOC source is unknown.

Table 2.6
TCE and PCE Concentrations in Downtown Well Cluster

Well	TCE (ppb)	PCE (ppb)
Mulberry	15	2.5
Eleventh Street	200	38
Fill	25	6.1

Source: RPU, pers. comm., October 29, 2009.

2.3.6.3 Perchlorate

Perchlorates are salts derived from perchloric acid, and can occur naturally and through manufacturing of rocket fuel, fireworks, explosives, and airbags. Perchlorate affects human health by interfering with iodide absorption into the thyroid gland which can affect metabolism and growth development in children. In October 2007, DPH established a MCL for perchlorate in drinking water of 6 micrograms per liter (µg/L) and in 2011 the Office of Environmental Health Hazard Assessment proposed lowering the Public Health Goal for perchlorate from 6 µg/L to 1 µg/L (DPH, 2011).

High levels of perchlorate in excess of the MCL have been detected in the Colton groundwater basin. Pursuant to an Administrative Settlement and Order by the RWQCB, perchlorate was monitored for a 160-acre parcel study area within the Rialto Groundwater Management Zone and discovered to be far above the MCL. A variety of potential sources of perchlorate existed within the study area including the following:

- Agricultural activities including citrus orchards suspected to have been fertilized with large quantities of Chilean sodium nitrate, which contains perchlorate.
- Various businesses including munitions and missile manufacturers and pyrotechnic companies were involved in on-site disposal of perchlorate from the 1940s through the 1960s.

RPU has established a limited perchlorate sampling program downgradient of the Colton plume to monitor perchlorate in groundwater approaching RPU wells. The initial results of a preliminary sampling program indicate that perchlorate levels near the northernmost RPU wells do not exceed the MCL. However, perchlorate levels above MCL have been detected northwest of downtown Colton, and the regional groundwater gradient indicates the plume is migrating south and southeast towards the RPU Flume Tract wells that supply water to the JW North Treatment Plant (RPU, pers. comm., October 29, 2009).

Because of the variability in the aquifer characteristics (lithology, hydraulic conductivity, etc.) in the Colton and Riverside basins, a precise groundwater velocity for the plume has not been determined; however, an estimation of the groundwater velocity ranging from 2 to 4 feet per day in the south Colton Basin has been cited in previous consultant's studies (County of San Bernardino, 2008). The velocity between the Colton plume and RPU wells is anticipated to be at the high end of this range, and possibly higher, due to the presence of highly permeable recent river deposits adjacent to the main channel of the Santa Ana River and near the Flume Tract wells.

2.3.6.4 Dibromochloropropane

Dibromochloropropane was used extensively as a fumigant to control nematodes attacking roots of grape vines and deciduous fruit trees from the mid-1950s to the late 1970s. Use of DBCP was banned by the State of California in 1977 due to potential carcinogenic and infertility risks. DBCP is a persistent chemical that does not degrade readily. With continued irrigation and/or precipitation, the residual DBCP in the soil migrates deeper into the vadose zone until it reaches groundwater.

Groundwater sampling and analyses for selected wells in the Riverside Basin from 2008 through 2009 have detected DBCP above the MCL of 0.2 ppb in 10 wells (potable, non-potable, and monitoring wells). The wells are concentrated in the eastern part of the Riverside Basin near the center of Riverside F and near the 91 Freeway in Riverside E. DBCP concentrations in these wells ranged from 0.22 to 2.2 ppb for this period. The highest concentration (2.2 ppb) was detected in the Center Street Well in Highgrove and is the easternmost of the 10 wells.

2.3.6.5 Contaminated Sites

Based on a search of the DTSC Envirostor database, the following sites have been identified as federal, state, or voluntary cleanup sites potentially affecting the aquifer system:

- Alark Hard Chrome
  - APN: Not specified
  - Envirostor ID: 33340002
  - Potential contaminants of concern: Metals, TCE
  - Lead agency: EPA
  - Ongoing remediation and monitoring

Alark Hard Chrome was a chrome plating operation on Main Street in Riverside. It operated from 1971 until 1985. In 1982, the Riverside County Health Department inspected the site and discovered soil contamination. The Alark potentially responsible parties (PRPs) were ordered to investigate the full extent of contamination at the site. The County District Attorney Office permanently closed Alark's operations in 1985. In 1990, DTSC took over the site investigation. In December 2000, the Alark facility was placed on the EPA Superfund National Priorities List (EPA, 2011).

Between 1991 and 1995, DTSC installed 10 groundwater monitoring wells in the vicinity of the Alark facility to monitor chromium in the groundwater. In 2001, EPA conducted groundwater sampling and the results were consistent with the 1995 DTSC groundwater investigation: High chromium concentrations remained in monitoring wells closest to the site. The California MCL for hexavalent chromium (Cr+6) in drinking water is 50 µg/L. This was exceeded in five of the ten wells at the site, with one well containing 17,300 µg/L Cr+6.

Since 2001, EPA has been conducting a remedial investigation to determine the extent of soil and groundwater contamination at the Alark Site. In August 2007, EPA completed field work for the remedial investigation with the installation of one additional monitoring well to define the groundwater contaminant plume southeast of the site. This completed definition of the groundwater contaminant plume in all directions. The EPA completed the Remedial Investigation Report in December 2009.

In October 2007, EPA began a treatability study to evaluate the effectiveness of in-situ treatment of Cr+6 in the vadose zone and groundwater at the Alark Site. The in-situ treatment method selected uses a calcium polysulfide solution to reduce Cr+6 to trivalent chromium (Cr+3), which is much less toxic than Cr+6 and is also much less soluble in groundwater. Cr+3 is stable in the soil and will not convert back to Cr+6 in the normal soil environment. The treatability study was completed in December 2007 and a final Treatability Study Report was issued in April 2009. The next step is for the EPA to begin the feasibility study. The initial step will be an additional field investigation to fill data gaps identified in the Remedial Investigation and Treatability Study report (EPA, 2011).

- So Cal Gas/Colton 1 (Fogg St) MGP
  - APN: Not specified
  - Envirostor ID: 36490107
  - Potential contaminants of concern: PAHs, semi-volatile organic compounds (SVOCs), total petroleum hydrocarbons as diesel
  - Lead agency: DTSC
  - Ongoing monitoring
- University Of California Riverside
  - APN: 253-090-008-5
  - Envirostor ID: 33890001
  - Potential contaminants of concern: Organichlorine pesticides, chlorinated herbicides, solvents, hydrocarbons, and polychlorinated biphenyls (PCBs)
  - Lead agency: DTSC
  - Deed restrictions in place
  - Ongoing monitoring

In addition to these local sites, larger regional plumes must be monitored. This includes the following Rialto-area perchlorate plumes:

- Goodrich/Black & Decker Site
- Mid-Valley Sanitary Landfill
- Former Rialto Ammunition Storage Point Bunker Complex
- Stonehurst Site

Other contamination issues, as discussed earlier, include DBCP in groundwater, which led to financial settlements with Dow Chemical Corp., Shell Oil, and Occidental Chemical Corporation; and TCE in groundwater, which led to financial settlements with Lockheed Martin Corporation.

As with all urban areas in the state, numerous Leaking Underground Fuel Tanks (LUFTs) and Spills Leaks Investigation and Cleanup (SLICs) sites are present in the Riverside Basin and are being monitored and/or remediated under the regulatory lead of the RWQCB or the local oversight program. LUFTs are typically at gas stations, while SLICs have a variety of sources, all of which involve hazardous wastes that have impacted soil and/or groundwater.

2.3.7 DESALTER INFRASTRUCTURE

There are no desalter wells in the Riverside Basin, however, desalter facilities could be installed to better manage and utilize lower quality groundwater in southern portions of the basin. The Inland Empire Brine Line (Brine Line), a regional brine line designed to convey 30 million gallons per day (MGD) of non-reclaimable wastewater from the upper Santa Ana River Basin to the ocean for disposal after treatment, has two branches near the Riverside Basin. The non-

reclaimable wastewater consists of desalter concentrate and industrial wastewater. One Brine Line reach (Reach IV B) serves existing desalters in the Arlington Basin. Another reach (Reach IV D and E) roughly follows the Santa Ana River in the northern portion of the basin and was completed in 1995 to serve the City of San Bernardino Wastewater Treatment Plant. Proximity to the Brine Line provides additional options for future desalter projects.

2.3.8 GROUNDWATER/SURFACE WATER INTERACTION

Groundwater and surface water in the Plan Area are closely linked. Water from the Santa Ana River, as well as from other smaller watercourses, percolates through permeable river channel deposits and contributes to the basin's groundwater supply. Modeling efforts (see *Riverside-Arlington Groundwater Flow Model (RAGFM), Model Development and Scenarios* [WRIME, 2011]) estimate an average net amount of approximately 36,000 AFY of water is recharged to the Riverside Basin groundwater system from the Santa Ana River under current conditions. In addition to changes in groundwater volume, water quality is also impacted as the Santa Ana River recharges the groundwater in the upper reaches of the river and as the groundwater discharges to the river near Riverside Narrows. Most of this recharge is high quality water during periods of high flow on the Santa Ana River. Recharge during low flow conditions is largely from treated wastewater returned to the Santa Ana River. The close interaction of surface water and groundwater in the area is well known and has been incorporated into past groundwater and surface water agreements and regulations.

2.3.9 SUBSIDENCE AND LIQUEFACTION

Subsidence and liquefaction are both influenced by groundwater levels and their interaction with aquifer materials, such as sands, silts, and clays. High groundwater levels can contribute to liquefaction potential while both increases and decreases in groundwater levels can contribute to subsidence. Land subsidence here refers to the lowering of the Earth's surface as a result of groundwater level changes, not tectonic changes.

Aquifers, particularly the fine-grained materials within or between the aquifers, are compressible. While most available water in an aquifer is stored between larger grained soil particles, such as sands and gravels, smaller grained soil particles such as clays also hold water when saturated. If groundwater levels decrease as a result of pumping or other causes, water may be released from beds of clay or silt around the coarser materials that are the primary source of water in the aquifer. The release of water from the beds of clay and silt reduces water pressure, resulting in a loss of support for the clay and silt beds. Unlike sands and other coarser materials, clays are compressible. Because these beds are compressible, they compact (become thinner), and the effects are seen as subsidence, or a lowering of the land surface (Leake, 2004). Whether or not subsidence through compression occurs in an area depends on groundwater

levels (groundwater levels must decline) and on materials (sufficient compressible clays and silts must be present).

Rising groundwater levels can also cause subsidence due to collapsible soil hydroconsolidation. Rapid collapse of up to 15 percent of the soil thickness can occur from a total loss of cohesion as soils saturate for the first time. Alluvial silts in semi-arid basins are most susceptible to hydroconsolidation (Waltham, 2002). In the Riverside Basin, soils most susceptible to hydroconsolidation are present at the base of the mountains, where recent alluvial fan and wash sediments have been deposited during rapid runoff events. In addition, some windblown sands may be vulnerable to collapse and hydroconsolidation. Typically, differential settlement of manmade structures may occur when lawns or plantings are heavily irrigated in close proximity to a structure's foundation (Riverside, County of, 2003).

Much of the Riverside Basin is considered susceptible to subsidence (Riverside, County of, 2003; San Bernardino, City of, 2005), although no measurements of historical subsidence are available and no instances of damage could be identified within the basin. Groundwater management within historical elevation ranges can minimize potential impact of future subsidence.

The Plan Area also has potential for liquefaction, where earthquake-induced shaking can cause a loss of soil strength, resulting in the inability of soils to support structures. This can occur in saturated soils where the shaking causes water pressure to increase to the point where soil particles move easily within the soil-water matrix. Conditions in the Plan Area are most conducive to liquefaction southwest of Jackson Street and close to the hills surrounding the basin (Riverside, City of, 2007). High groundwater levels, along with appropriate soil conditions (sands or silts of uniform grain sizes), contribute to the risk of earthquake-induced liquefaction. Limiting high groundwater levels can help reduce risks of liquefaction.

2.3.10 GROUNDWATER MONITORING

Groundwater monitoring activities in the Riverside Basin include monitoring groundwater levels, groundwater production, and groundwater quality.

2.3.10.1 Groundwater Level Monitoring

2.3.10.1.1 Historical and Existing Programs

Groundwater level monitoring in the Riverside Basin has been an ongoing activity since the mid-1900s. Valley District started the original basin-wide water level measuring program in 1964. Early monitoring efforts were supported by DWR, however, in the late 1970s, DWR stopped measuring most groundwater levels due to budgetary constraints and suggested local agencies assume that task. By 1989, DWR stopped all its groundwater level measurements and only a few water districts had the personnel to conduct groundwater monitoring.

Today, groundwater level databases are maintained by SAWPA and Western. SAWPA first began developing its database in 1993, with the original early-1900s data being transcribed from paper notebooks and microfiche. SAWPA gathered as much monitoring and well measurement data as possible and created a pair of Microsoft Access databases that are updated on a regular basis, with new data entered directly into the databases. The two SAWPA databases have recently been combined into one database with all data from the Basin Monitoring Program Task Force, including ambient water quality updates, Total Maximum Daily Load (TMDL) task forces, and groundwater well quality and levels. The details of the two SAWPA databases are as follows:

- Santa Ana Basin Relational Information Network Application (SABRINA) database - Maintained by SAWPA, this database contains monitoring data for 10,000 wells in the Santa Ana River Watershed and surrounding areas. Groundwater level data are available from 1904 to 2003. The SABRINA database is used to share groundwater monitoring data between agencies for groundwater management and geographic information system analysis.
- Santa Ana Watershed Data Management System (SAWDMS) – Maintained by SAWPA, this database covers most of the Santa Ana River Watershed with groundwater level data available from the 1910 to present. The SAWDMS contains over 765,000 records related to approximately 6,600 wells in the Santa Ana Watershed and appurtenant groundwater basins. The SAWDMS is used primarily to reflect and store the triennial reports on water quality and water levels (Cozad, 1998; S. Mains, pers. comm., February 4, 2009; M. Norton, pers. comm, October 12, 2011).

Western also maintains a database of groundwater levels through its Cooperative Well Measuring Program, which began in 1992. The Cooperative Well Measuring Program Database covers 74 cooperating agencies and firms with nearly 4,500 wells in the Upper Santa Ana, San Jacinto, and Santa Margarita watersheds. Groundwater level data in this database are available from 1993 to present and include fall and spring measurements. Data are available in various other formats under the Cooperative Well Measuring Program from 1964 to present.

2.3.10.1.2 California Statewide Groundwater Elevation Monitoring

The California Statewide Groundwater Elevation Monitoring (CASGEM) program is a new monitoring program being implemented by DWR as part of SB x7 6, the comprehensive package on water enacted by the California Legislature in November 2009. RPU anticipates coordinating with other agencies in the Riverside Basin to comply with SB x7 6. Western has been identified as the reporting agency for the Riverside Basin. Western will work with the agencies in the Riverside Basin to develop a monitoring plan and to assemble and report the data to DWR.

RPU has been actively collecting water level data for several years from numerous monitoring wells in the Riverside-Arlington Groundwater Subbasin, with a significant number of wells in Riverside North and South and an expanding network in Arlington Basin to the south. These are suitable for use in the CASGEM program. The network currently has 31 monitoring wells and additional wells are being added to the network periodically. The wells are inactive former public supply (now classified as monitoring wells by DPH), agricultural, or monitoring wells and were selected based on proximity to actively pumping wells, site access, and wellhead security. Non-secured wellheads have been retrofitted with locking lids and, where necessary, access agreements with the property owner have been obtained. The wells are equipped with pressure transducers that record water levels daily. Manual water level measurements are taken at a surveyed reference point near the top of each well casing when the transducers are set as well as when periodic data downloads are performed to confirm data accuracy.

2.3.10.2 Groundwater Production Monitoring

Groundwater production in the Riverside Basin is monitored by the Watermaster. Since 1969, the Watermaster has annually reported groundwater extractions from the San Bernardino, Colton, and Riverside basin areas and the distribution of such extractions to various service areas to comply with the 1969 Western Judgment. (Watermaster, 2010b).

2.3.10.3 Groundwater Quality Monitoring

Groundwater quality is monitored to meet DPH's requirements specified in Title 22 of the California Code of Regulations. These requirements apply to active municipal productions wells.

A significant ambient groundwater quality reporting program for nitrate as N and TDS was developed and is maintained by SAWPA. The program compiles groundwater quality data and develops point statistics for the six defined management zones in the Riverside Basin (see Figure 1.8). The RWQCB's Basin Plan incorporates the ambient water quality monitoring program, with objectives defined for each management zone.

The Riverside Basin is also part of the joint USGS/California State Water Resources Control Board (SWRCB) Groundwater Ambient Monitoring and Assessment (GAMA) Santa Ana Unit study. The Riverside, Arlington, and Temescal basins form one of the six major study units analyzed in the study. Approximately 120 wells were sampled in late 2006 for the study. A data series report was released in 2009 to compile the water quality data collected by the USGS (Kent and Belitz, 2009). The data series report was followed by the release of a Fact Sheet (Kent and Belitz, 2012a) and a Scientific Investigations Report (Kent and Belitz, 2012b).

2.3.11 SUBSIDENCE MONITORING

Due to the lack of historical instances of damage from subsidence, there is no active subsidence monitoring program.

2.4 IMPORTED WATER

Imported water in the Riverside Basin is supplied by Western and Valley District, which are both wholesale purchasers of imported water.

Western has contractual rights to imported water from Metropolitan. RPU historically has purchased small quantities of treated imported surface water from Western to meet peak demand needs in the higher elevations of the RPU service area. Imported water is treated at the Mills Filtration Plant near Western in Riverside. The contractual agreement between RPU and Western is for 30 cubic feet per second of imported water delivered through several service connections. RPU obtained a maximum of 5,493 AF of water through the Mills Connection in 1990. This value applies to the RPU service area as a whole, including the Riverside and Arlington basins (RPU, 2005).

Valley District also imports SWP water as a direct SWP contractor from Metropolitan. West Valley purchases SWP water through Lytle Turnout off the San Gabriel Feeder Pipeline for treatment at their Oliver P. Roemer Water Filtration Facility, and to supply non-potable customers. West Valley has been using SWP water since 1999. Riverside Highland has an agreement with Valley District for 1,000 AFY at a flow rate of no greater than 1,000 gallons per minute from the Base Line Feeder.

Metropolitan uses ozone as the primary disinfectant in its Mills Treatment Plant. The water is also disinfected with chloramines. Chloramines, a combination of chlorine and ammonia, prevent re-growth of potentially harmful bacteria in the water distribution system. The water, sourced from the SWP, is high quality, meeting or exceeding all state and federal standards with an average TDS of 291 parts per million (ppm) and average nitrate of 0.7 ppm (Metropolitan, 2008). Consumer Confidence Reports are included in Appendix C.

2.5 RECYCLED WATER

Wastewater collection in the Riverside Basin is performed by the cities of Colton and Riverside. Colton owns, operates, and maintains a wastewater collection, pumping, and treatment system. The wastewater treatment plant also serves the City of Grand Terrace and unincorporated areas. The Riverside Public Works Department operates a comprehensive wastewater collection, treatment, and disposal system that serves most of the City of Riverside, as well as portions of the sphere of influence area and, under contract, the unincorporated communities served by the Jurupa, Rubidoux, and Edgemont Community Services Districts. The Riverside

Public Works Department also serves the unincorporated community of Highgrove through an agreement with Riverside County. Western is responsible for collection and treatment of wastewater flows only in a small portion of the City of Riverside. Historically, the Riverside Public Works Department and Western have cooperatively determined which agency can best serve an area with water and wastewater services. This arrangement has led to a mixing and matching of service providers. The city's wastewater collection system includes more than 102.7 miles of gravity sewers and 18 wastewater pump stations and serves 280,000 residents of Riverside and other communities (Riverside, City of, 2007).

2.5.1 TREATMENT PLANTS

Wastewater in the basin is treated by the Riverside Regional Water Quality Treatment Plant (RWQTP) and the RIX facility. The RIX facility treats water provided by the Colton Wastewater Reclamation Facility as well as the San Bernardino Margaret H. Chandler Water Reclamation Plant. The City of Rialto Wastewater Treatment Plant also is in the Riverside Basin and discharges to the Santa Ana River within the Riverside Basin.

2.5.1.1 Riverside Regional Water Quality Treatment Plant

The RWQTP at 5950 Acorn Street in Riverside, provides tertiary treatment for sanitary sewer service for 280,000 residents in the City of Riverside and Jurupa, Edgemont, and Rubidoux communities. It consists of two secondary treatment plants, one tertiary treatment plant, and sludge handling facilities. Approximately 50 acres of wetlands were previously used for additional treatment at Hidden Valley Wetlands. Most of the effluent from the plant is discharged to the Santa Ana River, with a limited volume reclaimed for beneficial use. The effluent released to the Santa Ana River is available for groundwater recharge below Prado Dam. Effluent discharged into Reach 3 of the Santa Ana River (below Riverside Narrows) from the RWQTP in water year 2008-2009 was 33,636 AF (Santa Ana River Watermaster, 2010). According to the Orange County Judgment, baseflow in the Santa Ana River must be maintained at 15,250 AFY at Riverside Narrows and 42,000 AFY at Prado Dam (with adjustments based on quality) to meet commitments (*Orange County Water District v City of Chino et al.*, 1969). The tertiary treatment provides high-quality, dechlorinated water for these uses. In 2008, the plant had a capacity of 40 MGD, an average daily flow of 32 MGD, and an average peak flow of 36 MGD. Capacity is not anticipated to be reached before 2025. A planned expansion will allow the facility ultimately to treat 52.2 MGD of wastewater (Riverside, City of, 2007; Jones & Stokes, 2006).

2.5.1.2 Colton Wastewater Reclamation Facility

The Colton Wastewater Reclamation Facility provides secondary treatment of 10 MGD of raw sewage. Effluent is further treated to tertiary standards by the RIX facility.

2.5.1.3 Margaret H. Chandler Water Reclamation Plant

The Margaret H. Chandler Water Reclamation Plant, operated by the San Bernardino Municipal Water Department since 1973, provides secondary treatment of 33 MGD of sewage. Effluent is further treated to tertiary standards by the RIX facility.

2.5.1.4 Rapid Infiltration and Extraction Facility

The RIX facility is an offsite tertiary treatment facility operated jointly by the cities of San Bernardino and Colton. The RIX facility receives approximately 33 MGD of secondary treated wastewater from San Bernardino's Chandler Water Reclamation Plant and Colton's Wastewater Reclamation Facility. Natural biofiltration is employed through the use of percolation basins and ultra-violet disinfection is used to meet California Title 22 tertiary standards in addition to the discharge standards specified in a separate NPDES permit issued to the RIX facility. RIX treated wastewater consistently meets or exceeds required discharge standards and is often superior in quality to effluent produced through conventional tertiary facilities (San Bernardino, City of, 2009).

The following are major components of the RIX facility (San Bernardino, City of, 2005):

- A series of infiltration basins (and associated piping to deliver wastewater to the basins) that filters the influent stream
- An extraction pumping system to withdraw infiltrated water from the local aquifer, delivering the water to the UV disinfection system with disinfection capabilities consistent with Title 22 standards
- A monitoring well system that provides a means for collecting groundwater samples and determining the depth to groundwater
- An outfall pipeline that delivers the disinfected water to the Santa Ana River
- A 7-MGD DynaSand® fluidized bed sand filter

The RIX facility infiltrates treated wastewater and then pumps the treated groundwater back out of the ground through shallow wells. The water is treated further and discharged to the Santa Ana River. Effluent discharged to the Santa Ana River from the RIX facility in water year 2008-2009 was 40,310 AF (Santa Ana River Watermaster, 2010). Some overpumping, or pumping in excess of the amount recharged, occurs to contain the treated wastewater in the subsurface. Historically, this amount has been approximately 20 to 30 percent above the recharged volume, although this percentage is to be reduced in the future (San Bernardino, City of, 2005; San Bernardino, City of, pers. comm., 2009).

2.5.1.5 City of Rialto Wastewater Treatment Plant

The City of Rialto operates a wastewater treatment plant at 501 East Santa Ana Avenue in the Bloomington area of San Bernardino County. The original wastewater treatment plant was constructed in 1956, with numerous additions constructed later.

The wastewater treatment plant consists of five independent treatment plants (Plants No. 1, 2, 3, 4, and 5). The primary and secondary treatment processes in Plants No. 1 through 5 consist of bar screens, aerated grit removal, primary sedimentation, flow equalization, activated sludge process, and secondary clarification. Each treatment plant shares the common headworks, tertiary filtration, chlorination and dechlorination system, UV disinfection, sludge treatment, and digestion system. Sludge treatment includes gravity belt thickeners, belt-press dewatering, and sludge drying. Dewatered sludge is hauled offsite by a private contractor. One primary digester and two secondary digesters are onsite. The gas produced by the digesters powers the gas-driven aeration blowers in Plants No. 1 and 2. The combined total treatment design capacity of Plants No. 1 through 5 is 12.7 MGD.

The treatment plant receives domestic and commercial/industrial wastes generated within the City of Rialto's service area and from portions of the City of Fontana. Rialto discharges tertiary treated wastewater at two nearby locations along Reach 4 of the Santa Ana River (RWQCB, 2001). Effluent discharged to the Santa Ana River from the Rialto facility in water year 2008-2009 was 6,724 AF (Santa Ana River Watermaster, 2010).

2.5.2 RECYCLED WATER INFRASTRUCTURE AND USERS

The City of Riverside operates a small recycled water system composed of 8-inch and 12-inch diameter distribution mains, including recycled water pipelines in Van Buren Boulevard and Doolittle Avenue. Riverside supplied 137 AF of recycled water in 2009 near the boundary with the Arlington Basin in the southern part of the Riverside Basin. Customers include the Van Buren Golf Center, Van Buren Urban Forest, and Toro Manufacturing Company (Jones & Stokes, 2006).

2.5.3 RECYCLED WATER QUANTITY AND QUALITY

Currently, the Riverside RWQTP operates under the NPDES permit designated as Order No. 01-3, NPDES No. CA0105350 with Adoption Order No. R8-2006-0009. This permit includes requirements that implement the Basin Plan. Effluent quality standards require tertiary treatment with filters and disinfection equivalent to California Title 22 requirements for recycled water because of use of receiving waters for water contact recreation. The Riverside RWQTP produces effluent that consistently conforms to the Title 22 requirements. Data from 2001 showed average effluent TDS of 520 mg/L. The 37,000 AFY of effluent from the plant far exceeds existing recycled water distribution capacity (Parsons, 2003; Jones & Stokes, 2006).

Effluent from the RIX facility is treated to tertiary standards to comply with Title 22, Division 4, of the California Code of Regulations. A portion of the discharged water, 16,000 AFY, is provided by contract to Valley District to maintain flows in the Santa Ana River, fulfilling Valley District's downstream obligations under the Orange County Judgment. The remainder of the discharged amount is excess water, subject to potential reuse. This amount is estimated at approximately 21,000 AFY in 2005, projected to increase to 32,000 AFY by 2025. However, the physical setting of the RIX facility 300 feet below the elevation of the service area makes the supply less desirable as recycled water due to pumping costs (San Bernardino, City of, 2005).

Discharge of treated effluent into the Santa Ana River is an important component of meeting the annual delivery of base flow at Prado Dam of 42,000 AFY as mandated in the Orange County Judgment. As discussed previously, the Orange County Judgment is a physical solution adopted by the Court to resolve claims of inter-basin allocation of obligations and rights in the Santa Ana Watershed.

The quality of recycled water for future recycled water users will meet regulatory guidelines and will also meet the unique needs of specific users through blending or treatment techniques.

3 WATER REQUIREMENTS AND SUPPLIES

This section discusses the historical, current, and future water supplies of the Plan Area. Supply details are in the following subsections:

- Section 3.1, Current and Historical Water Requirements and Supplies, provides information on both the individual producer level and the basin-wide level. Historical groundwater production data are presented for 1965 through 2009. Details on the current supply mix are based on recent data from stakeholders in the basin.
- Section 3.2, Projected Water Requirements and Supplies, provides information on both the individual producer level and the basin-wide level. Projected water supplies are presented through 2030.

3.1 CURRENT AND HISTORICAL WATER REQUIREMENTS AND SUPPLIES

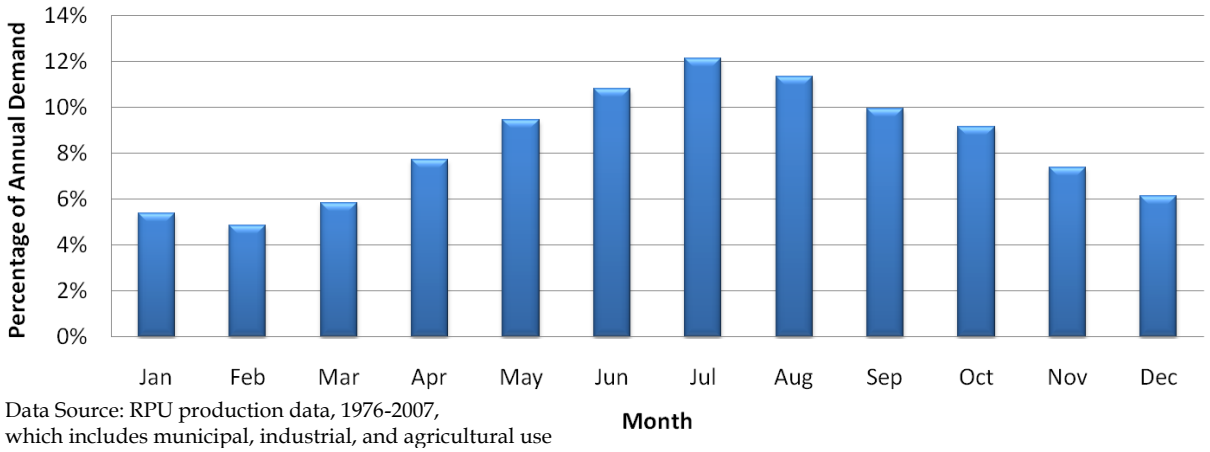
Water supplies in the Riverside Basin have shifted over the latter half of the 20th Century from meeting a largely agricultural demand to meeting a largely urban demand. Citrus acreage in Riverside reached its largest extent in the early 1940s at 12,000 acres and has declined dramatically since that time (Salazar, 1997). Today, approximately 2,700 acres of citrus remain within the boundaries of the Riverside Basin and the Arlington Basin, largely within the Arlington Heights Greenbelt; the Plan Area contains approximately 1,200 acres of citrus (Southern California Association of Governments, 2005).

Riverside's population grew as the citrus acreage increased from the late 1800s through the 1940s. However, the population increased even more rapidly after World War II as urbanization replaced citrus trees with homes and businesses (Salazar, 1997). The City of Riverside's population increased from 3,000 in 1883 (Holmes, 1912), 13 years after the settlement's founding, to approximately 295,397 residents in 2008 (US Census Bureau, 2011). Areas surrounding the City of Riverside have seen similar conversions from agriculture to urban uses. Likewise, water suppliers have shifted from providing primarily agricultural water to primarily urban water, while continuing to use existing assets such as wells and conveyance systems and continuing to support local agricultural interests.

Groundwater has always played an important role in meeting the water supply needs for the Plan Area. Early water development took advantage of flowing artesian wells that could supply water without the need for a pump. Groundwater production increased with the growing agricultural and urban water demands. Today, groundwater from the Riverside Basin is used by retail water agencies and private groundwater pumpers to meet all or a portion of their demands.

Groundwater production in other basins and other water supply sources are also used to meet demands in the Riverside Basin. Some agencies have groundwater production wells within the Arlington, Bunker Hill, Chino, Lytle, and Colton basins. Similarly, some water pumped in the Riverside Basin is served outside the basin. Imported water and smaller quantities of local surface water and recycled water complete the historical supply mix. Wholesale imported water for agency use is provided by Western for portions of the Plan Area within Riverside County and by Valley District for portions of the Plan Area within San Bernardino County. Table 3.1 summarizes the water supply sources for agencies overlying the Riverside Basin based on current data. Agency-specific details are provided in Section 3.1.3.

Water demand in the Plan Area is higher in summer months than in winter months, primarily due to the climatic conditions discussed in Section 2.1. The current water supply facilities are capable of meeting demands throughout the year, including extremely hot, dry days with corresponding high water use. The typical average monthly water demand distribution is shown in Figure 3.1, based on monthly production data from RPU.



Data Source: RPU production data, 1976-2007, which includes municipal, industrial, and agricultural use

Figure 3.1
Average Monthly Distribution of Annual Demand

Table 3.1
Summary of Current Water Supply Sources

Agency	Supply (AFY)						
	Riverside Basin Groundwater	Other Groundwater	Imported Water	Lytle Creek Surface Water	Recycled Water	Transfers/ Other	Total
Colton	1,522	9,614	-	-	-	-	**11,136**
Empire Water	533	-	-	-	-	-	**533**
Jurupa	581	33,192*	-	-	-	480	**34,253**
Meeks & Daley	1,010	5,714	-	-	-	-	**6,724**
RPU	41,671	43,061	-	-	137	-	**84,869**
Riverside Highland	2,706	1,648	-	-	-	-	**4,354**
Rubidoux	6,609	-	-	-	-	-	**6,609**
West Valley	938**	14,823	859	4,338	-	-	**20,958**
Other	459	-	-	-	-	-	**459**
Private	5,699	-	-	-	-	-	**5,699**
Total	**61,728**	**108,052**	**859**	**4,338**	**137**	**480**	**175,594**

* Includes 15,145 AF of purchases from the Chino I and II desalters

** West Valley's projected production includes production within the DWR-defined Riverside-Arlington Basin but outside of the 1969 Western Judgment-defined Riverside Basin. Current West Valley production from the DWR-defined Riverside-Arlington Basin is 2,118 AF.

Agency data based on 2009 data (Watermaster, 2010; Jurupa, pers. comm. December 7, 2010; West Valley, pers. comm. December 30, 2010; Colton, pers. comm. December 15, 2010).

3.1.1 WHOLESALE WATER AGENCIES

Two regional water agencies, Valley District and Western, import water into the Plan Area. Both are water wholesalers in the Plan Area. Valley District has no retail customers and Western's retail customers are all outside of the Plan Area.

3.1.1.1 San Bernardino Valley Municipal Water District

Valley District formed in 1954 under the Municipal Water District Act of 1911 (California Water Code Section 71000 et seq.) as a regional agency to plan a long-range water supply for the San Bernardino Valley. Its enabling act includes a broad range of powers to provide water, wastewater and stormwater disposal, recreation, and fire protection services. It imports water into its service area as a SWP contractor and manages groundwater storage within its boundaries. Valley District is the fifth largest SWP contractor, with an annual entitlement of 102,600 AF. Valley District lies on the East Branch of the California Aqueduct and takes delivery of SWP water at the Devil Canyon Power Plant. From this location, it can deliver water to the west via the San Gabriel Valley Municipal Water District Pipeline or to the east through the East Branch Extension of the SWP. Valley District does not deliver water directly to retail water customers.

Valley District covers approximately 325 square miles mainly in southwestern San Bernardino County, approximatley 60 miles east of Los Angeles, and has a population of about 600,000. It spans the eastern two-thirds of the San Bernardino Valley, the Crafton Hills, and a portion of the Yucaipa Valley and includes the cities and communities of San Bernardino, Colton, Loma Linda, Redlands, Rialto, Fontana, Bloomington, Highland, East Highland, Grand Terrace, Mentone, and Yucaipa.

Valley District is responsible for long-range water supply management, including importing supplemental water. It is also responsible for most of the groundwater basins within its boundaries and for groundwater production over the amount specified in the judgments. It has specific responsibilities for monitoring groundwater supplies in the San Bernardino and Colton Subbasin and maintaining flows at Riverside Narrows on the Santa Ana River. Valley District fulfills its responsibilities in a variety of ways, including importing water through the SWP for direct delivery and groundwater recharge and coordinating water deliveries to retail agencies throughout its service area (Upper Santa Ana Water Resources Association, 2007).

Valley District is a member agency of SAWPA, which is working toward a sustainable Santa Ana River Watershed that is salt balanced and drought proofed, and supports economic and environmental vitality, as well as an enhanced quality of life. Valley District's chief engineer is a court-appointed Santa Ana River Watermaster, responsible for reporting compliance with water quality and quantity provisions of court orders regarding water rights issues in the Santa Ana Watershed.

3.1.1.2 Western Municipal Water District

Western was formed by the voters in 1954 to bring supplemental water to western Riverside County. Today, Western serves more than 25,000 retail customers in Riverside and Murrieta and nine wholesale customers with water from both the Colorado River and the SWP as a member agency of Metropolitan. Approximately one-quarter of the water Western purchases from Metropolitan comes from the Colorado River Aqueduct and the remaining three-quarters from the SWP, which transports water from Northern California via the California Aqueduct. Western also imports a small quantity of non-potable groundwater from the Riverside/ San Bernardino area. Western's only groundwater production is from the Arlington desalter wells in the Arlington Basin and from the Chino Basin. RPU provides interruptible domestic supplies to Western when RPU has available water supply.

Western is one of five member agencies of SAWPA, a regional water resources planning and project implementation organization. Western's general manager is a court-appointed Santa Ana River Watermaster, responsible for reporting compliance with water quality and quantity provisions of court orders regarding water rights issues in the Santa Ana Watershed.

Western's general district consists of a 510 square mile area of western Riverside County and a population of more than 850,000 people. Western currently sells more than 100,000 AF of water annually. Improvement districts, the retail portion of Western's general district, cover approximately 73 square miles, and Western's retail service provides water to an estimated population of 80,000, based on 3.2 persons per household for approximatley 25,000 residential domestic services (Western, 2008; Western, 2009).

3.1.2 RAPID INFILTRATION AND EXTRACTION FACILITY

As discussed in Section 2.5.1.4, the RIX facility is an offsite tertiary treatment facility operated jointly by the cities of San Bernardino and Colton. It receives approximately 33 MGD of secondary treated wastewater from San Bernardino's Chandler Water Reclamation Plant and Colton's Wastewater Reclamation Facility. The facility was placed into service in 1995. Operation of this facility requires pumping in excess of the infiltrated water volume (known as overextraction, historically 20 - 30 percent above the recharged water volume) by shallow extraction wells surrounding the basins. The water is treated for disinfection purposes. This water is not for water supply, but is returned to the Santa Ana River, thus the production is not included in the remainder of this section. However, this production does have an impact on groundwater and surface water supplies. Historical overextraction is shown in Figure 3.2, based on information from the Watermaster (2010a).

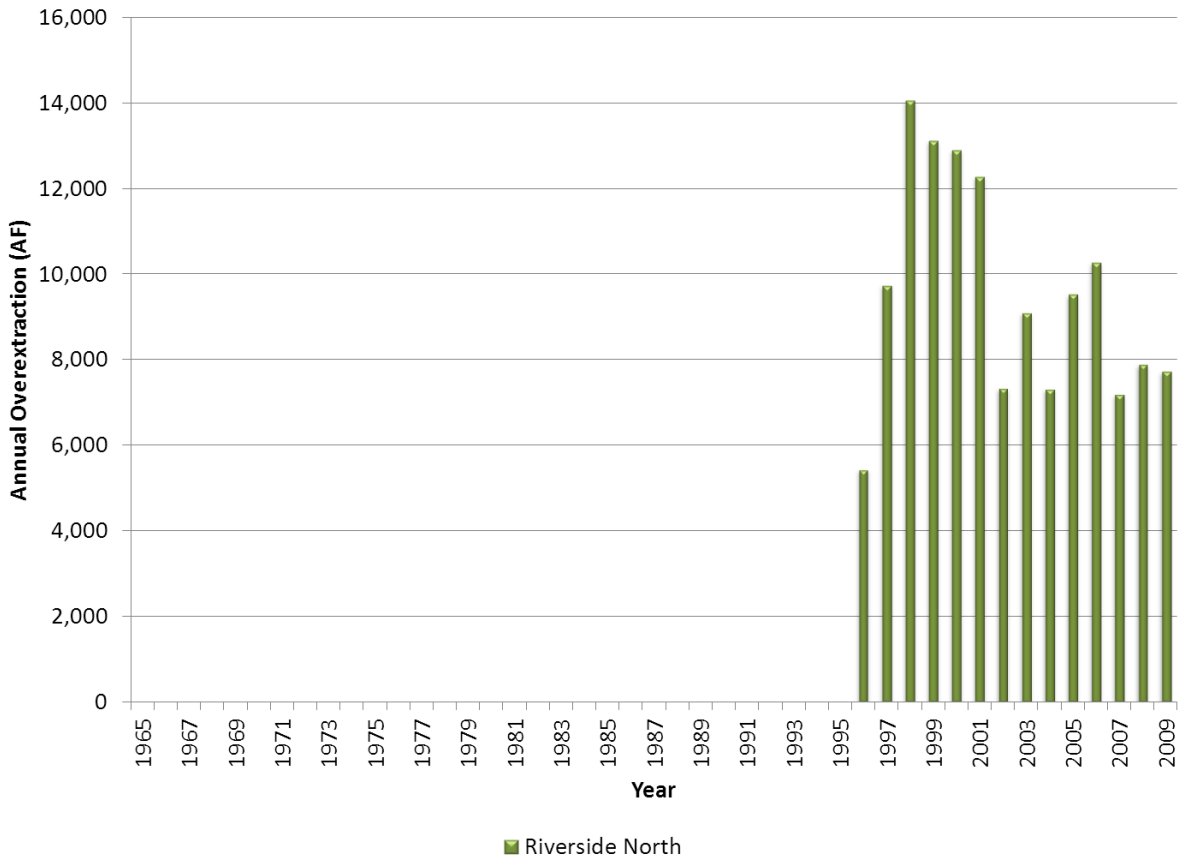


Figure 3.2
RIX Facility Historical Annual Overextraction from the Riverside Basin

The City of San Bernardino's Clean Water Factory Project is currently in feasibility and pilot project phases and will ultimately reduce the applied water at RIX by approximately 50 percent (to 16,000 AFY, the minimum established by the 1969 Western Judgment) in roughly 10 years.

3.1.3 RETAIL AGENCY WATER USE

Details on water use by the retail agencies are presented in the following sections. Data are available from the individual agency urban water management plans (UWMPs), the Western IRWMP, the Upper Santa Ana River Watershed IRWMP, and historical groundwater production records from the Watermaster. These available data sources provide a summary of supply sources, quantification of the current supply mix, and quantification of historical groundwater production. Historical conditions are represented by Plan Area groundwater production data from the Watermaster for 1965 – 2009. Current conditions are represented by 2009 data from the Watermaster for Riverside Basin groundwater and from direct communication with the individual agencies for the remaining supply sources, such as imported water, recycled water, and groundwater from outside of the Riverside Basin.

3.1.3.1 Colton

Water is supplied to Colton by the Colton Water Department. Colton covers 16 square miles (Figure 1.2) and has a population of more than 51,000 residents. Colton's existing potable water system facilities consist of fifteen wells, five main booster pumping plants, nine water storage reservoirs, two pressure reducing facilities, and more than 120 miles of water transmission and distribution pipelines. The water system serves over 9,000 customers.

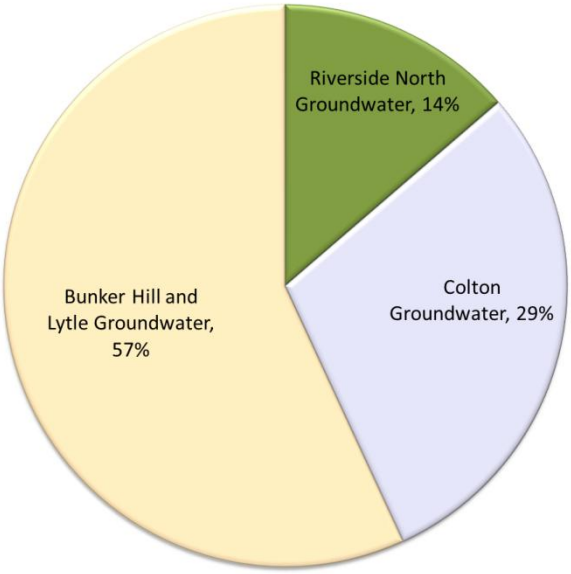


Figure 3.3
Colton Current Water Supply Sources

Groundwater makes up 100 percent of Colton's water supply. In 2009, Riverside Basin groundwater accounted for 1,522 AF of the 11,136 AF total supply (Watermaster, 2010a), or approximately 14 percent of the total supply, as shown in Figure 3.3. All of Colton's Riverside Basin groundwater production occurs in Riverside North. Other groundwater sources for Colton include Bunker Hill and Colton groundwater basins.

Riverside Basin groundwater production by Colton is relatively recent, beginning in 1995, and has averaged 1,354 AFY from 1995 to 2009 (Watermaster, 2010a). Annual production is shown in Figure 3.4 based on production records from the Watermaster (2010a).

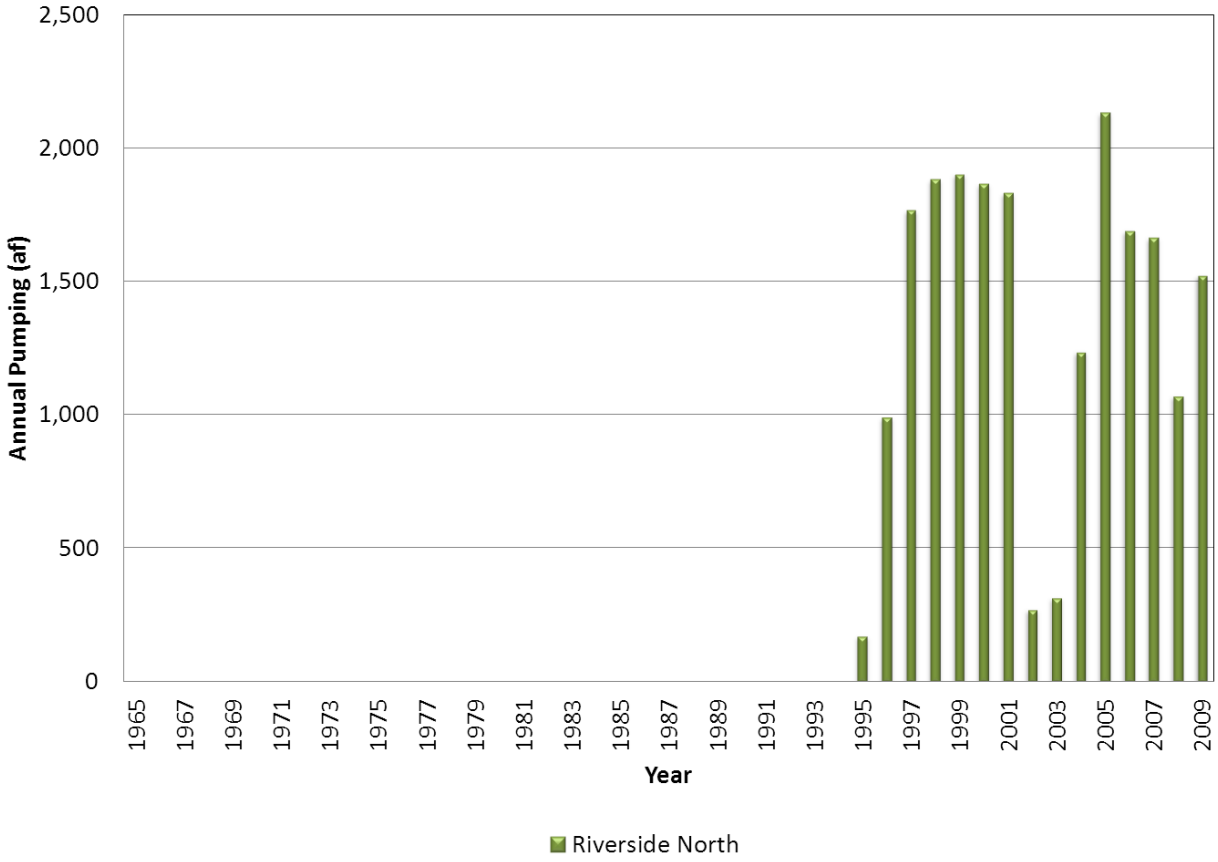


Figure 3.4
Colton Historical Annual Riverside Basin Groundwater Production

3.1.3.2 Empire Water Company

In 2007, Empire acquired the West Riverside Canal Company and the 350 Inch Water Company. Founded in 1891, the 350 Inch Water Company operates two wells and a pipeline distribution system producing 460 AFY of non-potable water. The West Riverside Canal was built in 1886 to bring irrigation water to San Bernardino and Riverside Counties. During its 100-year operating history, it transported roughly 9,000 AFY. Empire owns and operates the West Riverside Canal, including 18 miles of conveyance corridor, two operating wells, and 19,000 feet of pipeline. This system produces almost 600 AFY of irrigation water annually (Empire Water, 2009).

Historical Empire production includes production by the 350 Inch Water Company and is shown back to 1965 in Figure 3.5. Prior to 1985, production was from Well No. 7 and 350 Inch Well No. 5 in Riverside North. After 2003, production was from Wells No. 1 and No. 2 in Riverside South. From 1965 to 2009, production averaged 727 AFY. In 2009, Riverside South groundwater accounted for all 533 AF of Empire Water's supply. Previous production by the 350 Inch Water Company was from Riverside North (Watermaster, 2010a).

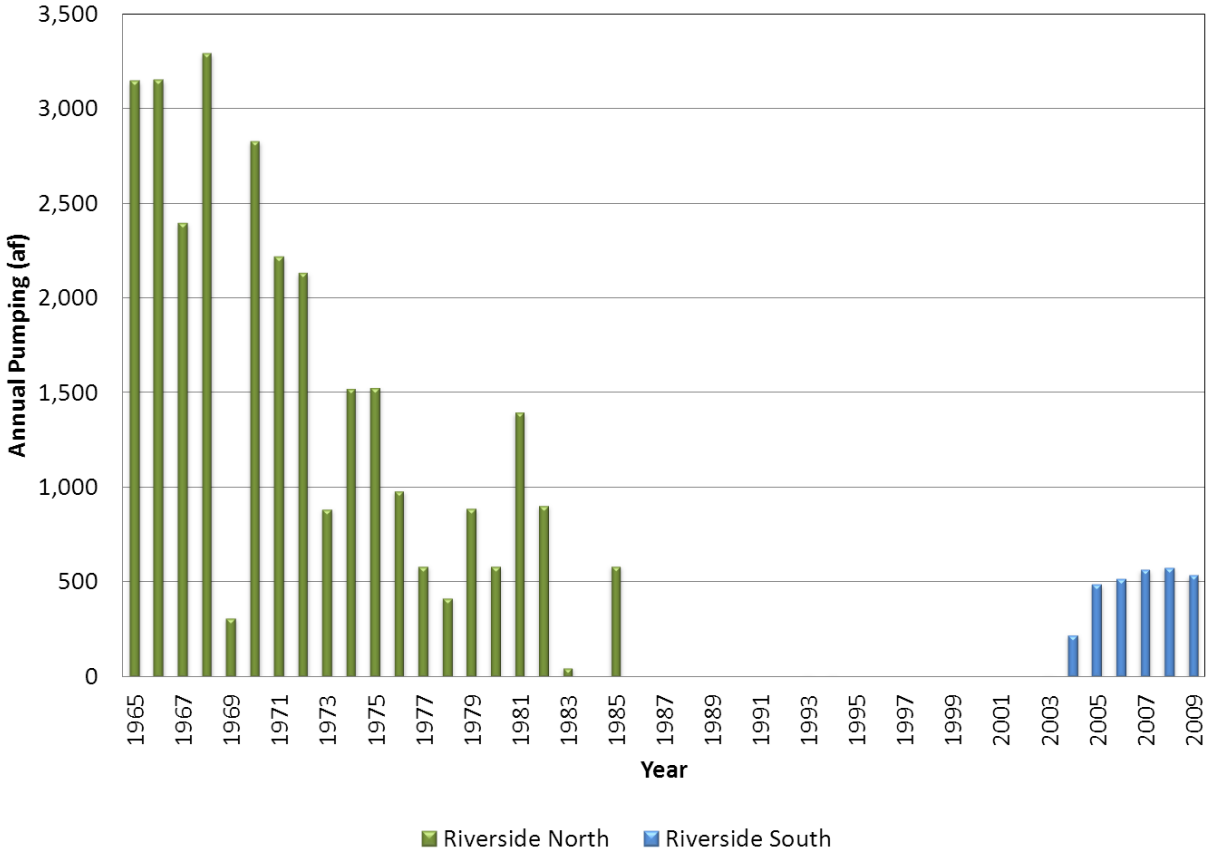


Figure 3.5
Empire Historical Annual Riverside Basin Groundwater Production

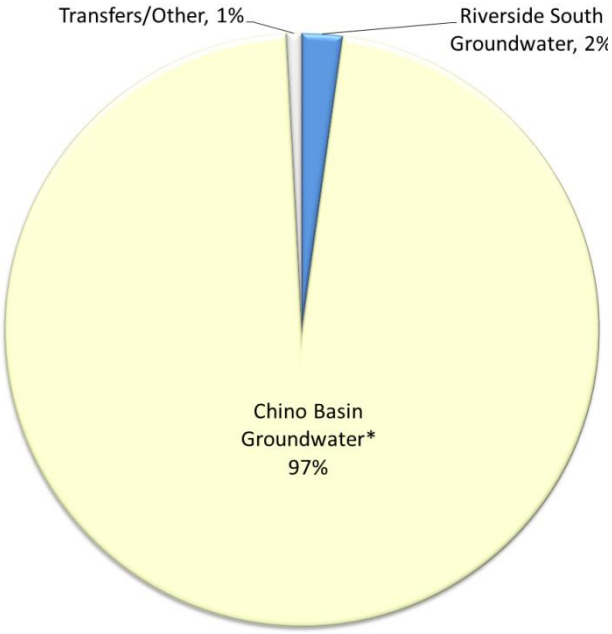
3.1.3.3 Jurupa Community Services District

Jurupa added water supply to its services in 1966 after the consolidation of Jurupa Heights Water Company, La Bonita Mutual Water Company, and Monte Rue Acres Mutual Water Company. Jurupa's service area covers 48 square miles and currently serves approximately 86,000 customers (22,000 water connections); Jurupa also provides water through interties to its neighboring water agencies: the City of Norco and the Santa Ana River Water Company.

Jurupa currently has 15 potable wells and 5 irrigation wells, 7 booster stations, and 15 reservoirs with a 39 million-gallon capacity. In addition to the 22,000 potable water connections, there is a small irrigation water system in the Sunnyslope area. Jurupa produced 33,733 AF of groundwater in 2009, primarily from the Chino Basin and the Chino Basin Desalter Authority's Chino I and II groundwater desalters (Jurupa, pers. comm., December 7, 2010).

Jurupa's current supply includes groundwater and desalted groundwater from the Chino Basin, a small amount of groundwater from the Riverside Basin, transfers from Rubidoux, and others. In 2009, Riverside Basin groundwater accounted for 581 AF of a total supply of 34,253 AF (Watermaster, 2010a; Jurupa, pers. comm., December 7, 2010), or approximately 2 percent of the total supply, as shown in Figure 3.6. All of Jurupa's Riverside Basin groundwater production occurs in Riverside South.

As shown in Figure 1.3, very little of the Jurupa area is within the Plan Area. The Plan Area does include the Sunnyslope area irrigation system that provides water to the agricultural users in that area. Historical production by Jurupa within the Plan Area is small, averaging 560 AFY from 1965 to 2009 (Watermaster, 2010a). Annual Jurupa production from the Riverside Basin is shown in Figure 3.7, based on production records from Watermaster.



* Includes Chino Basin I and II Desalters

Figure 3.6
Jurupa Current Water Supply Sources

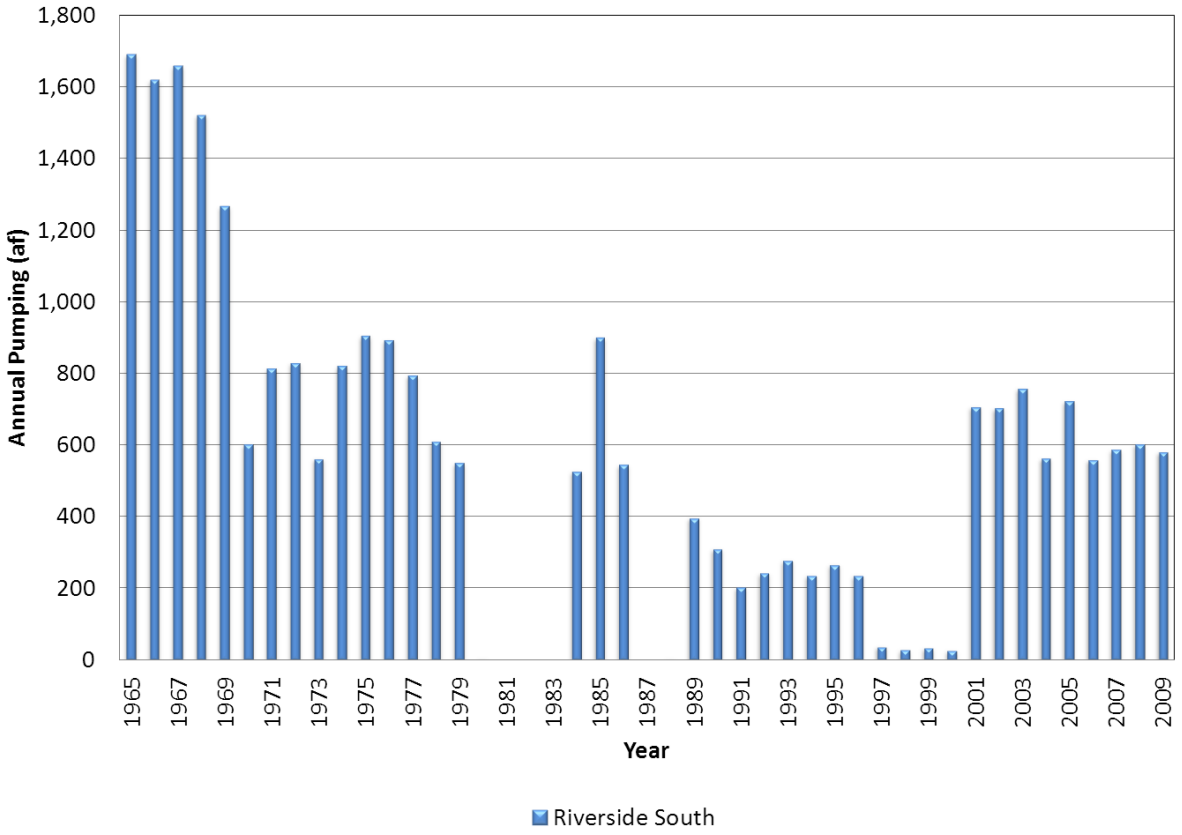


Figure 3.7
Jurupa Historical Annual Riverside Basin Groundwater Production

3.1.3.4 Meeks & Daley Water Company

Meeks & Daley incorporated in 1885, and is the successor company to three mutual water companies: Meeks & Daley Water Company, Agua Mansa Water Company, and Alta Mesa Water Company. Meeks & Daley originally formed to distribute water from a canal built by Riverside Canal Company with sources from the Santa Ana River and Warm Creek (Lippencott, 1902).

Meeks & Daley provides water to its shareholders for agricultural purposes. To fund operating expenses, the company assesses shareholders twice per year based on the number of shares owned on the date of the assessment. RPU owns approximately 40 percent of the Meeks & Daley stock and Elsinore Valley Municipal Water District owns approximately 60 percent, along with other smaller private shareholders.

The company has water rights in the Bunker Hill Basin and pumps water from a series of wells within that basin, transporting the water through the Riverside and Gage canals. At the terminus of the canal systems, Meeks & Daley operates a pipeline and pump station to deliver

irrigation water to users in the southern portion of the City of Corona. Meeks & Daley also produces water from the Colton Basin through its No. 36 Well.

Within the Riverside Basin, Meeks & Daley operates one well: Palm Avenue Well (owned by Elsinore Valley Municipal Water District). With the construction of additional delivery facilities in 1996, Meeks & Daley began delivering water to OCWD under the Orange County Water Transfer Project, with water delivered to the Santa Ana River for storage behind Prado Dam and subsequent release and groundwater recharge downstream (Upper Santa Ana Water Resources Association, 2007). The Palm Avenue Well was part of the Orange County Water Transfer Project through early 2009, but currently water from the Palm Avenue Well is delivered to Western for non-potable use.

Historical production by Meeks & Daley within the Riverside Basin is from the Palm Avenue Well, as shown in Figure 3.8. Over the 1965 to 2009 time period, production averaged 1,312 AFY. In 2009, Riverside Basin groundwater accounted for 1,010 AF of Meeks & Daley's total supply. All of Meeks & Daley's Riverside Basin groundwater production occurs in Riverside North (Watermaster, 2010a).

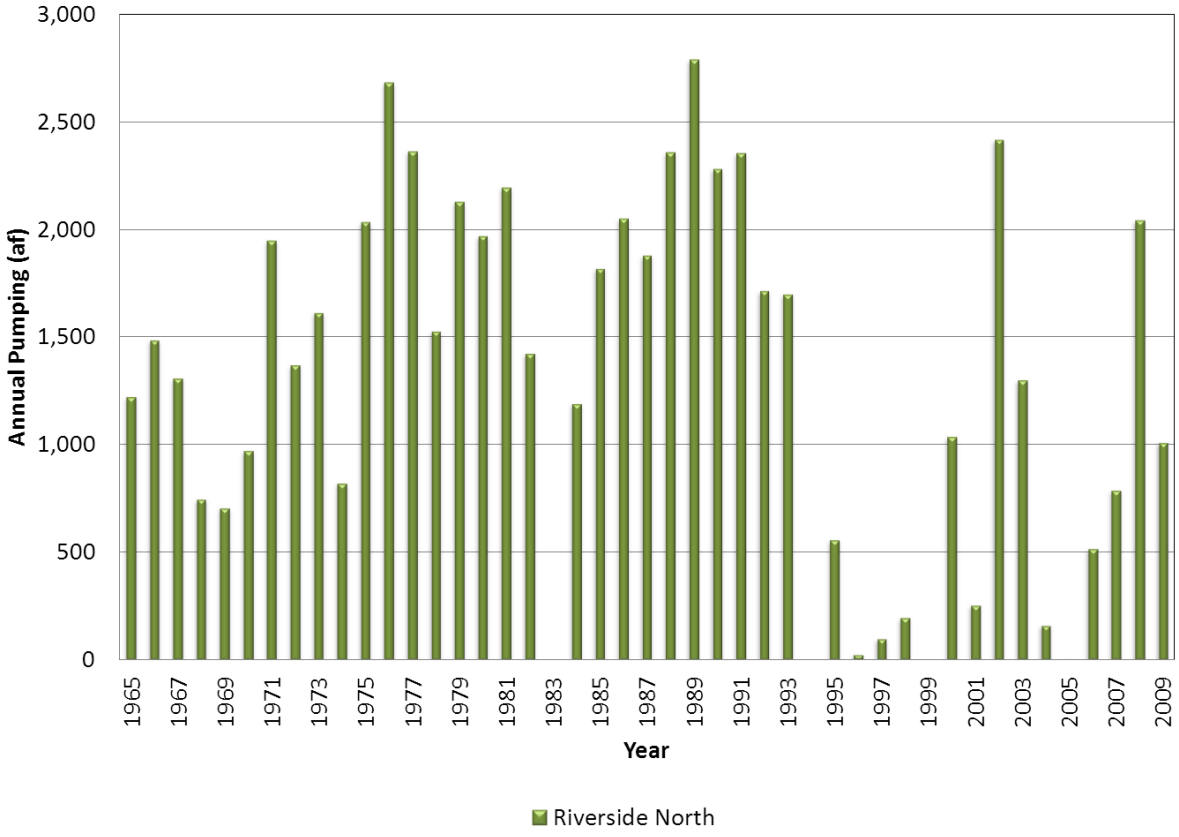


Figure 3.8
Meeks & Daley Historical Annual Riverside Basin Groundwater Production

3.1.3.5 Riverside Public Utilities

RPU provides water to 64,000 services (298,000 customers) within a service area of 74 square miles (Figure 1.3), of which approximately 5 square miles are outside the Riverside city limits. Within the City of Riverside, RPU provides water service for 69 square miles, while Western serves 9 square miles, Eastern Municipal Water District serves 1 square mile, and Riverside Highland serves 0.25 square miles. The areas within Riverside city limits served by Western and Eastern Municipal Water District are outside the Plan Area.

Information presented for RPU also includes production of the Gage Canal Company. RPU acquired the assets of the Gage Canal Company in 1965 and owns approximately 60 percent of the mutual water company's water shares.

RPU's water supply is almost entirely groundwater produced from the Bunker Hill Basin in San Bernardino County and the Riverside Basin in San Bernardino and Riverside counties, with minor production in the Colton Basin. The remainder is imported water from Western and recycled water.

In 2009, RPU extracted 37,531 AF of Riverside Basin groundwater and Gage Canal Company extracted 4,140 AF of Riverside Basin groundwater. Riverside Basin groundwater provides approximately 49 percent of the 2009 total supply of 84,869 AF (RPU, pers. comm. 2010; Watermaster, 2010a), as shown in Figure 3.9. Riverside Basin groundwater production by RPU and Gage Canal Company was divided in 2009 between Riverside North (37 percent or 15,215 AF) and Riverside South (63 percent or 26,456 AF). Of the 15,215 AF extracted from Riverside North, 1,601 AF was extracted by the Gage Canal Company. The 26,456 AF extracted from Riverside South includes 2,539 extracted for the Gage Canal Company (Watermaster, 2010a).

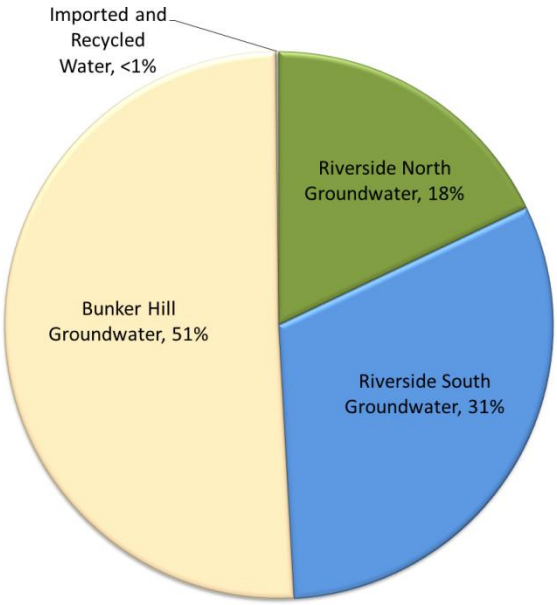


Figure 3.9
RPU 2009 Water Supply Sources

RPU's current strategy for groundwater production is to fully utilize the 53,426 AFY entitlement (including entitlements through share ownership in mutual water companies) to export water from the Bunker Hill Basin (RPU, pers. comm., 2010) and extract approximately 40,000 AFY from Riverside Basin to meet remaining demands. This will result in a supply mix of 51 percent groundwater from Bunker Hill Basin and 49 percent groundwater from Riverside Basin.

Recycled water continues to be a small component of the current water supply at less than 1 percent.

Historical groundwater production by RPU within the Plan Area averaged 25,512 AFY from 1965 to 2009 with production increasing over that period (Watermaster, 2010a). Annual production from the Riverside Basin is shown in Figure 3.10, based on production records from the Watermaster.

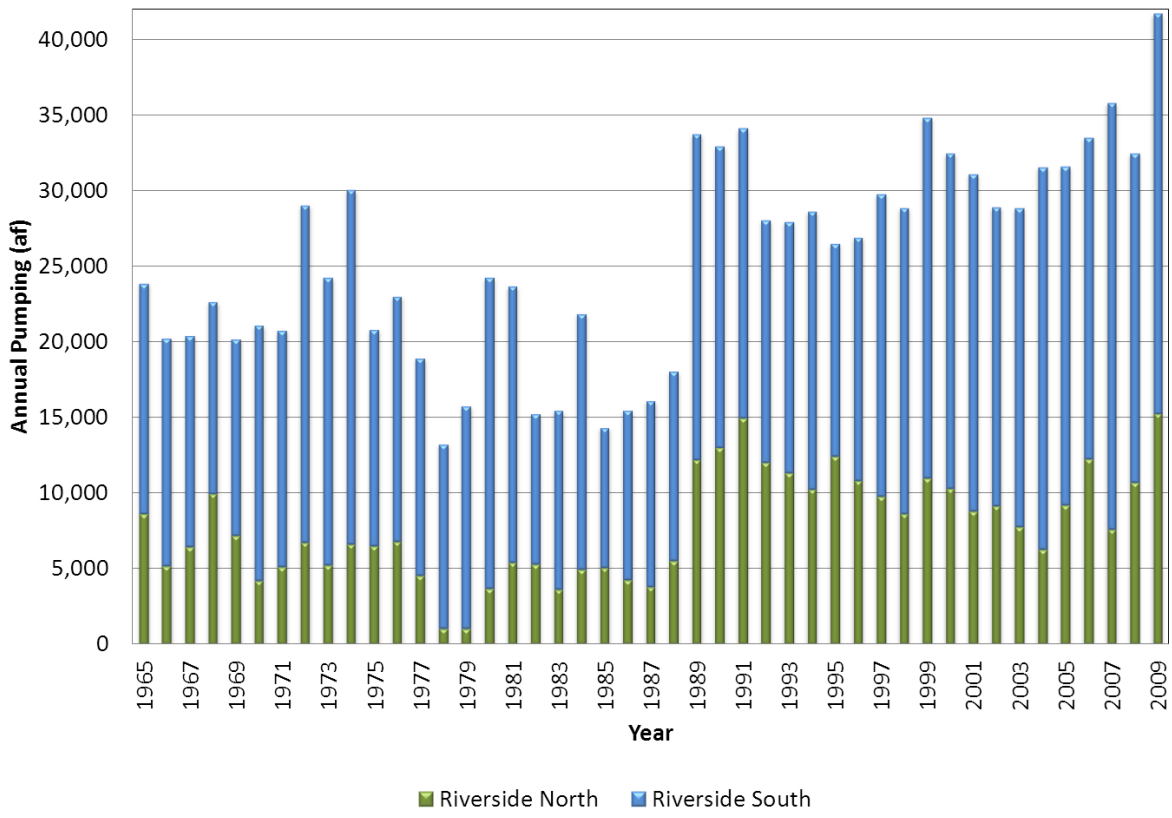


Figure 3.10
RPU Historical Annual Riverside Basin Groundwater Production

3.1.3.6 Riverside Highland Water Company

Riverside Highland has approximately 3,900 water services and provides water to approximately 14,000 customers within a service area of roughly 8.6 square miles (Figure 1.3) (Western, 2008). Riverside Highland's water supply is provided by groundwater from the Riverside, Colton, and San Bernardino basins (including Bunker Hill Basin and Lytle Basin). The company has experienced a rapid decline in irrigation water demands due to the removal of citrus groves for urban development. Irrigation production is being converted to domestic production as urban development continues (Riverside Highland, 2005).

Riverside Highland currently has 13 operating wells: eight domestic supply wells, two irrigation wells with nitrate concentrations in excess of drinking water standards (Riverside Highland, 2005), and three standby wells.

Riverside Highland's current water supply includes groundwater from the Riverside, Lytle, and Bunker Hill basins. In 2009, Riverside Basin groundwater accounted for 2,706 AF of a total supply of 4,354 AF (Watermaster, 2010a), or approximately 62 percent of the total supply as shown in Figure 3.11. Riverside Highland historically has produced water from both Riverside North and Riverside South, however, in 2009 all Riverside Basin production occurred in Riverside North (Watermaster, 2010a). Historical groundwater production by Riverside Highland within the Plan Area averaged 4,191 AFY from 1965 to 2009 and has decreased over that period. Annual production is shown in Figure 3.12, based on production records from the Watermaster (2010a).

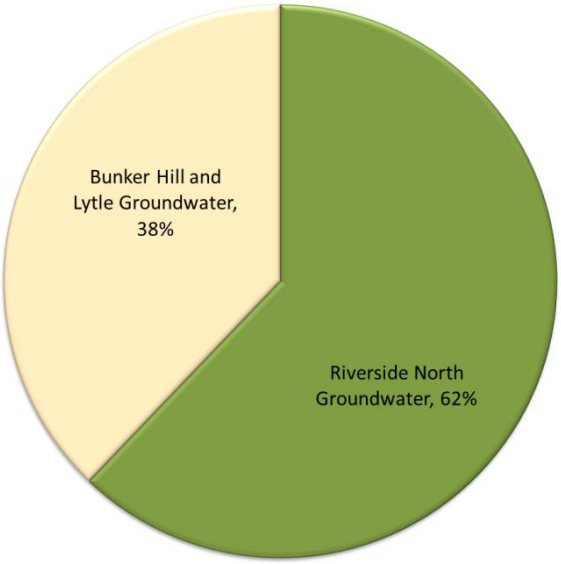


Figure 3.11
Riverside Highland
Current Water Supply Sources

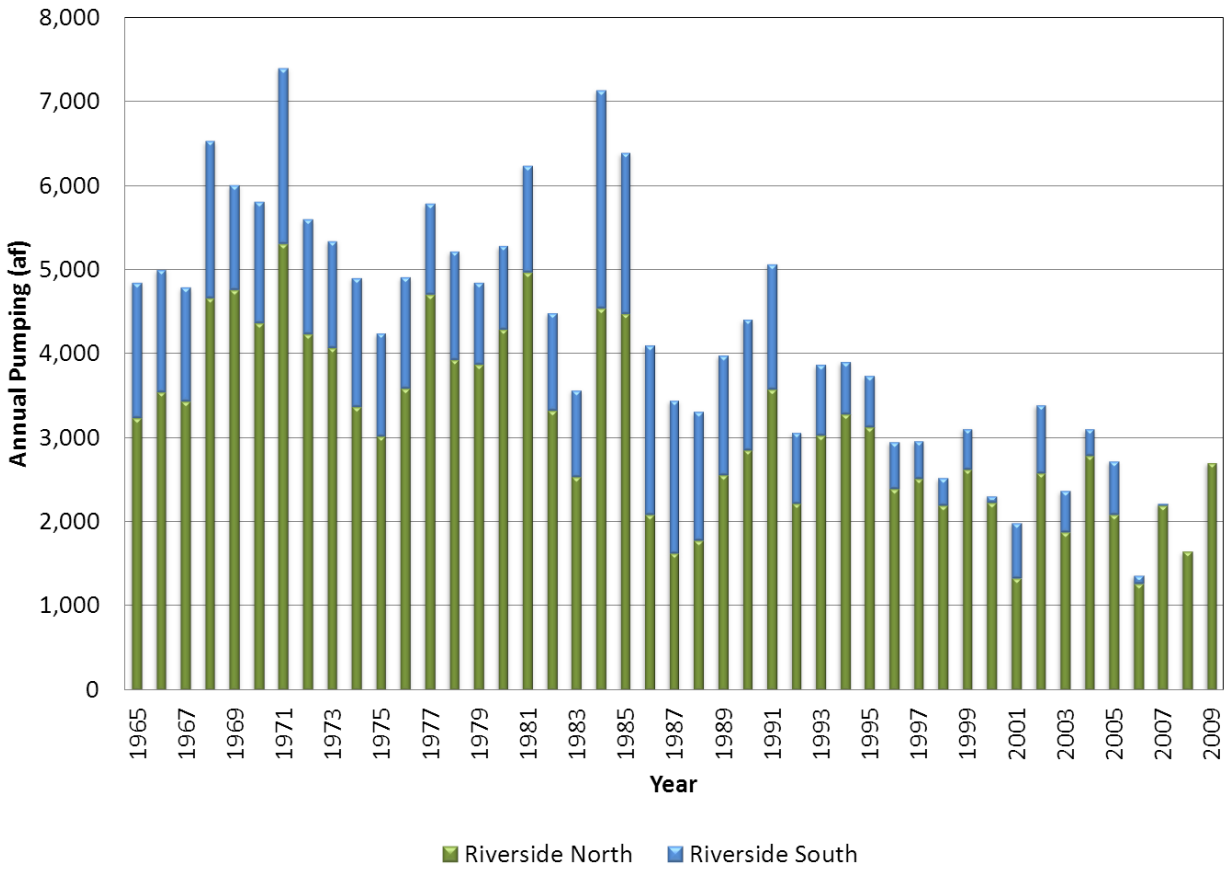


Figure 3.12
Riverside Highland Historical Annual Riverside Basin Groundwater Production

3.1.3.7 Rubidoux Community Services District

Rubidoux provides water to 27,000 customers (Western, 2008) within a service area of 7.5 square miles (Figure 1.3). Rubidoux currently has six active domestic water supply wells, two wells for construction water, and four wells for irrigation. Rubidoux's current supply is groundwater from the Riverside Basin, all within Riverside South (Rubidoux, 2007).

Current and historical groundwater production by Rubidoux within the Plan Area are entirely from Riverside South, averaging 4,838 AFY from 1965 to 2009, with an increasing trend over that period to a 2009 production of 6,609 AF. Annual production is shown in Figure 3.13 (Watermaster, 2010a).

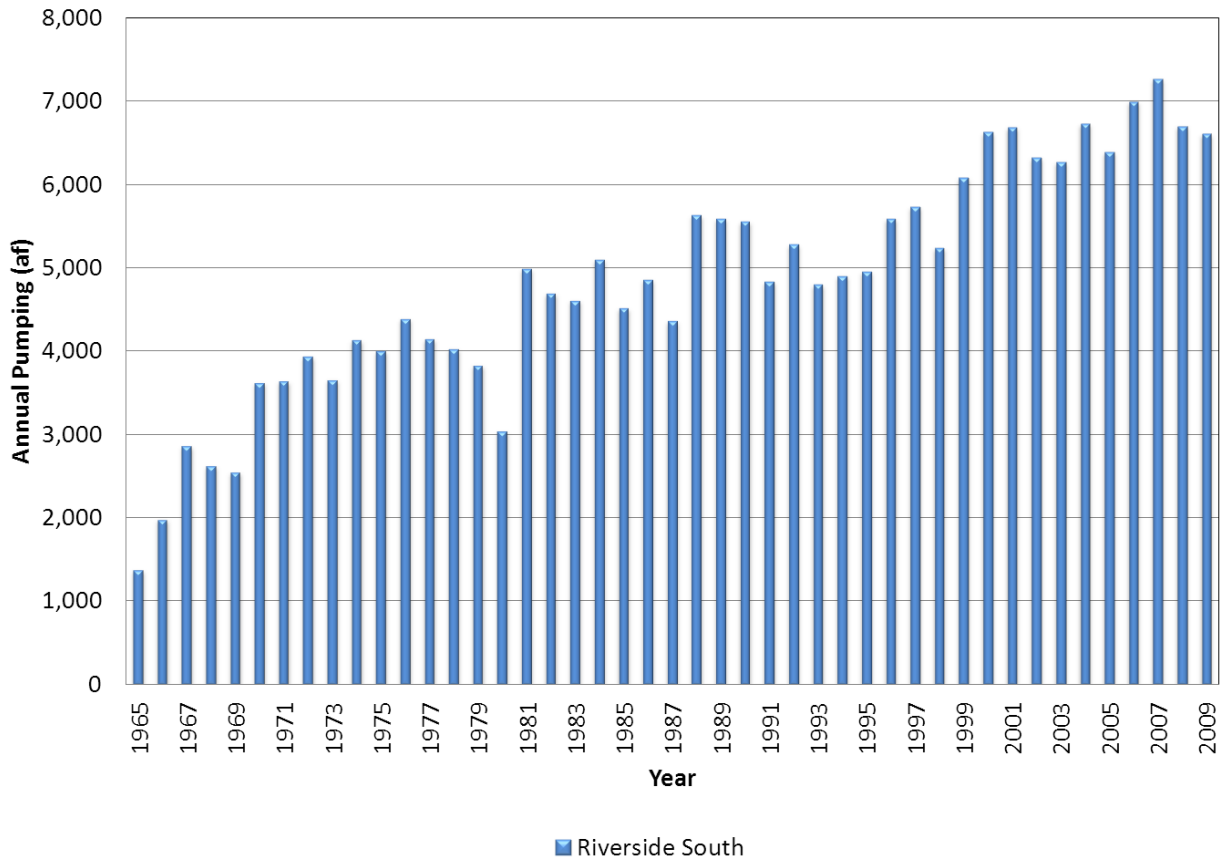


Figure 3.13
Rubidoux Historical Annual Riverside Basin Groundwater Production

3.1.3.8 West Valley Water District

West Valley formed in 1952 as the Bloomington County Water District and originally provided water to 200 customers in a 1 square mile area. Today, West Valley provides water to 18,000 connections within a service area of 29.5 square miles (Figure 1.3). West Valley's water supply is provided by groundwater from Lytle, Chino, Colton, Bunker Hill, and Riverside basins; surface water from Lytle Creek; and imported water from the SWP (West Valley, 2005).

In 2009, Riverside Basin groundwater accounted for 938 AF of West Valley's total supply of 20,958 AF (Watermaster 2010a; West Valley, pers. comm., December 30, 2010) or approximately 4 percent of the total supply, as shown in Figure 3.14. All of West Valley's Riverside Basin groundwater production occurs in Riverside North. In 2009, West Valley also produced groundwater from within the DWR-defined Riverside-Arlington Basin but outside of the 1969 Western Judgment-defined Riverside Basin. Total 2009 production from the DWR-defined Riverside-Arlington Basin was 2,118 AF.

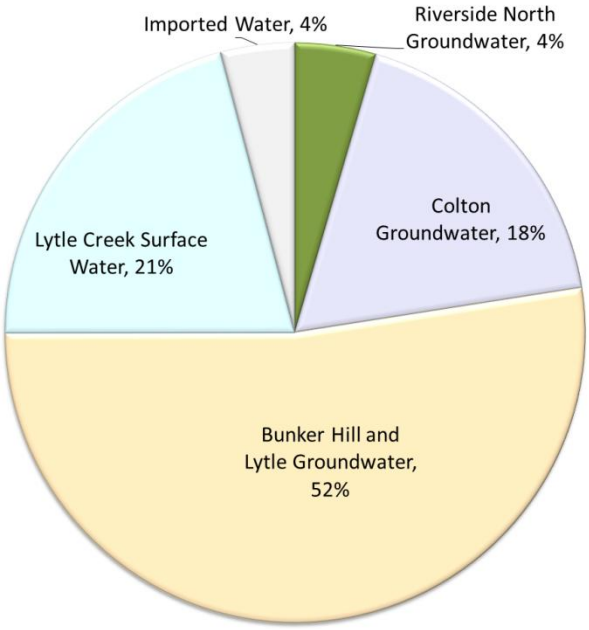


Figure 3.14
West Valley
Current Water Supply Sources

Historical groundwater production by West Valley within the Plan Area averaged 1,002 AFY from 1965 to 2009 with production levels increasing significantly in the late 1990s. Annual production is shown in Figure 3.15, based on production records from the Watermaster.

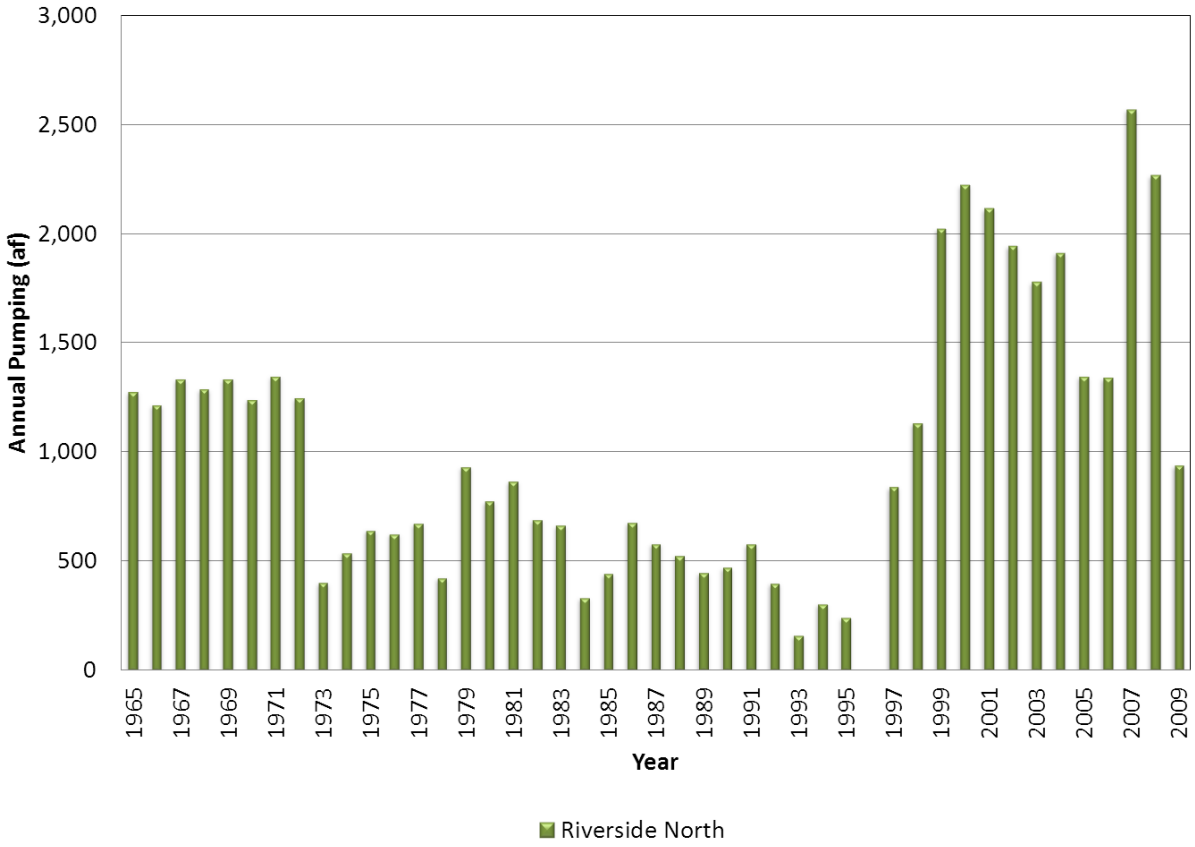


Figure 3.15
West Valley Historical Annual Riverside Basin Groundwater Production

3.1.4 OTHER GROUNDWATER PRODUCERS

Other groundwater producers include entities with an average Riverside Basin groundwater production of less than 300 AFY each between 1999 and 2009 and include the following current and/or historical users:

Alamo Water Company	Merryfield Water Company
Crestmore Heights Mutual Water Company	City of Rialto
City of Grand Terrace	Riverside Canal Power Company
Jumal Water Company	Riverside County Flood Control
Jurupa Water Company	Riverside County Parks Department
La Sierra Water Company	Rivino Water Company

The combined historical use of Riverside Basin groundwater by other producers averaged 2,644 AFY from 1965 to 2009, as shown in Figure 3.16. In 2009, other groundwater producers extracted 459 AF of groundwater. (Watermaster, 2010a).

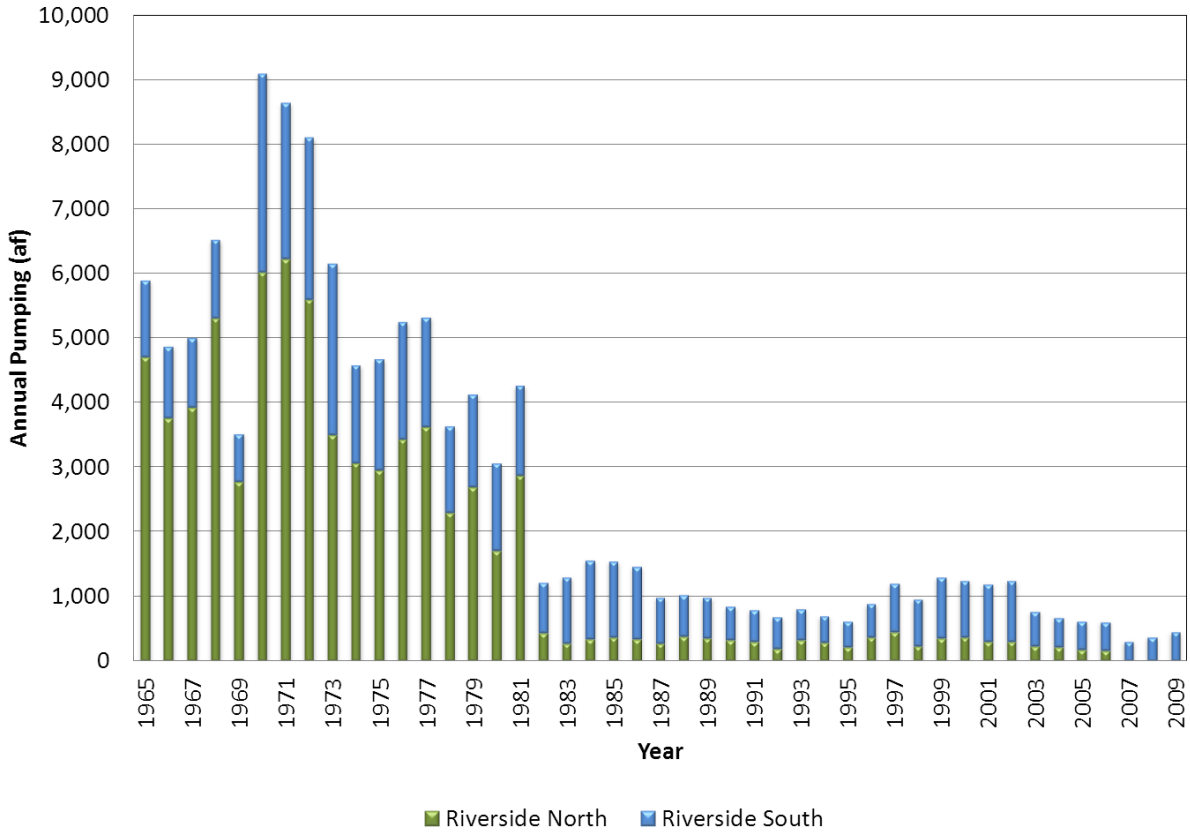


Figure 3.16
Other Groundwater Producers Combined Historical Annual Riverside Basin Groundwater Production

3.1.5 PRIVATE GROUNDWATER PRODUCERS

Private groundwater producers in the Plan Area pump groundwater for industrial uses; agricultural uses; irrigation for golf courses, cemeteries, and landscaping; and other uses. Few private producers have access to any significant water supply other than the underlying groundwater. The combined historical use of Riverside Basin groundwater by private groundwater producers averaged 10,088 AFY from 1965 to 2009, as shown in Figure 3.17 (Watermaster, 2010a). Individually, Riverside Basin groundwater use by private groundwater producers in 2009 ranged from zero for several producers to as much as 4,002 AF (by the California Portland Cement Company), with a total 2009 production of 5,699 AF. Private groundwater producers include the following current and/or historical users:

Agua Mansa Properties	Martin Linen (Tri-City Linen Supply Co)
Aguinaga, Roger	Martin, Kenneth Allan
Allee Ranch	Mason
Asphalt Recycling	Mastercraft Homes
Bradford, Ivan	McDaniel & Son Dairy
Bradvica, Louis	Michael, C.
Burns, F.L. & Laura	Milestone Ranch
California Baptist University	Mipo Corp, DBA Mission
California Dept. of Transportation District 8R	Property Acquisition Company
California Portland Cement Company	Rancho de Santa Fe
Canale Catering	Riverside Cement Company
Canyon Crest Country Club	Riverside Industrial Park
Carpenter Company	Riverside Thoroughbred Farm
Carson, K.	Rocky R Ranch
Citizens National Company	Roos, Charles R.
Corridor Land Company	Roquet, Harry V.
Country Club Storage	Rosedale Water Company
Daggett, Forest, N.	Ross, Sam
El Rivino Country Club	Schwab, A. M.
Firestone Group Ltd	Scope Corporation
Fisher, Charlotte	Service Rock Co.
General American Transportation Corp	Stapakis, William
Green Acres Memorial Park Association	Stoker, George
Grubbs, V. W.	Taylor, Walter & Barbara
Hamada Bros	Universal Forest Products
Heyming, Frank & Lucy	University of California, Regents of
Holliday Trucking	Victoria Country Club
Holter Ranch	Villelli Enterprises

Howell, Orus	Von Kanel, Alfred
Hungerford, Frank B.	Vulcan - Cal Mat
Hunter Engineering Company	Wagoner, John J.
Johnson, Dorothy	Waterman, Allen H.
Johnson, Truman	White Sulphur Springs Pool
Kleckler, Don	Wight, Charles H.
La Casa Contenta Motel	Woodland Farms
Loring Ranch 31503 LP	Yeager, Reidman & Horn
Madison, Erin	Zike, Vera

These users represent all known private producers at the time of publication.

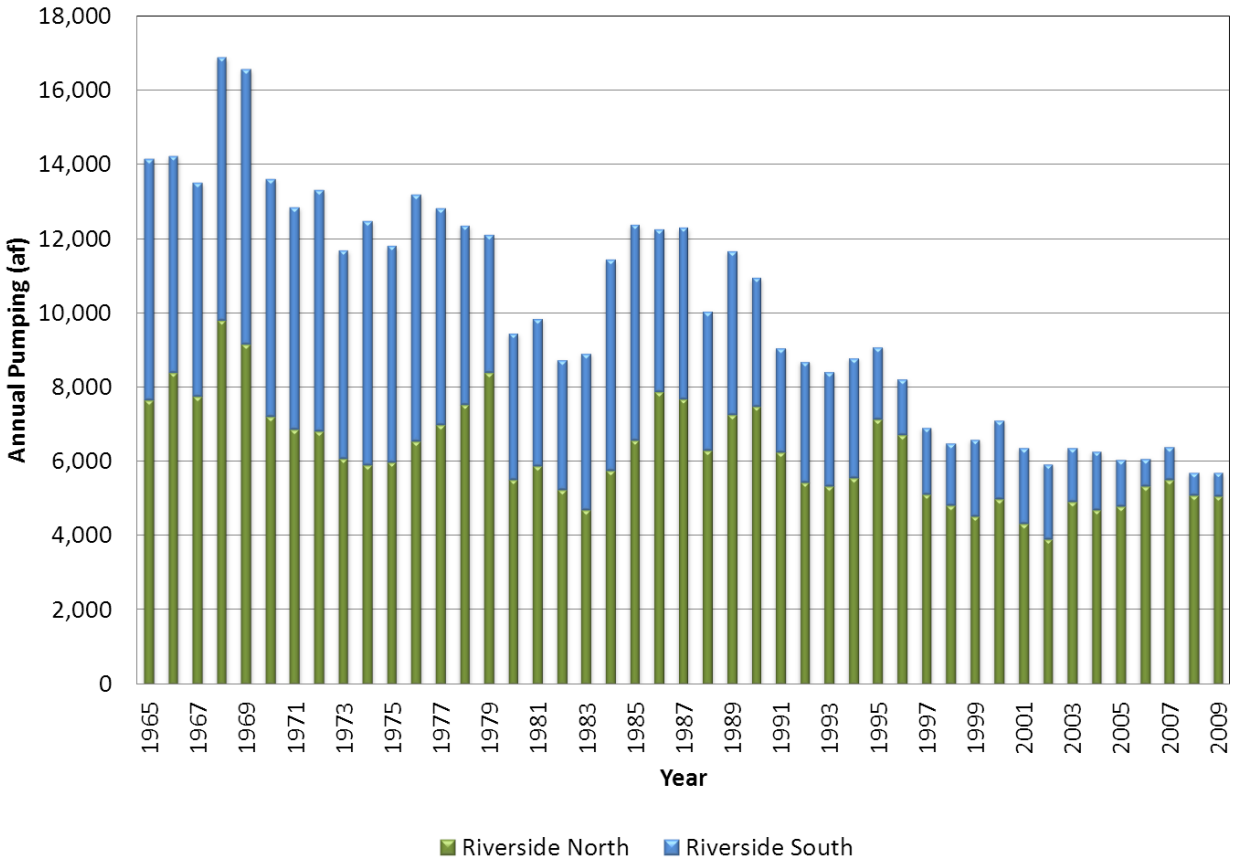


Figure 3.17
Private Groundwater Producers Historical Annual Riverside Basin Groundwater Production

3.1.6 TOTAL RIVERSIDE BASIN STAKEHOLDERS WATER SUPPLY

Current and historical water demands in the Riverside Basin have been met through a combination of supplies, including groundwater within Riverside Basin, groundwater outside Riverside Basin (Bunker Hill, Lytle, Colton, and Chino basins), imported water, recycled water, surface water, and other sources, as shown in Figure 3.18. Riverside Basin groundwater is an important component of the supply mix, providing the following, based on 2009 data:

- 14 percent of Colton's water supply
- 2 percent of Jurupa's water supply
- 49 percent of Riverside's water supply
- 62 percent of Riverside Highland's water supply
- 100 percent of Rubidoux's water supply
- 4 percent of West Valley's water supply
- 100 percent of private groundwater producers' water supply

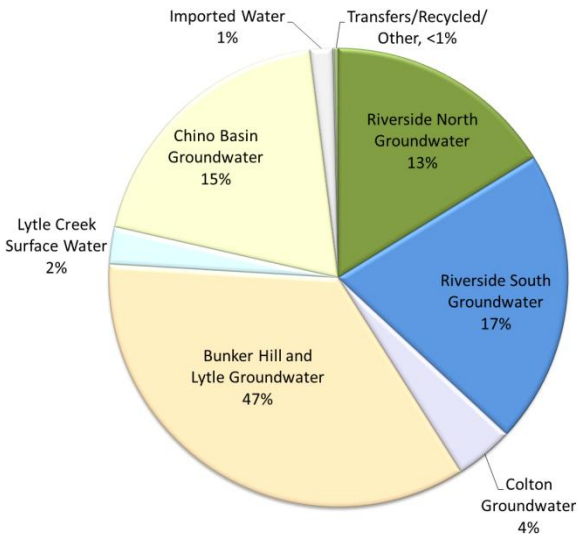


Figure 3.18
Riverside Basin Stakeholders Current Water Supply Sources

Figure 3.19 shows Riverside Basin groundwater production by agency. Figure 3.20 shows the distribution of groundwater production throughout the Riverside Basin over the 2005-2009 time period. Table 3.2 shows total annual groundwater production in the Riverside Basin by major producer. Table 3.3 and Table 3.4 break down the total Riverside Basin production into Riverside North and Riverside South, respectively. Figure 3.21 shows total Riverside Basin groundwater production from Riverside North and Riverside South. In 2009, total groundwater production from the Riverside Basin was 61,728 AF (Watermaster, 2010a).

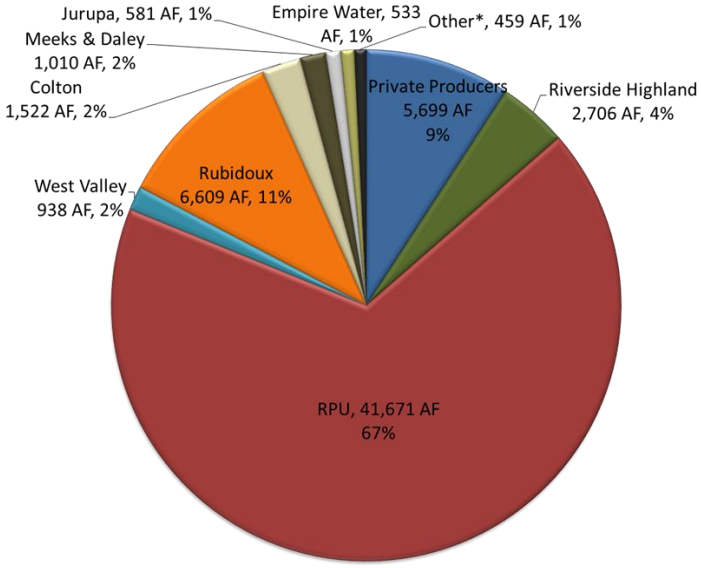
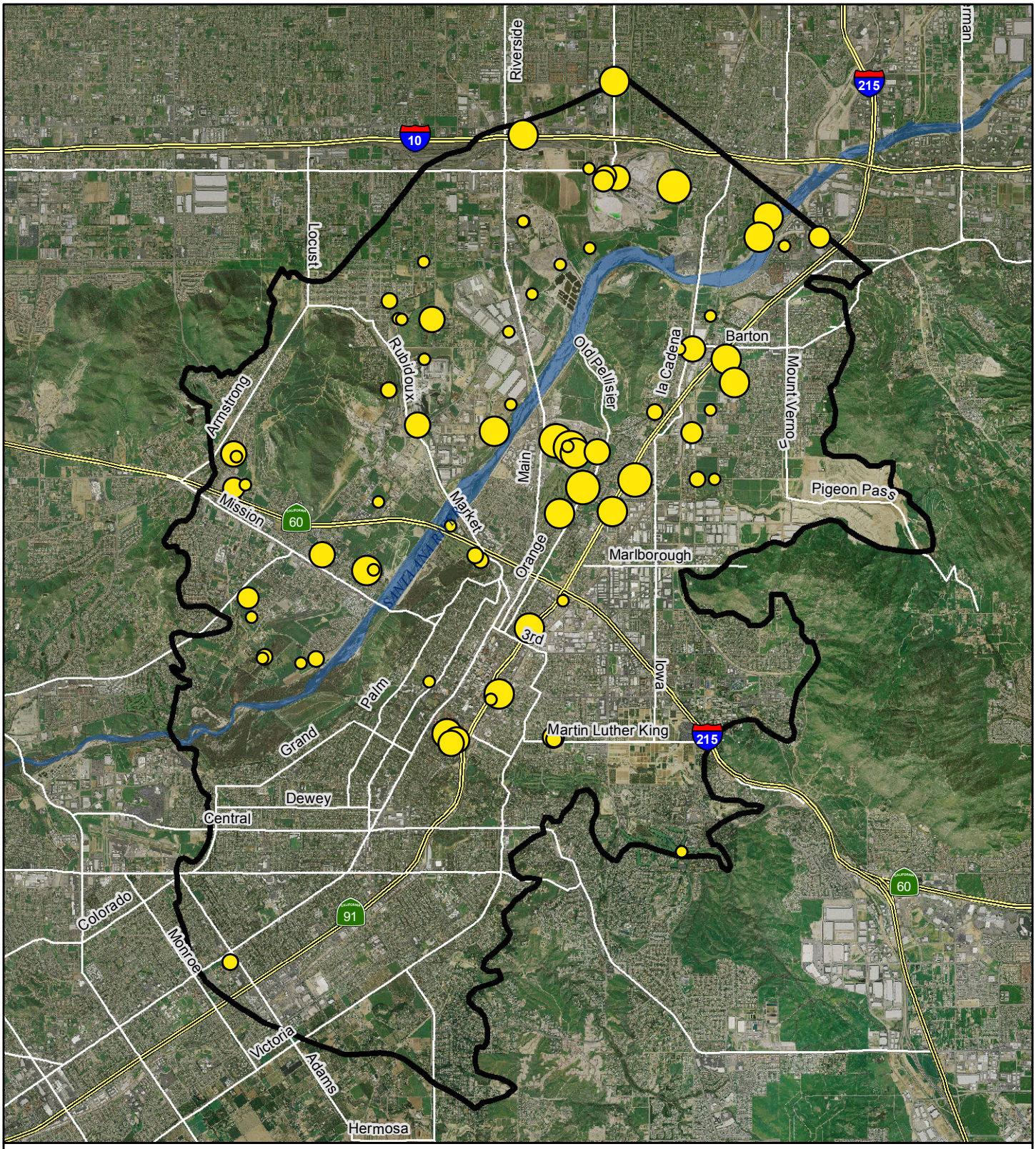


Figure 3.19
Groundwater Production by Agency, 2009



Legend

- Plan Area
- Highways
- Roads

Groundwater Production (afy)

- 1 - 100
- 101 - 250
- 251 - 500
- 501 - 1000
- 1001 - 2000
- > 2001

* Groundwater Production Data Source: Western-San Bernardino Watermaster, 2010

N W E S

0 0.5 1 2 Miles

CITY OF RIVERSIDE

Groundwater Production, Average for 2005 to 2009

Riverside Basin Groundwater Management Plan

2010

Figure 3.20

Table 3.2 Annual Riverside Basin Groundwater Production by Agency (AF)

Year	Colton	Empire	Jurupa	Meeks & Daley	RPU*	Riverside Highland	Rubidoux	West Valley	Other	Private	Western*	Total
1965	0	3,148	1,691	1,223	23,853	4,852	1,372	1,275	5,888	14,168		57,470
1966	0	3,154	1,620	1,485	20,202	5,002	1,979	1,216	4,873	14,243		53,774
1967	0	2,396	1,659	1,308	20,369	4,788	2,861	1,335	4,998	13,516		53,230
1968	0	3,293	1,522	744	22,621	6,532	2,620	1,287	6,518	16,891		62,028
1969	0	309	1,267	706	20,153	6,008	2,547	1,334	3,517	16,577		52,418
1970	0	2,830	603	970	21,056	5,809	3,623	1,240	9,093	13,612		58,836
1971	0	2,219	814	1,948	20,747	7,402	3,639	1,347	8,644	12,859		59,619
1972	0	2,133	830	1,368	29,027	5,597	3,933	1,247	8,114	13,329		65,578
1973	0	885	562	1,614	24,219	5,344	3,658	401	6,160	11,688		54,531
1974	0	1,521	821	821	30,023	4,904	4,130	536	4,577	12,486		59,819
1975	0	1,526	905	2,035	20,783	4,243	4,002	641	4,676	11,810		50,621
1976	0	981	893	2,682	22,993	4,912	4,389	624	5,254	13,193		55,921
1977	0	583	795	2,363	18,887	5,787	4,144	673	5,320	12,827		51,379
1978	0	416	610	1,528	13,215	5,219	4,028	423	3,630	12,359		41,428
1979	0	889	550	2,130	15,709	4,851	3,829	931	4,135	12,109		45,133
1980	0	585	3	1,969	24,210	5,284	3,039	773	3,061	9,451		48,375
1981	0	1,395	0	2,196	23,642	6,237	4,988	865	4,260	9,858		53,441
1982	0	905	0	1,423	15,191	4,483	4,691	689	1,209	8,749		37,340
1983	0	46	0	0	15,424	3,569	4,610	663	1,297	8,920		34,529
1984	0	0	527	1,190	21,831	7,137	5,100	331	1,559	11,440		49,115
1985	0	585	900	1,817	14,273	6,392	4,515	442	1,537	12,375		42,836
1986	0	0	545	2,051	15,449	4,106	4,860	677	1,462	12,256		41,406
1987	0	0	0	1,878	16,051	3,445	4,360	579	987	12,297	12	39,609
1988	0	0	1	2,360	17,929	3,310	5,630	525	1,028	10,053	85	40,921
1989	0	0	397	2,790	33,218	3,987	5,591	447	976	11,670	512	59,588
1990	0	0	310	2,283	32,875	4,404	5,554	469	839	10,946	47	57,727
1991	0	0	203	2,354	32,521	5,069	4,835	577	786	9,061	1,580	56,986
1992	0	0	242	1,714	27,682	3,060	5,282	398	674	8,700	329	48,081
1993	0	2	278	1,698	27,327	3,869	4,800	158	809	8,423	611	47,975
1994	0	2	236	0	28,241	3,900	4,904	303	690	8,786	375	47,437
1995	169	0	266	556	25,827	3,737	4,955	240	607	9,093	635	46,085
1996	990	0	236	25	25,783	2,954	5,588	0	881	8,223	1,112	45,792
1997	1,767	0	37	97	28,633	2,963	5,733	839	1,195	6,904	1,149	49,317
1998	1,883	0	28	194	26,815	2,521	5,239	1,132	954	6,499	2,038	47,303
1999	1,902	0	33	0	29,834	3,110	6,084	2,021	1,291	6,589	4,986	55,850
2000	1866	0	26	1,037	29,327	2,312	6,627	2,224	1,243	7,108	3,143	54,913
2001	1,832	0	707	252	28,405	1,992	6,689	2,116	1,191	6,372	2,666	52,222
2002	268	0	703	2,417	26,386	3,395	6,320	1,945	1,241	5,938	2,509	51,122
2003	313	2	758	1,299	27,344	2,369	6,274	1,779	768	6,362	1,481	48,749
2004	1,235	221	563	159	31,564	3,101	6,728	1,914	671	6,269	0	52,425
2005	2,133	487	723	1	31,369	2,721	6,395	1,347	607	6,054	217	52,054
2006	1,690	515	559	515	33,208	1,361	6,998	1,340	603	6,087	285	53,161
2007	1,664	563	587	788	35,742	2,224	7,270	2,570	303	6,408	42	58,161
2008	1,070	575	603	2,043	32,417	1,645	6,702	2,269	366	5,735	11	53,436
2009	1,522	533	581	1,010	38,276	2,706	6,609	938	459	5,699	3,395	61,728

* Western production is purchased groundwater produced by RPU and delivered via the Riverside Canal/Jefferson Pump Station where it is exported from the basin. RPU production in this table does not include this water sold to Western. Water may have been provided by RPU to Western prior to 1987, but these deliveries were not metered and volumes are unknown.

Table 3.3 Annual Riverside North Groundwater Production by Agency (AF)

Year	Colton	Empire	Meeks & Daley	RPU*	Riverside Highland	West Valley	Other	Private	Western*	Total
1965	0	3,148	1,223	8,619	3,234	1,275	4,710	7,663		29,872
1966	0	3,154	1,485	5,164	3,546	1,216	3,754	8,402		26,721
1967	0	2,396	1,308	6,442	3,434	1,335	3,923	7,753		26,591
1968	0	3,293	744	9,919	4,664	1,287	5,308	9,798		35,013
1969	0	309	706	7,163	4,755	1,334	2,768	9,156		26,191
1970	0	2,830	970	4,191	4,360	1,240	6,017	7,216		26,824
1971	0	2,219	1,948	5,104	5,304	1,347	6,229	6,860		29,011
1972	0	2,133	1,368	6,698	4,229	1,247	5,589	6,824		28,088
1973	0	885	1,614	5,208	4,074	401	3,494	6,065		21,741
1974	0	1,521	821	6,595	3,371	536	3,056	5,895		21,795
1975	0	1,526	2,035	6,483	3,016	641	2,950	5,978		22,629
1976	0	981	2,682	6,785	3,592	624	3,432	6,542		24,638
1977	0	583	2,363	4,501	4,699	673	3,625	6,987		23,431
1978	0	416	1,528	1,013	3,923	423	2,295	7,542		17,140
1979	0	889	2,130	1,015	3,876	931	2,692	8,386		19,919
1980	0	585	1,969	3,635	4,284	773	1,705	5,507		18,458
1981	0	1,395	2,196	5,361	4,965	865	2,875	5,878		23,535
1982	0	905	1,423	5,260	3,330	689	437	5,229		17,273
1983	0	46	0	3,600	2,536	663	275	4,708		11,828
1984	0	0	1,190	4,937	4,545	331	335	5,747		17,085
1985	0	585	1,817	5,054	4,475	442	363	6,580		19,316
1986	0	0	2,051	4,235	2,089	677	341	7,868		17,261
1987	0	0	1,878	3,752	1,632	579	274	7,680	6	15,801
1988	0	0	2,360	5,462	1,785	525	381	6,303	43	16,858
1989	0	0	2,790	11,903	2,558	447	350	7,252	256	25,556
1990	0	0	2,283	12,922	2,858	469	328	7,487	24	26,370
1991	0	0	2,354	14,147	3,581	577	303	6,258	790	28,010
1992	0	0	1,714	11,836	2,215	398	191	5,441	165	21,959
1993	0	2	1,698	11,018	3,034	158	319	5,332	306	21,866
1994	0	2	0	10,044	3,285	303	276	5,564	188	19,661
1995	169	0	556	12,102	3,126	240	218	7,137	318	23,865
1996	990	0	25	10,214	2,396	0	369	6,710	556	21,260
1997	1,767	0	97	9,186	2,513	839	445	5,122	575	20,543
1998	1,883	0	194	7,569	2,195	1,132	232	4,830	1,019	19,054
1999	1,902	0	0	8,441	2,627	2,021	356	4,521	2,493	22,361
2000	1,866	0	1,037	8,722	2,225	2,224	367	5,000	1,572	23,012
2001	1,832	0	252	7,446	1,336	2,116	297	4,318	1,333	18,930
2002	268	0	2,417	7,846	2,577	1,945	290	3,903	1,255	20,500
2003	313	0	1,299	6,989	1,885	1,779	226	4,927	741	18,158
2004	1,235	0	159	6,248	2,793	1,914	209	4,691	0	17,249
2005	2,133	0	1	9,075	2,090	1,347	167	4,792	109	19,713
2006	1,690	0	515	12,103	1,265	1,340	164	5,333	143	22,552
2007	1,664	0	788	7,537	2,199	2,570	2	5,522	21	20,303
2008	1,070	0	2,043	10,646	1,645	2,269	2	5,115	6	22,795
2009	1,522	0	1,010	13,517	2,706	938	1	5,059	1,698	26,451

* Western production is purchased groundwater produced by RPU and delivered via the Riverside Canal/Jefferson Pump Station where it is exported from the basin. RPU production in this table does not include this water sold to Western. Water may have been provided by RPU to Western prior to 1987, but these deliveries were not metered and volumes are unknown.

Table 3.4 Annual Riverside South Groundwater Production by Agency (AF)

Year	Empire	Jurupa	RPU*	Riverside Highland	Rubidoux	Other	Private	Western*	Total
1965	0	1,691	15,234	1,618	1,372	1,178	6,505		27,598
1966	0	1,620	15,038	1,456	1,979	1,119	5,841		27,053
1967	0	1,659	13,927	1,354	2,861	1,075	5,763		26,639
1968	0	1,522	12,702	1,868	2,620	1,210	7,093		27,015
1969	0	1,267	12,990	1,253	2,547	749	7,421		26,227
1970	0	603	16,865	1,449	3,623	3,076	6,396		32,012
1971	0	814	15,643	2,098	3,639	2,415	5,999		30,608
1972	0	830	22,329	1,368	3,933	2,525	6,505		37,490
1973	0	562	19,011	1,270	3,658	2,666	5,623		32,790
1974	0	821	23,428	1,533	4,130	1,521	6,591		38,024
1975	0	905	14,300	1,227	4,002	1,726	5,832		27,992
1976	0	893	16,208	1,320	4,389	1,822	6,651		31,283
1977	0	795	14,386	1,088	4,144	1,695	5,840		27,948
1978	0	610	12,202	1,296	4,028	1,335	4,817		24,288
1979	0	550	14,694	975	3,829	1,443	3,723		25,214
1980	0	3	20,575	1,000	3,039	1,356	3,944		29,917
1981	0	0	18,281	1,272	4,988	1,385	3,980		29,906
1982	0	0	9,931	1,153	4,691	772	3,520		20,067
1983	0	0	11,824	1,033	4,610	1,022	4,212		22,701
1984	0	527	16,894	2,592	5,100	1,224	5,693		32,030
1985	0	900	9,219	1,917	4,515	1,174	5,795		23,520
1986	0	545	11,214	2,017	4,860	1,121	4,388		24,145
1987	0	0	12,299	1,813	4,360	713	4,617	6	23,808
1988	0	1	12,468	1,525	5,630	647	3,750	43	24,063
1989	0	397	21,315	1,429	5,591	626	4,418	256	34,032
1990	0	310	19,954	1,546	5,554	511	3,459	24	31,357
1991	0	203	18,374	1,488	4,835	483	2,803	790	28,976
1992	0	242	15,847	845	5,282	483	3,259	165	26,122
1993	0	278	16,310	835	4,800	490	3,091	306	26,109
1994	0	236	18,198	615	4,904	414	3,222	188	27,776
1995	0	266	13,726	611	4,955	389	1,956	318	22,220
1996	0	236	15,569	558	5,588	512	1,513	556	24,532
1997	0	37	19,448	450	5,733	750	1,782	575	28,774
1998	0	28	19,246	326	5,239	722	1,669	1019	28,249
1999	0	33	21,393	483	6,084	935	2,068	2,493	33,489
2000	0	26	20,606	87	6,627	876	2,108	1,572	31,901
2001	0	707	20,959	656	6,689	894	2,054	1333	33,292
2002	0	703	18,541	818	6,320	951	2,035	1,255	30,622
2003	2	758	20,356	484	6,274	542	1,435	741	30,591
2004	221	563	25,316	308	6,728	462	1,578	0	35,176
2005	487	723	22,295	631	6,395	440	1,262	109	32,341
2006	515	559	21,106	96	6,998	439	754	143	30,609
2007	563	587	28,205	25	7,270	301	886	21	37,858
2008	575	603	21,772	0	6,702	364	620	6	30,641
2009	533	581	24,758	0	6,609	458	640	1,698	35,277

* Western production is purchased groundwater produced by RPU and delivered via the Riverside Canal/Jefferson Pump Station where it is exported from the basin. RPU production in this table does not include this water sold to Western. Water may have been provided by RPU to Western prior to 1987, but these deliveries were not metered and volumes are unknown.

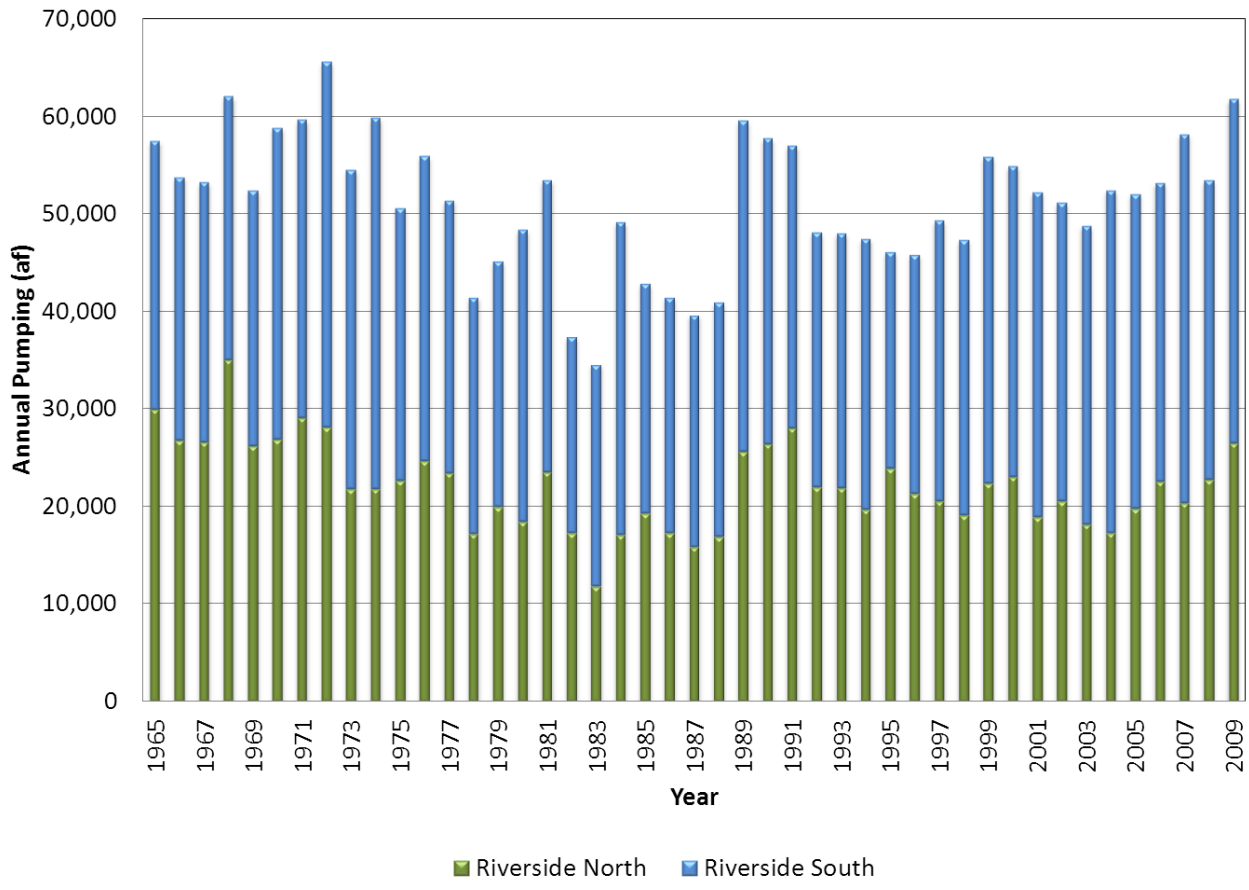


Figure 3.21
Historical Annual Riverside North and South Groundwater Production

3.2 PROJECTED WATER REQUIREMENTS AND SUPPLIES

Increasing water demand is anticipated throughout the Riverside Basin in the future. As part of a diversified water portfolio, Riverside Basin groundwater supplies, in addition to the current level of groundwater supplies, are projected to contribute toward meeting that additional demand. Table 3.5 presents the projected increase in Riverside Basin groundwater production by entity.

Table 3.5
Current and Projected Riverside Basin Groundwater Production by Entity in the Riverside Basin (AFY)

Agency	Current*	Projections			
		2015	2020	2025	2030
Colton	1,522	1,496	1,450	1,495	1,584
Jurupa	581	600	600	600	600
RPU	41,671	32,074	37,274	41,674	46,474
Riverside Highland	2,706	4,200	4,200	4,200	4,200
Rubidoux	6,609	9,820	10,520	10,600	10,600
West Valley**	938	2,000	2,000	2,500	3,000
Private	5,699	5,990	5,990	5,990	5,990
Other***	2,002	1,880	1,880	1,880	1,880
Total Riverside Basin	**61,728**	**58,060**	**63,714**	**68,939**	**74,328**
Riverside North	26,451	24,796	29,750	30,295	30,884
Riverside South	35,277	33,264	34,164	38,644	43,444

* Agency data based on 2009 data (Watermaster, 2010a).

** West Valley's projected production includes production within the DWR-defined Riverside-Arlington Basin but outside of the 1969 Western Judgment-defined Riverside Basin. Current West Valley production from the DWR-defined Riverside-Arlington Basin is 2,118 AF.

*** Other includes smaller agencies without projections, including Empire and Meeks & Daley.

The values in Table 3.5 are based on comparisons of IRWMP or 2010 UWMP projected values and current groundwater production and on the following assumptions:

- Current groundwater production for all entities is based on records from Watermaster.
- Colton's projected groundwater production from the Riverside Basin is as identified in the draft *2010 San Bernardino Regional Urban Water Management Plan* (Kennedy/Jenks Consultants, 2011a).
- Jurupa's projected groundwater production from the Riverside Basin is as identified in Jurupa's 2010 UWMP (Kennedy/Jenks Consultants, 2011b).
- Riverside's projected groundwater production from the Riverside Basin is as identified in RPU's 2010 UWMP (RPU, 2010).
- Rubidoux's projected groundwater production from the Riverside Basin is as identified in the Western IRWMP (Western, 2008).
- Riverside Highland's projected groundwater production from the Riverside Basin is as identified in the analysis performed for its 2010 UWMP.
- West Valley's projected groundwater production from the Riverside Basin is as identified in the draft *2010 San Bernardino Regional Urban Water Management Plan* (Kennedy/Jenks Consultants, 2011a).
- Private production and "Other" production are assumed to remain at the average production over the 2005-2009 period. "Other" includes other groundwater producers discussed in Section 3.1.4 as well as Meeks & Daley and Empire.

Figure 3.22 illustrates total water served currently as well as projections to 2030 by the primary retail water agencies in the Riverside Basin.

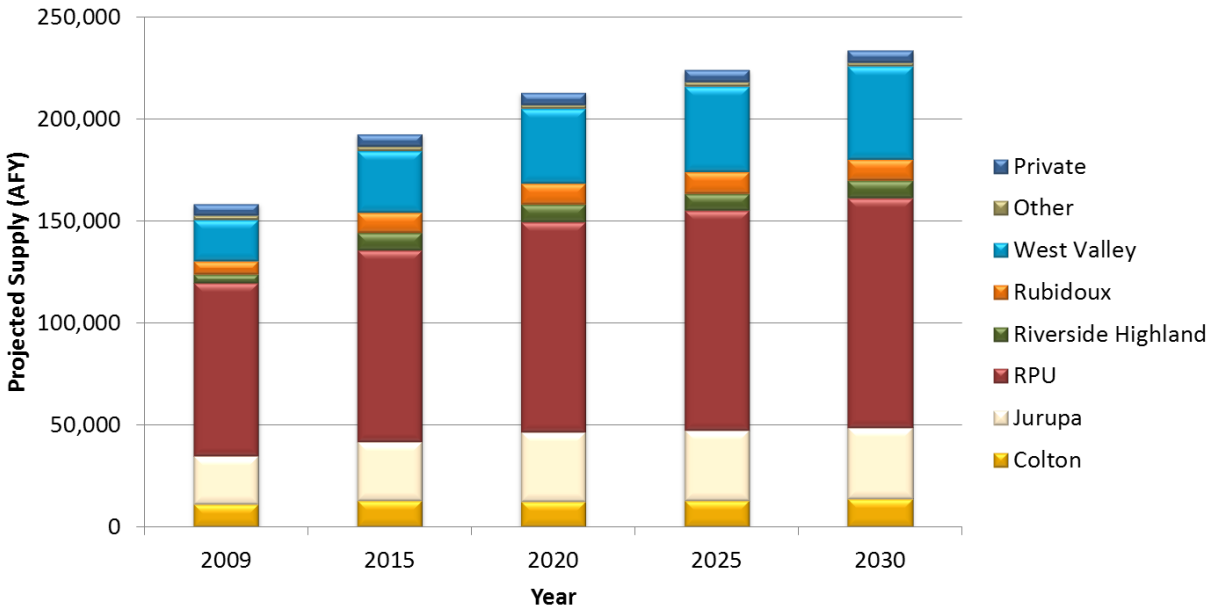


Figure 3.22
Current and Projected Water Supplies for Retail Water Agencies that Serve the Riverside Basin and for Riverside Basin Private Users

The water served by retail water agencies includes groundwater from the Riverside Basin and other basins, as well as imported water, local surface water, transfers, and recycled water. Users are both within and outside of the Riverside Basin. The growth in overall water demand suggests that there will be a need to maintain some level of Riverside Basin groundwater production to meet future demands. Alternate water supplies (imported water, desalted water, recycled water, groundwater from outside the basin, or conservation) tend to be more expensive, of limited quantity, or both. Agencies intend to utilize a mix of increased supply sources and conservation to meet 2030 demands, with Riverside Basin groundwater continuing to be an important component.

The projected Riverside Basin supplies, split into Riverside North and Riverside South, are shown in Figure 3.23 with the historical production discussed in Section 3.1.

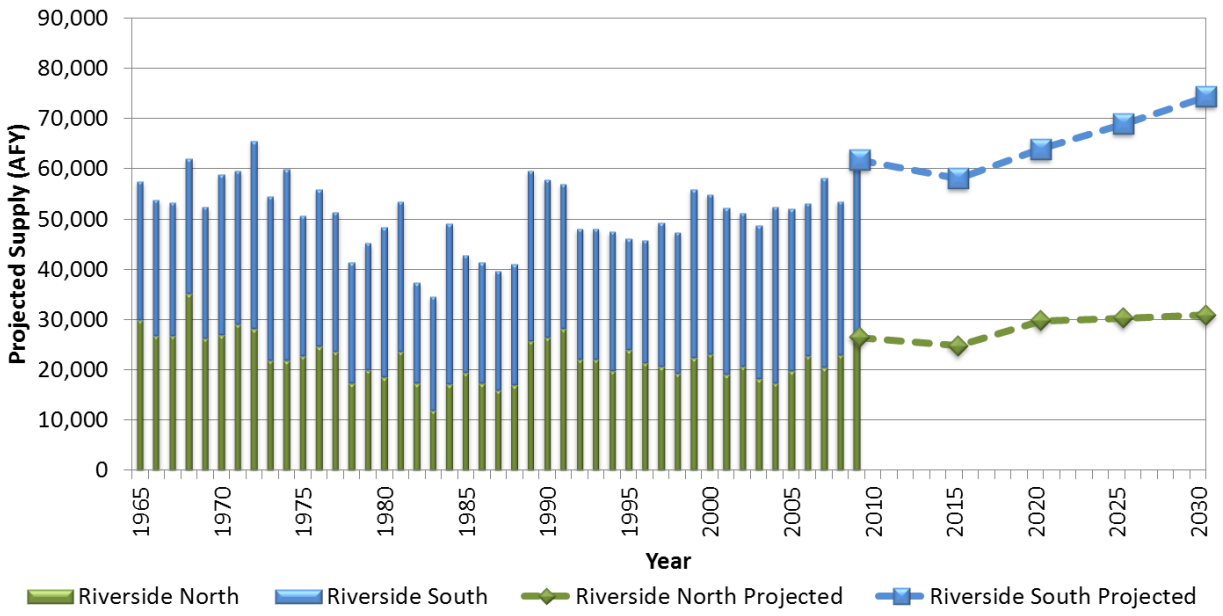


Figure 3.23
Riverside Basin Historical and Projected Groundwater Supply

Reported IRWMP and UWMP information, scaled by historical data where necessary, was also used to compile the projected water supplies by supply type, as shown in Figure 3.24.

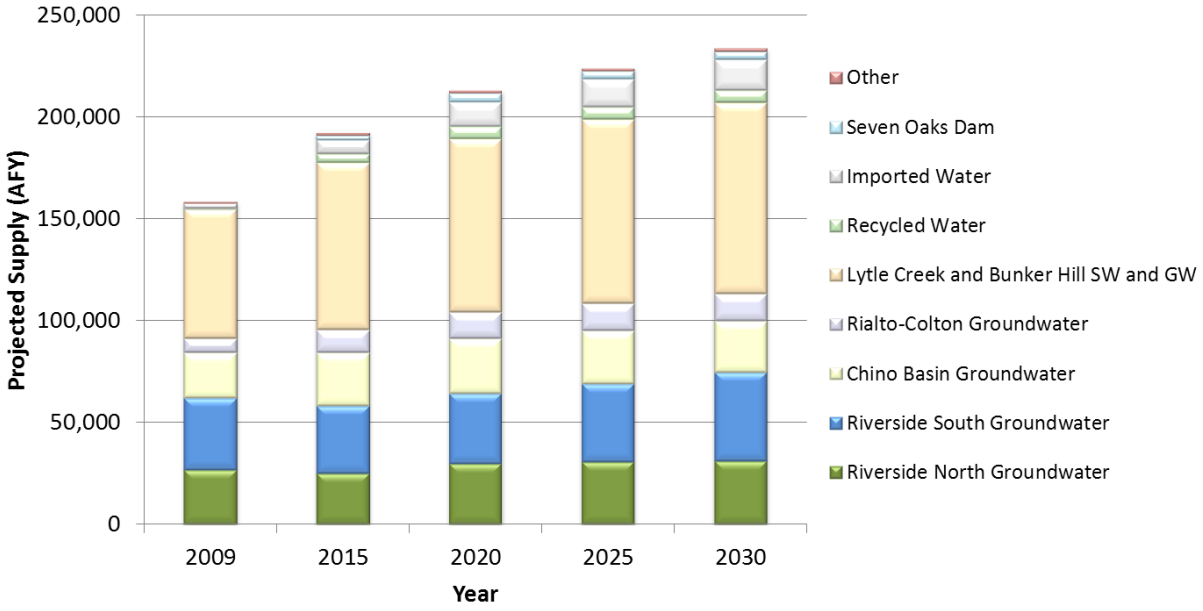


Figure 3.24
Riverside Basin Projected Water Supplies by Supply Type

3.2.1 AGENCY WATER PROJECTIONS

Details of the water supply projections for each individual retail water agency, as well as private pumpers, are provided in the following sections. The projections are for supplies for the entire agency, not solely the Plan Area.

3.2.1.1 Colton

Water supplies for Colton are projected to increase from 11,136 AF in 2009 to 13,770 AF in 2030 (Watermaster, 2010; Kennedy/Jenks Consultants, 2011a), as shown in Figure 3.25. Colton anticipates continuing to meet demands through groundwater supplies in the Bunker Hill, Colton, and Riverside basins. Riverside Basin production will be from Riverside North and is projected to increase from 1,522 AF in 2009 (Watermaster, 2010a) to 1,584 AF in 2030 (Kennedy/Jenks Consultants, 2011a). Colton's anticipated increases in Riverside Basin groundwater production are shown in Table 3.6.

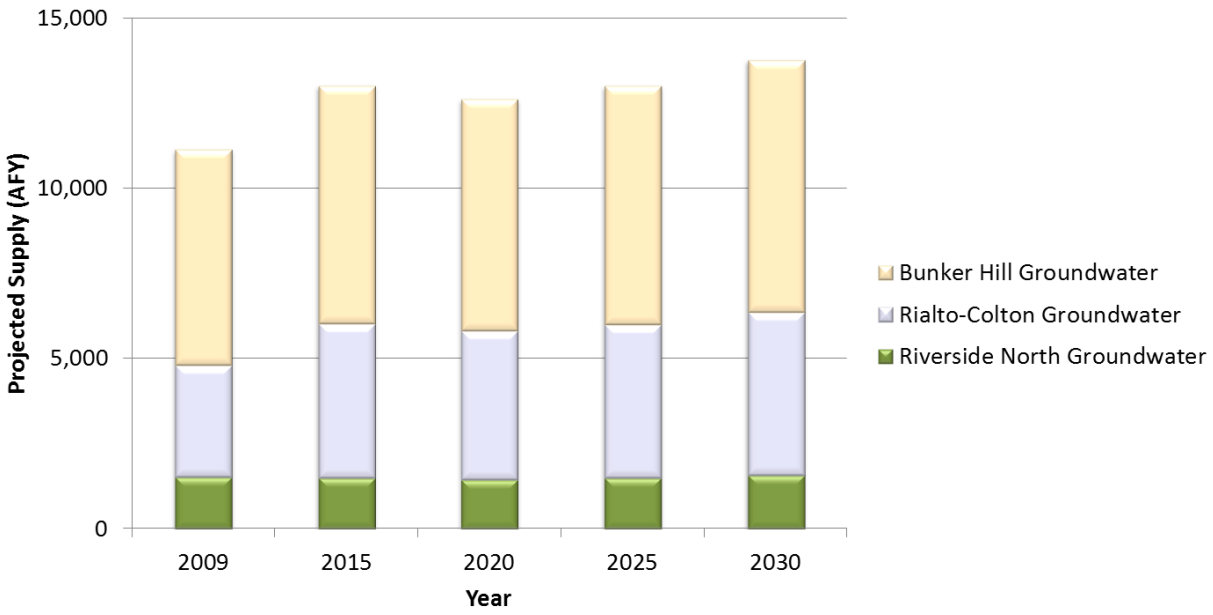


Figure 3.25
Colton Projected Water Supply

Table 3.6
Colton Current and Projected Riverside Basin Groundwater Supplies (AFY)

Source	2009	Projection			
		2015	2020	2025	2030
Riverside North	1,522	1,496	1,450	1,495	1,584
Riverside South	-	-	-	-	-
Total Riverside Basin	**1,522**	**1,496**	**1,450**	**1,495**	**1,584**

3.2.1.2 Jurupa Community Services District

Water supplies for Jurupa are projected to increase from 23,660 AF in 2009 to 35,077 AF in 2030 (Kennedy/Jenks Consultants, 2011b), as shown in Figure 3.26. Only a small portion of the total projected supply will be Riverside Basin groundwater. The following are projected additional sources by 2030:

- 4,300 AFY of groundwater, almost entirely from the Chino Basin, including groundwater from the Chino Basin Desalter I and II
- 8,000 AFY of imported water
- 1,000 AFY of water from Rubidoux

Of the additional groundwater, it is assumed that approximately 2 percent will be produced from Riverside South, based on historical production records (Watermaster, 2010a). Jurupa's projected increases in Riverside Basin groundwater production are shown in Table 3.7.

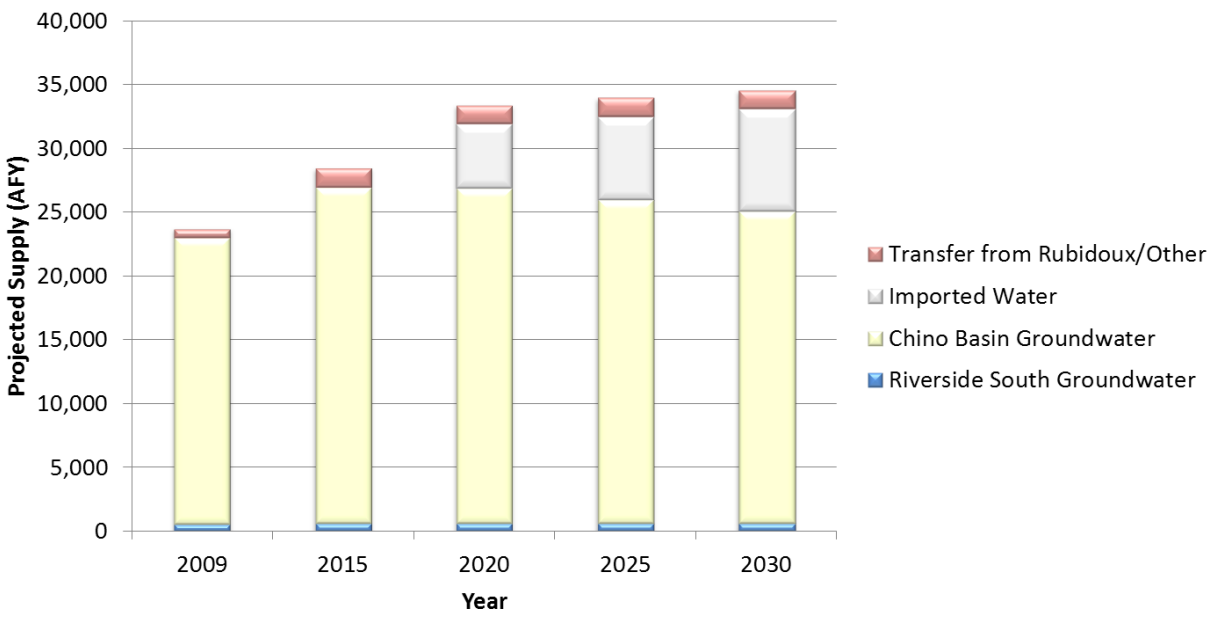


Figure 3.26
Jurupa Projected Water Supply

Table 3.7
Jurupa Current and Projected Riverside Basin Groundwater Supplies (AFY)

Source	2009	Projection			
		2015	2020	2025	2030
Riverside North	-	-	-	-	-
Riverside South	581	600	600	600	600
Total Riverside Basin	**581**	**600**	**600**	**600**	**600**

3.2.1.3 Riverside Public Utilities

Water supplies for RPU are projected to increase from 96,826 AF in 2009 to 119,800 AF in 2030 (RPU, 2011), as shown in Figure 3.27. Additional new water sources to meet future needs include the following:

- 10,000 AFY of water conservation, including toilet retrofits, weather-based irrigation controllers, and turf replacement programs. 3,140 AFY of conservation is expected to be in place by 2015.
- Expansion of the recycled water system to provide 9,800 AFY of recycled water, with a first phase providing 3,650 AFY of recycled water by 2015.
- Substitution of 4,000 AFY of non-potable groundwater to the Upper Gage Canal at UC Riverside, freeing up 4,000 AFY of potable groundwater by 2015.
- Decrease in production from the Riverside Basin of approximately 8,600 AFY. The production shown in Table 3.8 does not include RPU's planned production associated with its conjunctive use projects. Production associated with RPU's conjunctive use projects is discussed in Section 8.
- Decrease in production from Bunker Hill Basin by approximately 6,200 AFY.
- Full participation in the Seven Oaks Dam conservation project, resulting in an additional 4,000 AFY of groundwater production, on average, from the Bunker Hill Basin.
- Development of a well in the Colton Basin to provide 2,700 AFY of supply (RPU, 2011).

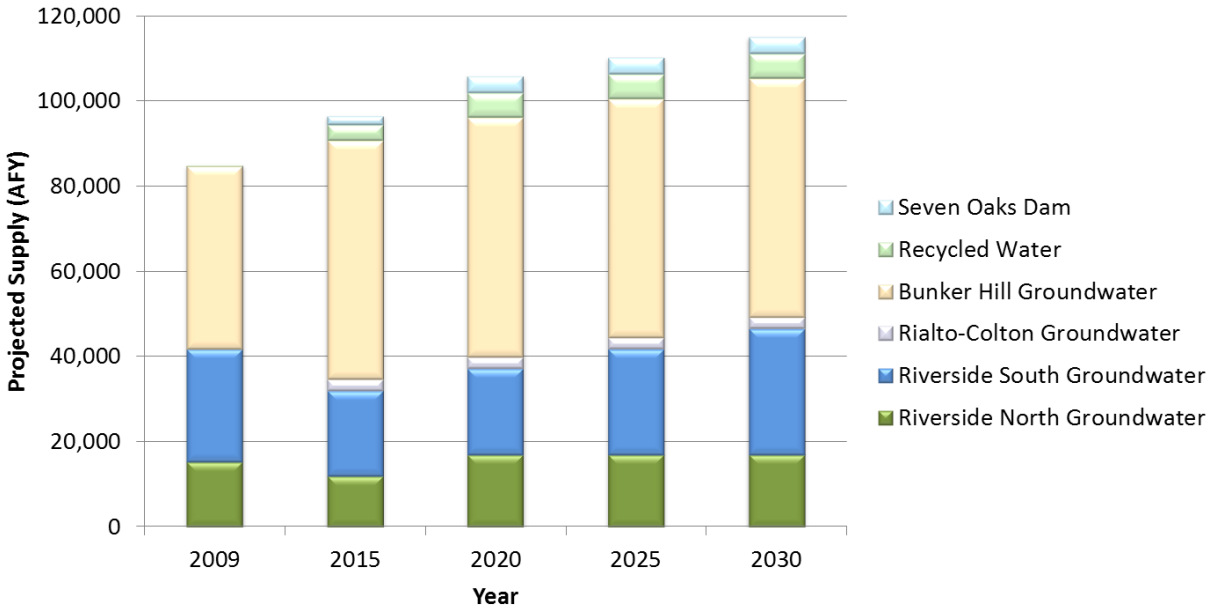


Figure 3.27
RPU Projected Water Supply

New Riverside Basin groundwater production for RPU is planned to be from both Riverside South and Riverside North (RPU, 2011), as shown in Table 3.8.

Table 3.8
RPU Current and Projected Riverside Basin Groundwater Supplies (AFY)

Source	2009	Projection			
		2015	2020	2025	2030
Riverside North	15,215	12,000	17,000	17,000	17,000
Riverside South	26,456	20,074	20,274	24,674	29,474
Total Riverside Basin	**41,671**	**32,074**	**37,274**	**41,674**	**46,474**

3.2.1.4 Riverside Highland Water Company

Water supplies for Riverside Highland are projected to increase from 4,354 AF in 2009 to 8,500 AF in 2030 (Riverside Highland, pers. comm. August 9, 2010), as shown in Figure 3.28. Riverside Highland intends to meet the increase in supplies with groundwater from the Riverside, Bunker Hill, and Lytle Creek basins.

Future supplies from the Bunker Hill and Lytle Creek basins are estimated to be 4,300 AFY (Upper Santa Ana Water Resources Association, 2007). The remainder of additional supplies will be provided by groundwater from Riverside Basin, with the ratio of production from Riverside North and Riverside South based on historical production records from 2004-2008. Riverside Highland's current and projected production for Riverside North and Riverside South is shown in Table 3.9.

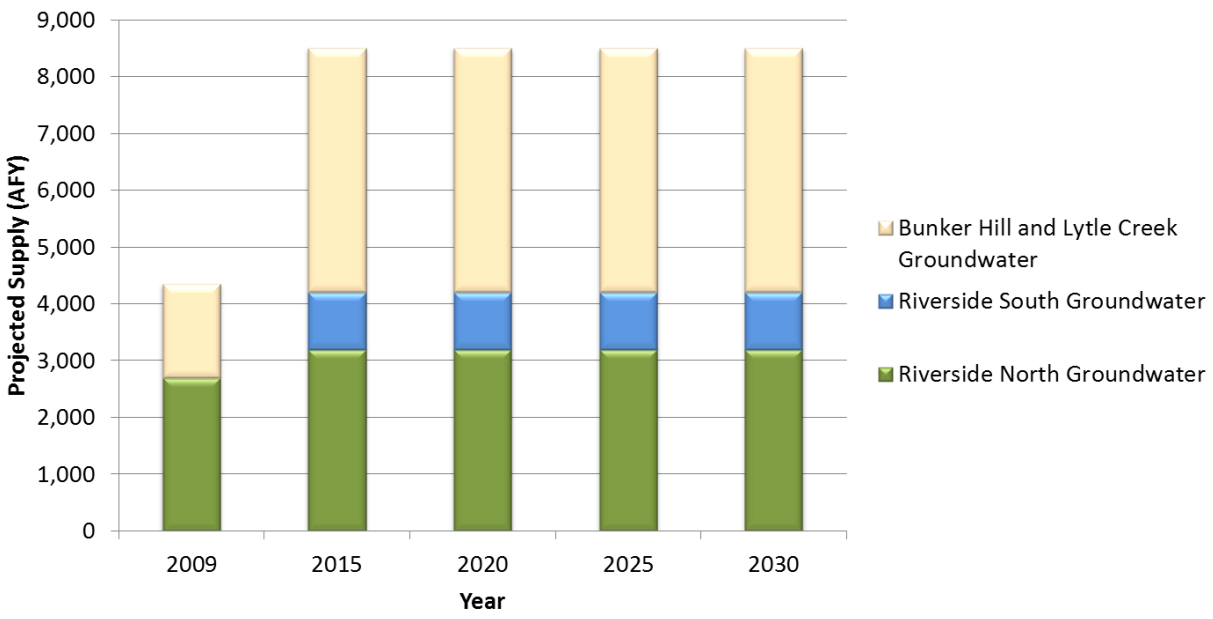


Figure 3.28
Riverside Highland Projected Water Supply

Table 3.9
Riverside Highland Current and Projected Riverside Basin Groundwater Supplies (AFY)

Source	2009	Projection			
		2015	2020	2025	2030
Riverside North	2,706	3,200	3,200	3,200	3,200
Riverside South	-	1,000	1,000	1,000	1,000
Total Riverside Basin	**2,706**	**4,200**	**4,200**	**4,200**	**4,200**

3.2.1.5 Rubidoux Community Services District

Rubidoux's water supply is projected to increase from 6,609 AF in 2009 (Watermaster, 2010a) to 10,600 AF in 2030 (Western 2008), as shown in Figure 3.29. Rubidoux plans to continue to meet its water demands with Riverside Basin groundwater. Rubidoux anticipates construction of two new wells: Well 22 between 2015 and 2020 and Well 23 between 2020 and 2025 (Rubidoux, 2005). All new production will continue to be from Riverside South. Projected increases in Riverside Basin groundwater supplies to Rubidoux are shown in Table 3.10.

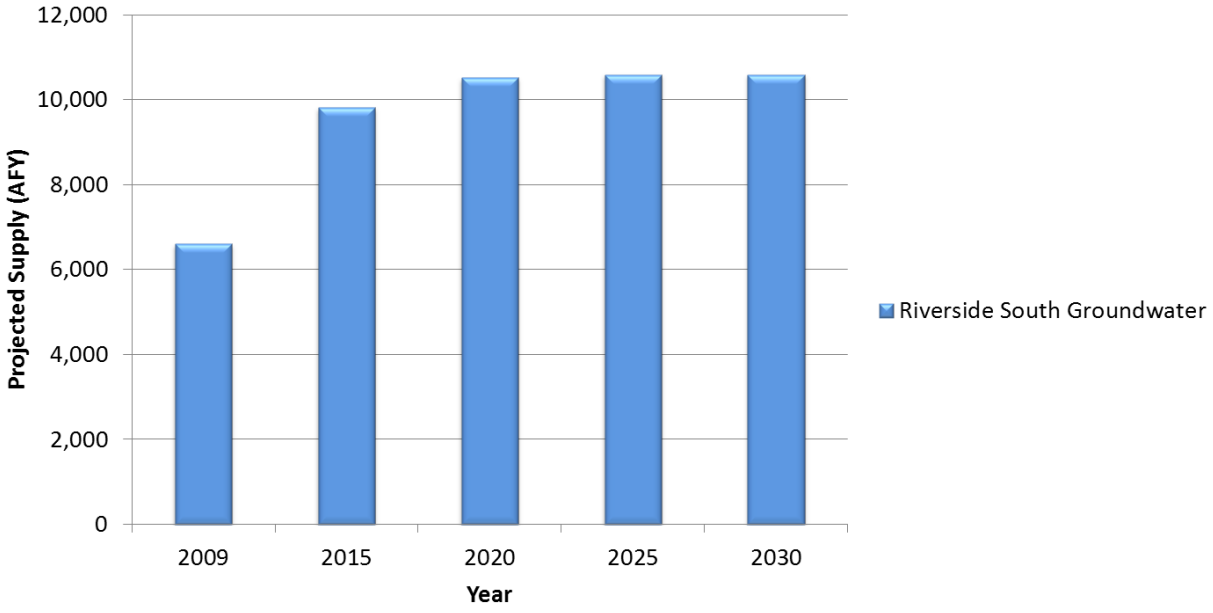


Figure 3.29
Rubidoux Projected Water Supply

Table 3.10
Rubidoux Current and Projected Riverside Basin Groundwater Supplies (AFY)

Source	2009	Projection			
		2015	2020	2025	2030
Riverside North	-	-	-	-	-
Riverside South	6,609	9,820	10,520	10,600	10,600
Total Riverside Basin	**6,609**	**9,820**	**10,520**	**10,600**	**10,600**

3.2.1.6 West Valley Water District

Water supplies for West Valley are projected to increase from 21,582 AF in 2009 to 37,418 AF in 2030 (Kennedy/Jenks Consultants, 2011a); Figure 3.30 shows the projected groundwater production along with the other available water supplies (Kennedy/Jenks Consultants, 2011a). West Valley does not currently plan on developing new water supply sources, but intends to utilize a greater amount from each current source, up to its legal rights, depending on availability. Currently, only Lytle Basin groundwater and Lytle Creek surface water have been fully utilized by West Valley (West Valley, 2005). A large portion of the additional future supply will be provided by Lytle Creek and Bunker Hill groundwater and surface water. All Riverside Basin groundwater production will be from Riverside North. Projected Riverside North groundwater production for West Valley is shown in Table 3.11 (Kennedy/Jenks Consultants, 2011a).

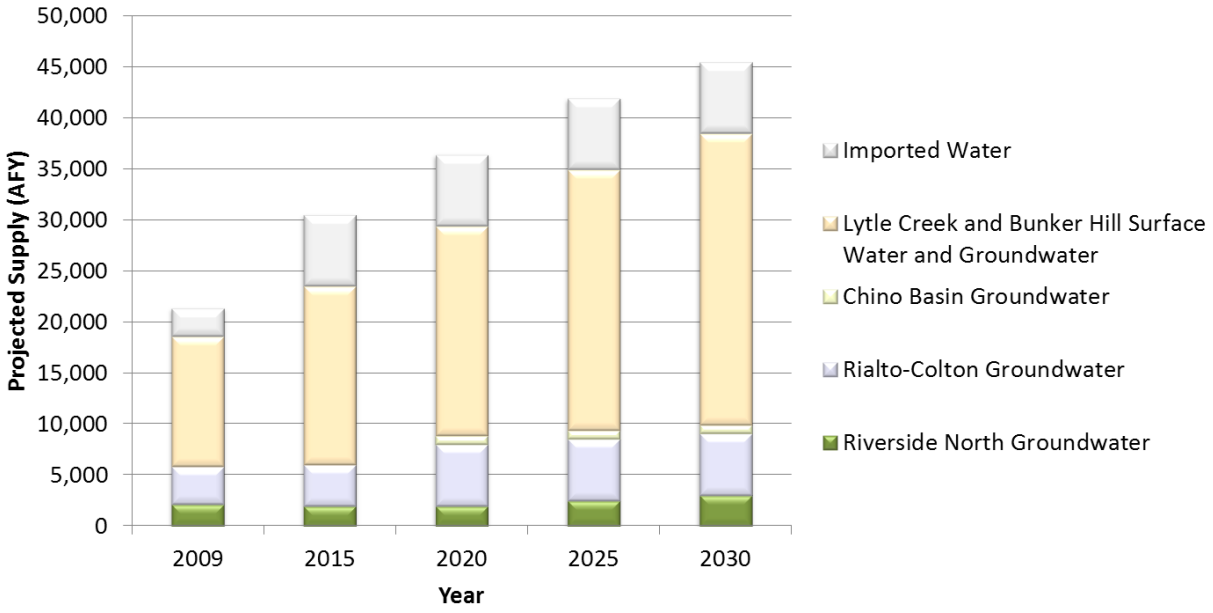


Figure 3.30
West Valley Projected Water Supply

Table 3.11
West Valley Current and Projected Riverside Basin Groundwater Supplies (AFY)

Source	2009	2015	2020	2025	2030
Riverside North	938	2,000	2,000	2,500	3,000
Riverside South	-	-	-	-	-
Total Riverside Basin	**938**	**2,000**	**2,000**	**2,500**	**3,000**

Note: West Valley's projected production includes production within the DWR-defined Riverside-Arlington Basin but outside of the 1969 Western Judgment-defined Riverside Basin. Current West Valley production from the DWR-defined Riverside-Arlington Basin is 2,118 AF.

3.2.2 OTHER GROUNDWATER PRODUCERS

No projections of groundwater use by the smaller water agencies, including Empire and Meeks & Daley are available. Historical trends shown in Table 3.2 indicate an average demand of 1,880 AFY over the past 5 years. Future use is assumed to continue at that level, with production to be evenly split: approximately 940 AFY projected from Riverside North and approximately 940 AFY projected from Riverside South, based on historical trends.

3.2.3 PRIVATE GROUNDWATER PRODUCERS

No projections of private groundwater use are available. Historical trends shown in Table 3.2 indicate an average demand of 5,990 AFY over the past 5 years. Future use is assumed to continue at that level, with approximately 5,160 AFY projected to be produced from Riverside North and 830 AFY projected to be produced from Riverside South, based on historical trends.

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4 GROUNDWATER PRODUCTION AND THE 1969 WESTERN JUDGMENT

Pursuant to the 1969 Western Judgment, the Watermaster produces annual reports that summarize production totals for individual parties for the previous 5-year period. The reporting is inclusive of the Riverside North and South and the distribution of extracted groundwater within individual agency service areas. These values, along with accumulated credits and recorded water levels, are used to determine recharge obligations, if any, by Western and Valley District. This section presents the historical data and applies the projected water supplies to the framework of the 1969 Western Judgment.

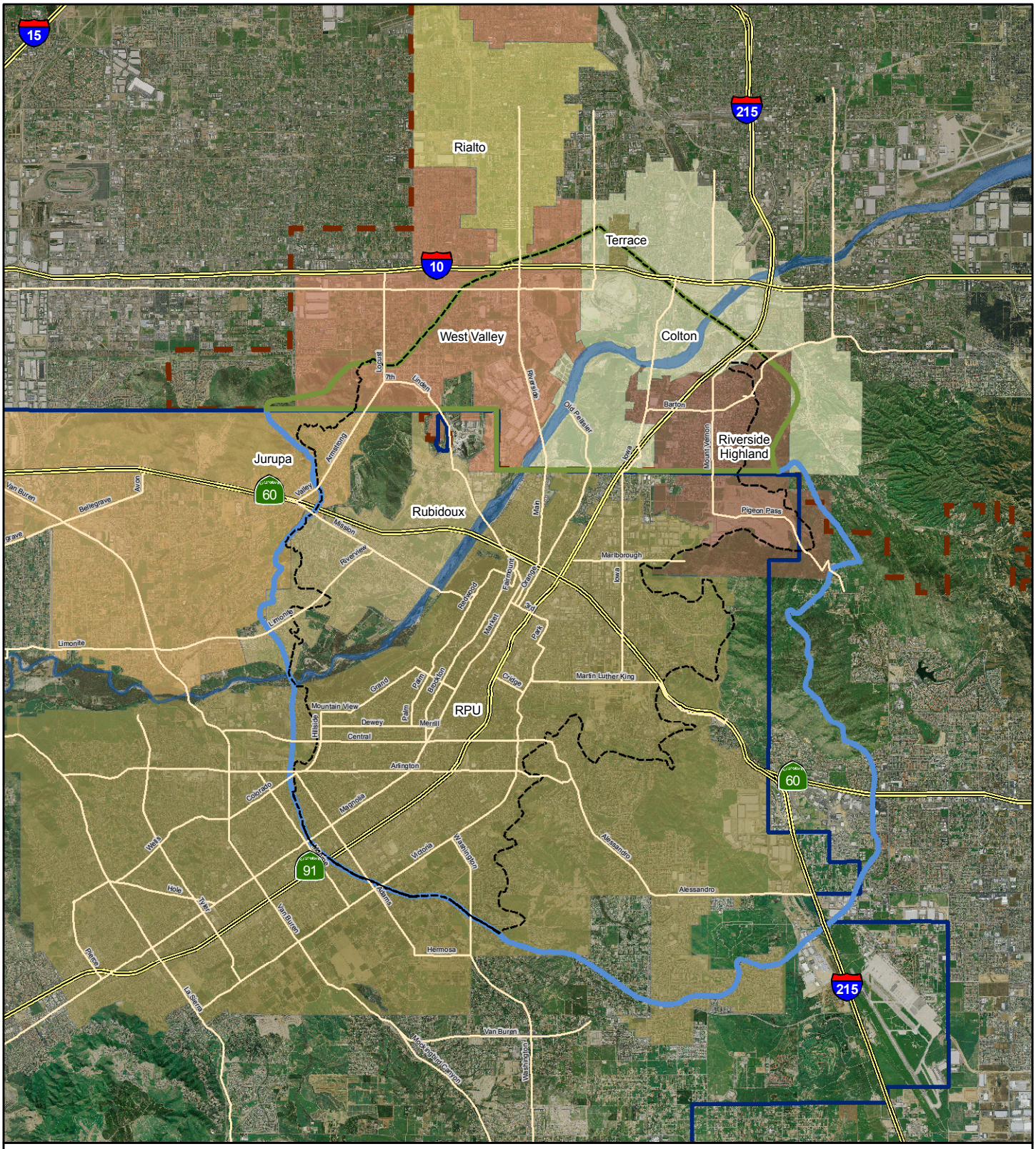
4.1 HISTORICAL PRODUCTION

The 1969 Western Judgment further implements the physical solution provided for in the Orange County Judgment, as well as determines the rights of Plaintiffs to extract from the SBBA and provides for replenishment in the area above Riverside Narrows. The presiding judge appoints the Watermaster Committee, which is comprised of two members: one nominated by Valley District and one by Western. The basis for establishment of extraction rights (Base Rights) stipulated within the 1969 Western Judgment was groundwater production over the 5-year period from 1959 through 1963 (Base Period). The 1969 Western Judgment divides the Riverside Basin into two areas, based on jurisdictional boundaries: the portion of the Riverside Basin in San Bernardino County (Riverside North) and the portion of the Riverside Basin in Riverside County (Riverside South). The boundaries of Riverside North and Riverside South, in relation to the Plan Area and the water agencies, are shown in Figure 4.1.

The following subsections present the development of Base Rights and base period averages along with comparisons of historical verified extractions to these values for Riverside North and Riverside South, and the implications of projected increases in Riverside Basin groundwater production.

4.1.1 RIVERSIDE NORTH

For Riverside North, Base Rights for groundwater extraction are set only for extractions that are used within Riverside County. Extractions from Riverside North for use within San Bernardino Valley are not limited. The data for such extractions are presented in this subsection for informational purposes to provide a complete picture of groundwater production related to Riverside North.



CITY OF RIVERSIDE

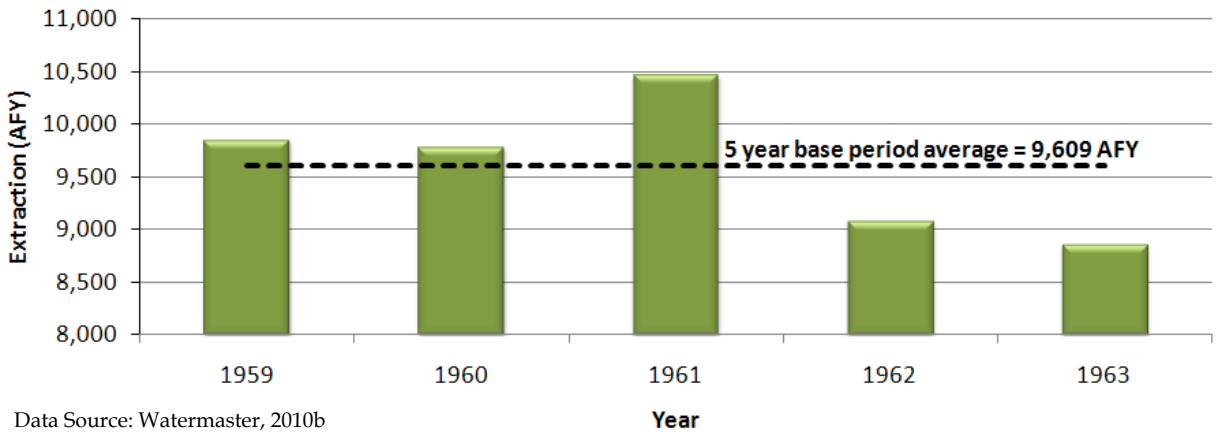
Boundaries of Riverside North and Riverside South

Riverside Basin Groundwater Management Plan

2011

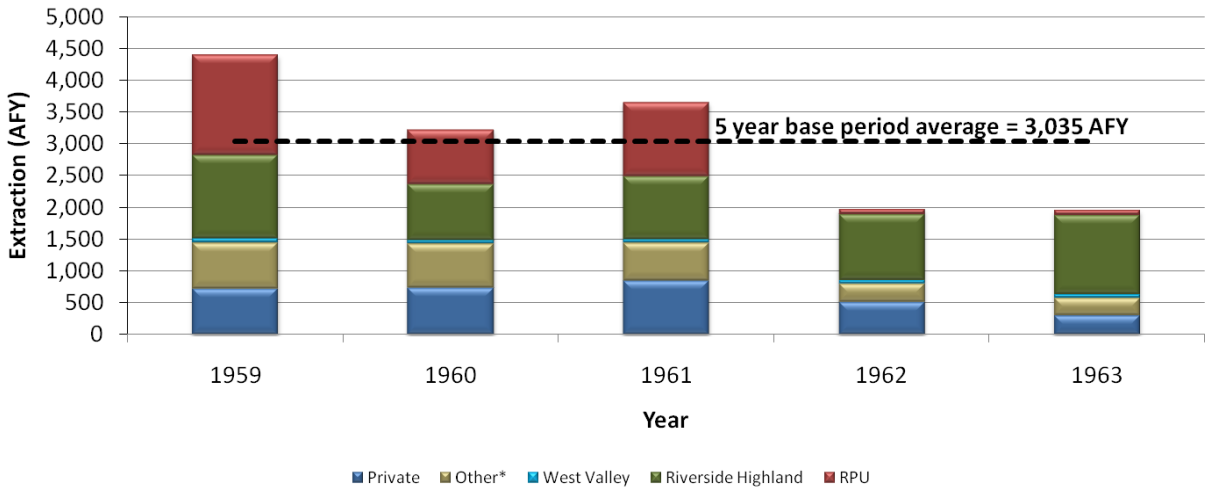
Figure 4.1

The 1969 Western Judgment reported that the 5-year Base Period Average extraction from Riverside North was 33,729 AF, of which 9,609 AF was extracted by San Bernardino County entities (Figure 4.2), 3,035 AF was extracted by Riverside County entities for use in San Bernardino County (Figure 4.3 and Table 4.1), and 21,085 AF was extracted by Riverside County entities for use in Riverside County (Figure 4.4 and Table 4-2). 21,085 AF was established as the Base Rights for use of Riverside North groundwater in Riverside County.



Data Source: Watermaster, 2010b

Figure 4.2
Base Period Extractions from Riverside North by San Bernardino County Entities

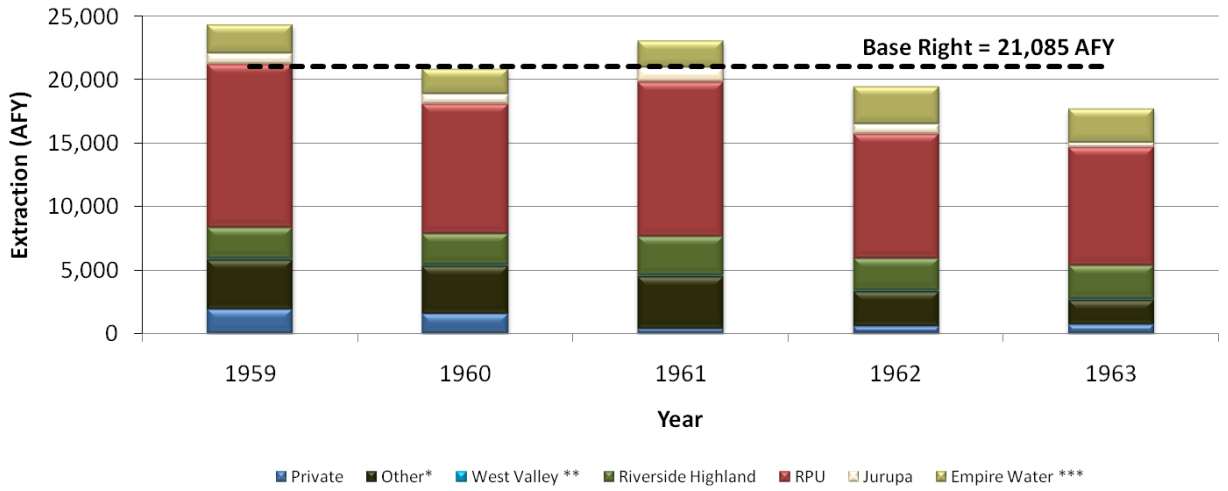


Data Source: Watermaster, 2010b
* Agencies listed as "other" have an average of less than 350 AFY between 1990 and 2007

Figure 4.3
Base Period Extractions from Riverside North by Riverside County Entities for use in San Bernardino County, by Entity

Table 4.1
Base Period Extractions from Riverside North by Riverside County Entities for use in San Bernardino County, by Entity (AF)

Entity	1959	1960	1961	1962	1963	Average
RPU	1,581	852	1,171	81	84	754
Riverside Highland	1,317	890	994	1,043	1,246	1,098
West Valley	57	55	52	46	51	52
Other	725	698	598	289	274	517
Private	713	719	832	510	298	614
Total	**4,393**	**3,214**	**3,647**	**1,969**	**1,953**	**3,035**



Data Source: Watermaster, 2010b
* Agencies listed as "other" have an average of less than 350 AFY between 1990 and 2007
** West Valley (formerly Inter County Water Co.) appears in this figure (average of 81 AFY) as a small portion of its service area is within Riverside County
*** Extraction by the former West Riverside 350 Inch Water Company

Figure 4.4
Base Period Extractions from Riverside North by Riverside County Entities for use in Riverside County, by Entity

Table 4.2
Base Period Extractions from Riverside North by Riverside County Entities for use in Riverside County, by Entity (AF)

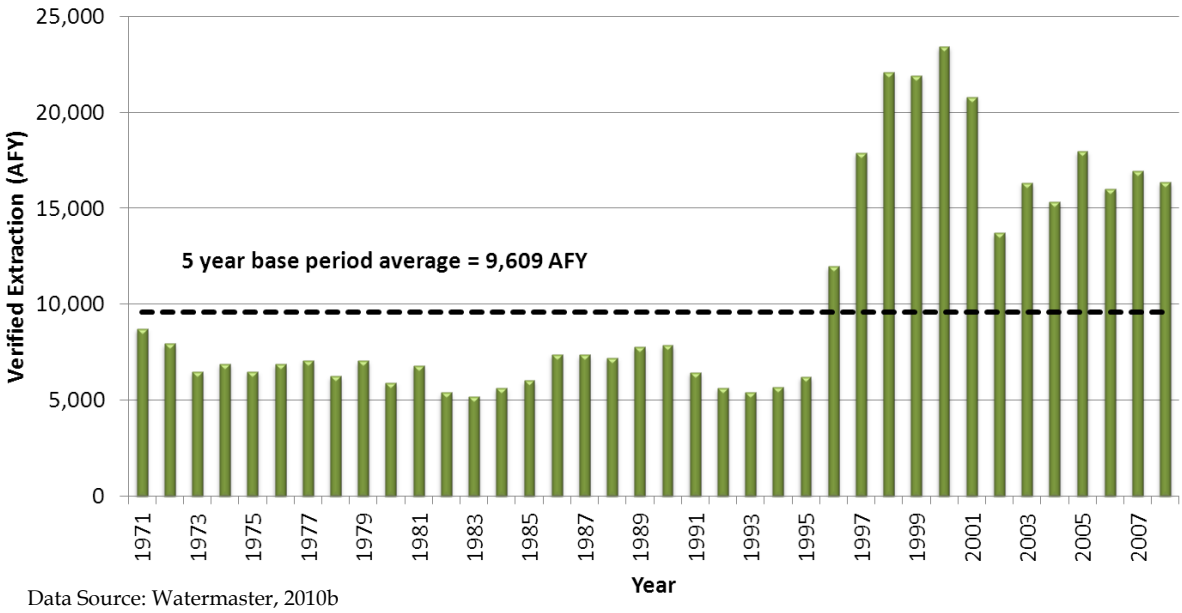
Entity	1959	1960	1961	1962	1963	Average
Empire	2,295	1,972	2,148	2,989	2,692	**2,419**
Jurupa	811	762	1,114	745	333	**753**
RPU	12,897	10,261	12,147	9,865	9,344	**10,903**
Riverside Highland	2,484	2,489	3,110	2,537	2,652	**2,654**
West Valley	88	86	81	71	80	**81**
Other	3,941	3,811	4,152	2,735	1,955	**3,319**
Private	1,813	1,459	314	543	650	**956**
Total	**24,329**	**20,840**	**23,066**	**19,485**	**17,706**	**21,085**

Figure 4.5, Figure 4.6, and Figure 4.7 compare the verified extractions (groundwater production verified by the Watermaster and published in its annual report) from Riverside North to the Base Period Average or Base Rights, based on the *Annual Report of the Western-San Bernardino Watermaster for 2009* (Watermaster, 2010b).

In Riverside North, Watermaster first determines the net credit or obligation by comparing actual extractions in the basin to Base Rights. If the actual extraction is less than the Base Rights, the difference is recorded as an extraction credit and is added to any accumulated credits from prior years commencing in 1971. If the actual extraction is greater than the Base Rights, the difference is recorded as excess extraction and is subtracted from any accumulated credits from prior years commencing in 1971. If such determinations result in a net accumulated obligation in Riverside North, then Watermaster utilizes any net accumulated credits available in either Riverside South or Colton Basin to offset the net accumulated obligation in Riverside North. If the net accumulated credits in Riverside South and Colton basins are not sufficient to offset obligations in Riverside North, Watermaster notifies the Court that Western is obligated to replenish the basin in the vicinity of the excess extraction or, if such replenishment is imported water, at the confluence of the Santa Ana River and Warm Creek. However, the replenishment obligations reported to the Court by Watermaster do not apply at any time that the base flow at Riverside Narrows and the amounts of water stored in the ground below Bunker Hill Dike are found by the Court to be sufficient to satisfy any obligation that Valley District may have under the 1969 Western Judgment. In the event the Court does not find that Valley District's obligations are being met, then Western must replenish the basin as described above using water at least equal in quality to the excess extraction water, and if imported water is released at Warm Creek then credit for such release shall be calculated using the quality adjustment formulas provided in the Orange County Judgment for adjusting Base Flow at Riverside Narrows. If the Court finds the obligations are being met, no recharge is required.

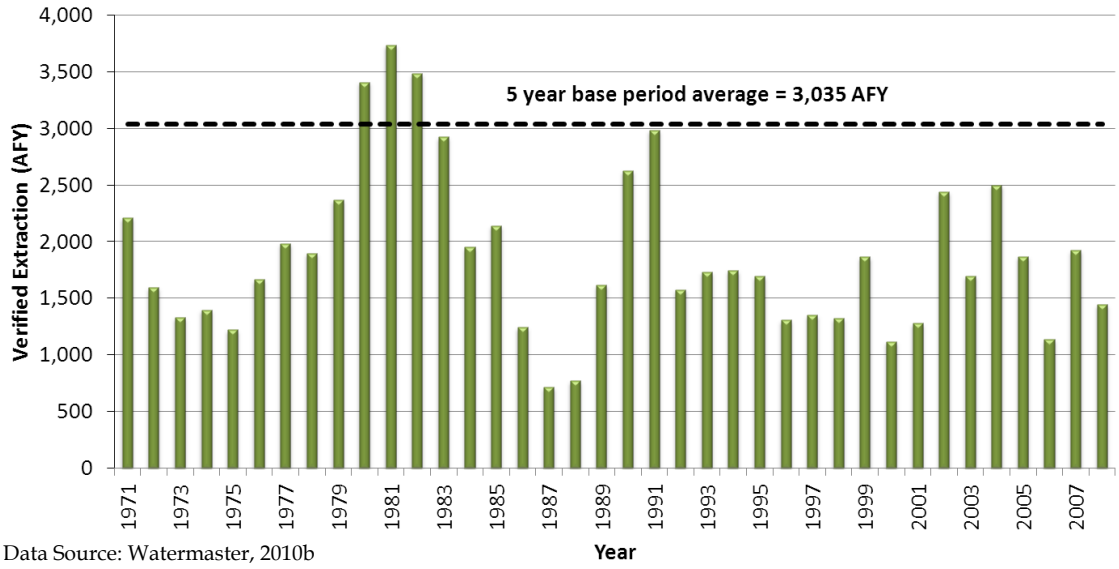
Watermaster also reports to the Court any annual extraction greater than 1.2 times the Base Rights in any year and identifies whether there are sufficient net accumulated credits in any basin to offset such excess extraction. If there are insufficient credits, the process for determining the need for recharge would follow the same path described above commencing with a determination of whether there are sufficient credits of any kind in any basin to offset the excess extraction.

To date, extractions from Riverside North by users within Western for use within Riverside County have not exceeded Base Rights. As of the Watermaster Annual Report for 2010, Western has credits of 457,380 AF for all basins, up from 452,111 in the previous year.



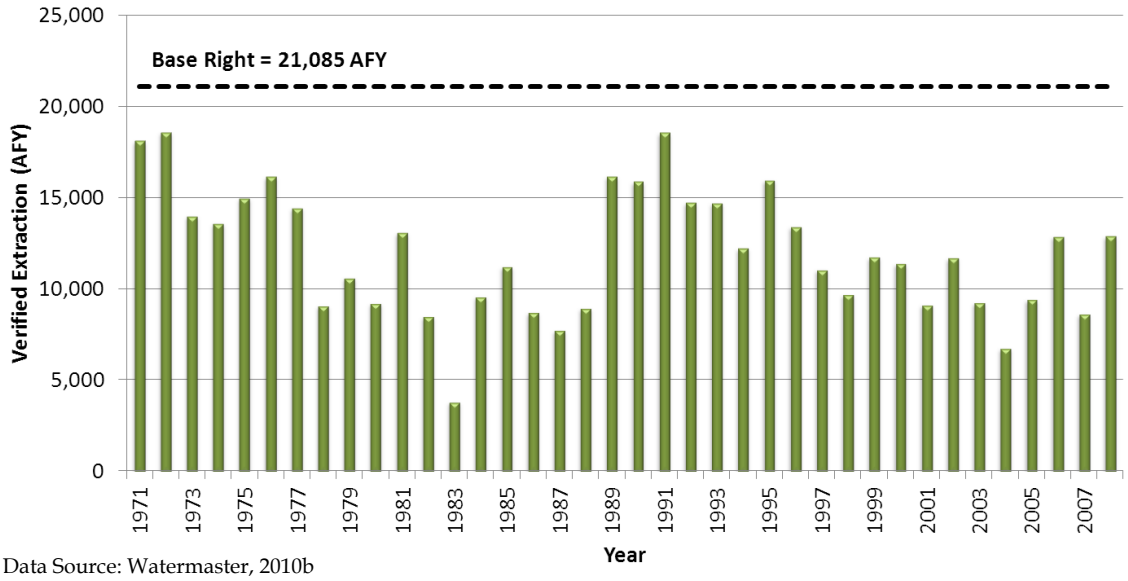
Data Source: Watermaster, 2010b

Figure 4.5
Verified Extraction from Riverside North by San Bernardino County Entities



Data Source: Watermaster, 2010b

Figure 4.6
Verified Extraction from Riverside North by Riverside County Entities for Use in San Bernardino County

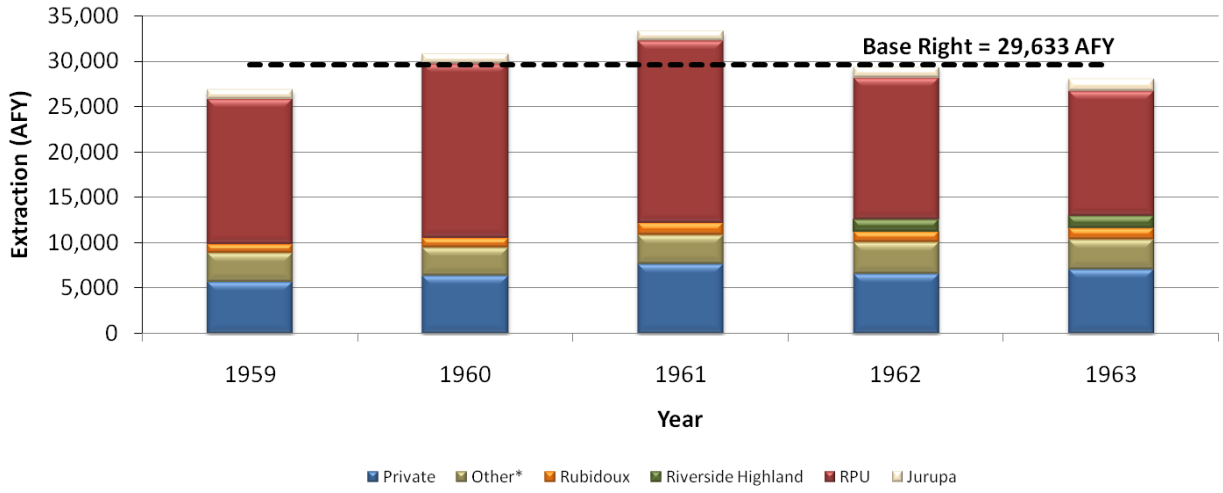


Data Source: Watermaster, 2010b

Figure 4.7
Verified Extraction from Riverside North by Riverside County Entities for Use in Riverside County

4.1.2 RIVERSIDE SOUTH

The 1969 Western Judgment set a 5-year Base Period Average and Base Rights for Riverside South of 29,633 AF for use in Riverside County (Figure 4.8 and Table 4-3).



Data Source: Watermaster, 2010b
* Agencies listed as "other" have an average of less than 350 AFY between 1990 and 2007

Figure 4.8
Base Period Extraction from Riverside South, by Entity

Table 4.3
Base Period Extractions from Riverside South, by Entity (AF)

Entity	1959	1960	1961	1962	1963	Average
Jurupa	1,003	1,068	1,056	1,146	1,414	**1,137**
RPU	15,973	19,164	19,977	15,569	13,714	**16,879**
Riverside Highland	0	0	0	1,393	1,381	**555**
Rubidoux	1,006	1,112	1,389	1,179	1,219	**1,181**
Other	3,212	3,118	3,171	3,438	3,289	**3,246**
Private	5,632	6,308	7,625	6,573	7,040	**6,636**
Total	**26,826**	**30,770**	**33,218**	**29,298**	**28,057**	**29,634**

Figure 4.9 compares the verified extractions from Riverside South to the Base Rights, based on the *Annual Report of the Western-San Bernardino Watermaster for 2009* (Watermaster, 2010b).

In Riverside South, Watermaster first determines the amounts of credits or obligations associated with each of several components of inflow or outflow from the area tributary to Riverside Narrows as required by the 1969 Western Judgment. The components are as follows:

Credits:

a) Under Extractions
b) Return from imported water
c) Return from additional local water

Obligations:

a) Excess extractions
b) New export
c) Land use conversion

The sum of all the credits is added to any accumulated credits from prior years commencing in 1971. Similarly, the sum of all obligations is added to any accumulated obligations. If the accumulated credits are greater than the accumulated obligations, then the sum of the accumulated credits is added to the accumulated credits from all basins which become available for use in offsetting any Western obligation. If the accumulated obligations are greater than the accumulated credits, then Watermaster utilizes any net accumulated credits, available in either Riverside North or Colton Basin to offset the net accumulated obligation in Riverside South. If the net accumulated credits in Riverside North and Colton basins are not sufficient to offset obligations in the Riverside South Basin, Watermaster notifies the Court that Western is obligated to replenish the basin in the vicinity of the excess extraction or, if such replenishment is imported water, at the confluence of the Santa Ana River and Warm Creek. However, the

replenishment obligations reported to the Court by Watermaster do not apply at any time that the base flow at Riverside Narrows and the amounts of water stored in the ground below Bunker Hill Dike are found by the Court to be sufficient to satisfy any obligation that Valley District may have under the 1969 Western Judgment. In the event the Court does not find that Valley District's obligations are being met, then Western must replenish the basin as described above using water at least equal in quality to the excess extraction water and if imported water is released at Warm Creek, then credit for such release shall be calculated using the quality adjustment formulas provided in the Orange County Judgment for adjusting Base Flow at Riverside Narrows. If the Court finds the objectives are being met, no recharge is required.

Watermaster also reports to the Court any excess extractions greater than 1.2 times the Base Rights in any year and identifies whether there are sufficient net accumulated credits in any basin to offset such excess extraction. If there are insufficient credits, the process for determining the need for recharge would follow the same path described above.

The sum of obligations in Riverside South in 5-year periods commencing in the period 1971-75 have exceeded Base Rights established in the 1959-63 Base Period 15 times. The first four times the right was exceeded, the obligation was offset using credits from Riverside North and Colton basins. The last 11 times, the obligation was offset by using prior-year accumulated credits from within Riverside South Basin. Watermaster has historically offset obligation by first using any prior-year accumulated credit in the same basin; and if none is available, Watermaster offsets using accumulated credits from other basins. Therefore, since extraction credits have been available in prior 5-year periods starting in 1971-75, either in Riverside South or Riverside North or Colton Basins, Watermaster notified the Court that Western was not required to provide replenishment water in any 5-year period including the 15 in which obligations exceeded credits.

Since 1971, Watermaster has reported to the Court on three occasions that an annual extraction exceeded 1.2 times the 5-year Base Period annual average (1972, 1974, and 2007). Each time Watermaster notified the Court that accumulated credits, either in Riverside South, or Riverside North or Colton basins, were sufficient to offset the obligation, and therefore there was no obligation for Western to recharge.

The 2010 Watermaster Report indicates that Western has credits of 457,380 AF for all three basins below Bunker Hill Dike, up from 452,111 in the previous year.

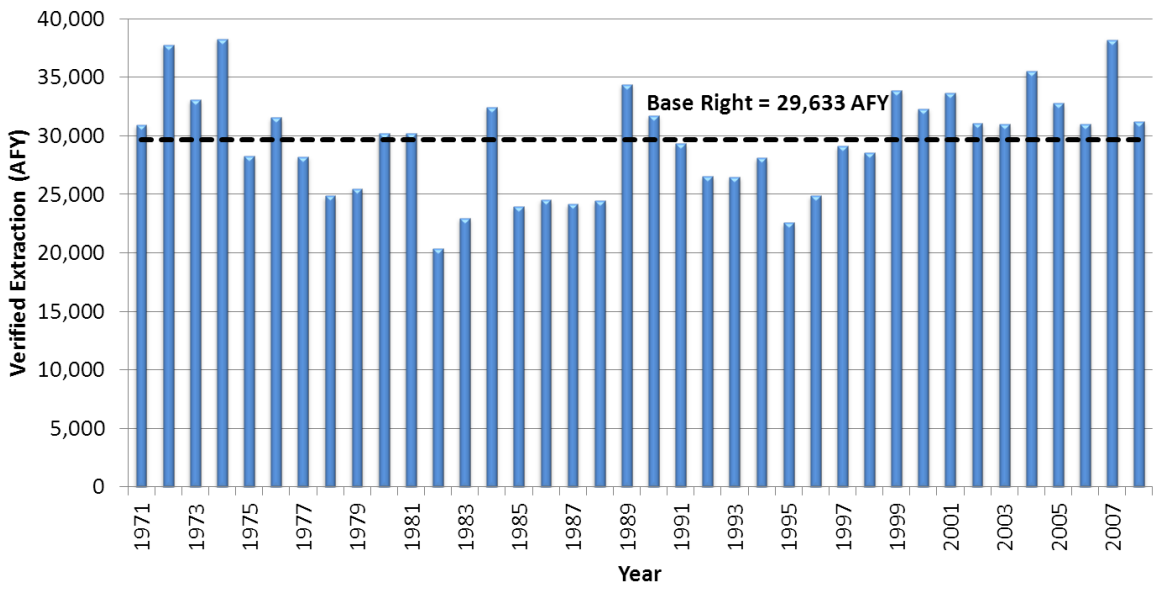


Figure 4.9
Verified Extraction from Riverside South by Riverside County Entities for Use in Riverside County

4.2 PROJECTED PRODUCTION

The 1969 Western Judgment requires recharge activities by Western if production exceeds Base Rights and no accumulated credits are available in any basin to offset the excess production, and if the Court does not find that Valley District is meeting its obligation at Riverside Narrows. Base Rights established for Riverside South are 29,633 AFY; Base Rights established for Riverside North for use in Riverside County are 21,085 AFY. If there are no accumulated credits in any basin between Bunker Hill Dike and Riverside Narrows and if the obligation to OCWD is not being met at Riverside Narrows, then Western is required to recharge the basin if production exceeds these values by 20 percent in a single year or if there is overproduction during a 5-year period.

4.2.1 RIVERSIDE NORTH

In Riverside North, the only limits to groundwater production based on volume extracted are for Riverside County entities exporting for use within Riverside County. The amount of the different entities' projected productions that would be used within Riverside County is based on historical data from the Watermaster and is as follows:

- RPU, 100 percent
- Riverside Highland, 11 percent
- West Valley, see below
- Other (includes Meeks & Daley), 100 percent
- Private, 0 percent

Table 4.4 shows the projected Riverside North groundwater production for use in Riverside County. Note that while West Valley is a San Bernardino County entity, this table continues the historical trend of 21 AFY of production of Riverside North groundwater for use in Riverside County.

Table 4.5 shows how these increases could impact the replenishment obligations of the 1969 Western Judgment. These tables utilize 2008 as current conditions as this was the latest available data from the Watermaster (2010b) at the time of writing; note that the text includes some updates to these values including the net accumulated credit of 457,380 AF. Figure 4.10 graphically shows the historical and projected trends in extraction compared to Base Rights. The projected groundwater production does not exceed Base Rights in Riverside North.

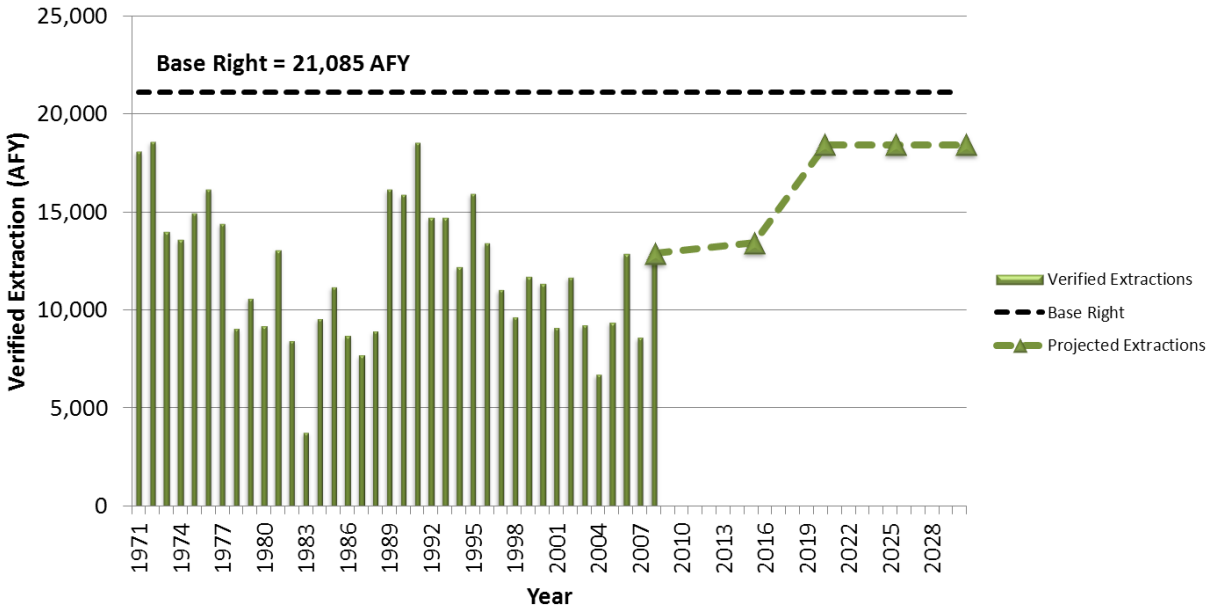
Western's existing net accumulated credits, 457,380 AF for all basins (Riverside North, Riverside South, and Colton), would be used prior to required replenishment, should groundwater production exceed Base Rights. Credits for Riverside North have been accumulating over the past 5 years at a rate between approximately 8,200 and 14,400 AFY, due to extraction below the Base Rights. Projected credits and replenishment requirements are included in Table 4.5. Should current credit of 457,380 AF be expended, Western will be responsible for recharging the basin unless the Court finds that Valley District's base flow obligation are being met at Riverside Narrows.

Table 4.4
Current and Projected Riverside North Groundwater Supplies for Use in Riverside County (AFY)

Groundwater Producer	2008	Projection			
		2015	2020	2025	2030
RPU	10,651	12,000	17,000	17,000	17,000
Riverside Highland	163	460	460	460	460
West Valley	21	20	20	20	20
Other	2,043	940	940	940	940
Total Riverside North Basin	**12,878**	**13,420**	**18,420**	**18,420**	**18,420**

Table 4.5
Projected Total Riverside North Groundwater Supplies (AFY)

	2008	Projection			
		2015	2020	2025	2030
Total Riverside North Basin	12,878	13,420	18,420	18,420	18,420
Base Rights	21,085	21,085	21,085	21,085	21,085
Excess Production Credit or (Obligation)	**8,207**	**7,665**	**2,665**	**2,665**	**2,665**
Cumulative Credits	**345,341**	**401,200**	**424,500**	**437,800**	**451,100**
Annual Replenishment Requirement	**0**	**0**	**0**	**0**	**0**



Data Sources: Agency UWMPs; Watermaster, 2010b

Figure 4.10
Historical and Projected Riverside North Extraction for Use within Riverside County

4.2.2 RIVERSIDE SOUTH

Table 4.6 shows the projected Riverside South groundwater production. Table 4.7 shows how these increases could impact the replenishment obligations of the 1969 Western Judgment. Figure 4.11 graphically shows the historical and projected trends in extraction compared to Base Rights. The projected groundwater production exceeds Base Rights in Riverside South.

Table 4.6
Current and Projected Riverside South Groundwater Supplies (AFY)

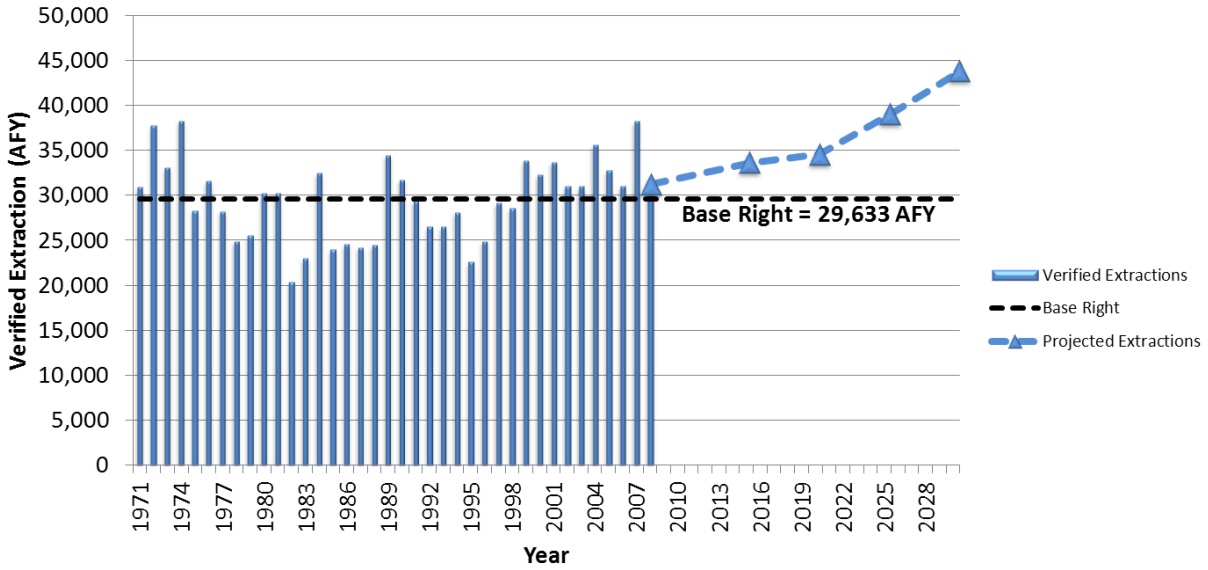
Groundwater Producer	2008	Projection			
		2015	2020	2025	2030
Jurupa	603	600	600	600	600
RPU	21,952	20,070	20,270	24,670	29,470
Riverside Highland	0	1,000	1,000	1,000	1,000
Rubidoux	6,702	9,820	10,520	10,600	10,600
Other	939	940	940	940	940
Private	620	830	830	830	830
Box Springs*	403	370	370	370	370
Total Riverside South Basin	**31,219**	**33,630**	**34,530**	**39,010**	**43,810**

*Box Springs Mutual Water Company production was not discussed previously as the production is outside the Plan Area. However, the production is within the boundaries of the 1969 Western Judgment and is included here as part of that discussion.

Table 4.7
Projected Total Riverside South Groundwater Supplies (AF)

		Projection			
	2008	2015	2020	2025	2030
Total Riverside South Basin	31,219	33,630	34,530	39,010	43,810
Base Rights	29,633	29,633	29,633	29,633	29,633
Excess Production Credit or (Obligation)	**-1,554**	**-3,997**	**-4,897**	**-9,377**	**-14,177**
Cumulative Credits	**23,776**	**10,500**	**-12,000**	**-55,500**	**-123,000**
Annual Replenishment Requirement	**0***	**0***	**0***	**0***	**0***

*Annual Replenishment Requirement is zero because Accumulated Credits in Riverside North and Colton are sufficient to offset the obligations in Riverside South.



Data Sources: Agency UWMPs; Watermaster, 2010b

Figure 4.11
Historical and Projected Riverside South Extraction

Western's existing net accumulated credits, 457,380 AF for all basins (Riverside North, Riverside South and Colton) and 23,776 for Riverside South, will be used prior to required replenishment. Credits for Riverside South have been accumulating over the past 5 years at a rate between approximately 1,300 and 3,000 AFY, due to return from imported water deliveries. The amount of credits accumulated yearly has been declining slightly due to land use conversions. Projected credits and replenishment requirements are included in Table 4.7 and include the following assumptions:

- Imported water credits for Riverside South are assumed to remain constant at 1,300 AFY, approximately at 2008 levels. These credits accrue due to delivery of water by Western to the North Service Area, as RPU does not project to use imported water.
- Obligations for land use conversions for Riverside South continue at 579 AFY through 2030.

If credit in the Colton Basin continues to increase at historic rates, the credit in that basin will be approximately 132,000 AF by 2030. Table 4.5 indicates that Riverside North will have about 451,000 credits by 2030. Table 4.7 indicates that Riverside South will have a cumulative obligation of about 123,000 AF by 2030. In summary, the cumulative credit available for use in offsetting excess extractions in any basin will be 460,000 AF by 2030 (132,000 + 451,000 - 123,000 = 460,000). Such cumulative credit is approximately equal to the current credit. Therefore, during the next 22 years, the sum of the extractions for use in the three basins below Bunker Hill Dike for use within Western are about equal to the Base Period or allowable extractions.

If, in any year after 2030, the remaining 460,000 AF of credit were fully utilized and if Valley District is meeting its obligation at Riverside Narrows, Western could petition the Court for an order eliminating the need for any replenishment.

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5 OPERATIONAL YIELD

5.1 BACKGROUND

RPU and Western are committed to protecting the groundwater resources of the Riverside Basin. The agencies are considering the use of an adaptive management strategy (Operational Yield) to manage the planned extractions and recharge activities within the basin. The management strategy would be implemented through the Advisory Committee described in Section 1.8. This approach supplements the 1969 Western Judgment and can work within its framework.

Operational Yield is defined as the amount of groundwater that can be safely pumped from the groundwater basin over a short period (one year) that allows acceptable levels of impact on the aquifer. Operational Yield is a dynamic value that changes from year-to-year based on projected hydrologic conditions, current groundwater levels, goals/objectives established by the Advisory Committee, and planned recharge activities.

Implementing a short-term Operational Yield approach, rather than a long-range average methodology (such as safe yield), will provide the Advisory Committee with an enhanced tool to manage the basin through varying hydrologic conditions as well as planned extractions and recharge activities. This refined basin management approach will work towards:

- Maintaining a sustainable, high quality water supply for agricultural, environmental, and municipal uses;
- Preventing long-term declines in groundwater levels;
- Maintaining groundwater levels to assure an adequate and affordable water supply while protecting against recharge obligations triggered by groundwater levels in the 1969 Western Judgment index wells;
- Establishing mutually acceptable quantitative limitations on groundwater extractions to limit adverse impacts while protecting against recharge obligations triggered by over extraction;
- Protecting groundwater quality; and
- Facilitating groundwater replenishment and cooperative management projects.

5.2 DEVELOPMENT

Initially, the Advisory Committee should establish a baseline target for groundwater levels within the Riverside Basin. The baseline target could be set to maximize groundwater levels within the basin, to minimize outflow from the Riverside Basin, or to achieve other criteria. The Advisory Committee will then compare the current conditions in the Riverside Basin to the baseline target to determine the state of the basin.

The Advisory Committee should develop a standard method to calculate the Operational Yield. One example methodology is as follows:

$$Operational\ Yield\ = \\ Estimated\ Inflow - Estimated\ Nonextraction\ Outflow + \\ Estimated\ Artifical\ Recharge\ \pm Water\ Level\ Adjustment$$

Estimated Inflow:	Inflow to the Riverside Basin including deep percolation of precipitation and applied water, streambed percolation, subsurface inflow, and percolation associated with RIX operation. This term excludes artificial recharge.
Estimated Non-Extraction Outflow:	Outflow from the Riverside Basin including subsurface outflow. This term excludes agricultural, municipal, and RIX extractions.
Estimated Artificial Recharge:	Planned artificial recharge to the Riverside Basin including recharge associated with projects such as the Riverside North Aquifer Storage and Recovery (ASR) Project, the Pellissier Ranch Groundwater Augmentation Project, and increased storm water recharge associated with the Riverside Agreement. The Riverside Agreement was developed by RPU, Valley District, and Western to account for the loss of in-stream recharge within the Bunker Hill, Rialto Colton, and Riverside basins due to the construction of the Seven Oaks Dam and associated diversions and recharge activities.
Water Level Adjustment:	The estimated quantity of water that may be needed to correct an imbalance between the current groundwater levels in the Riverside Basin and the baseline target. This term can be positive or negative depending on the state of the basin.

The Operational Yield quantities would be developed on an annual basis (or as determined by the Advisory Committee) for the following three years. In calculating the Operational Yield, a precautionary approach should be taken with estimates being lower where there is limited or less certain information (e.g., Year 2 or Year 3 projections for inflow, outflow, and artificial recharge).

Table 5.1 and Figure 5.1 were developed using the methodology described above and results from *Riverside-Arlington Groundwater Flow Model (RAGFM) Model Development and Scenarios* (WRIME, 2011), which evaluated 43-years of hydrology. Figure 5.1 shows the total annual precipitation data for a weather station located in San Bernardino (an area that generates significant flow to the Santa Ana River), total inflow to the Riverside Basin, and the total

Operation Yield[1]. Figure 5.1 illustrates the correlation between these parameters and identifies the wet, dry, and average hydrologic conditions for the period of 1965 to 2007. As basin operations change in the Bunker Hill and Rialto-Colton basins with projects such as Seven Oaks Dam and the Active Recharge project, the relationship between these parameters will also change.

Figure 5.2 is an exceedence plot that shows the total Operational Yield and Operational Yield without RIX extractions for the data presented in Table 5.1. Operational Yield without RIX extractions, or available Operational Yield, equals total Operational Yield minus extractions associated with the operations of RIX. The historical available Operational Yield is an estimate of the amount of groundwater that would have been available for extraction by agricultural and municipal producers from the Riverside Basin without implementation of basin management strategies (e.g., artificial recharge and water level adjustment). Figure 5.2 illustrates the likelihood and quantity of Operational Yield; and how large the Operational Yield can be in extreme wet years. Figure 5-2 also shows:

- The potential range for total Operational Yield (aggregate extractions including RIX operations) from the Riverside Basin could be as low as 70,500 AFY and as high as 161,000 AFY without implementation of basin management strategies. The average total Operational Yield is 98,100 AFY.
- The potential range for available Operational Yield from the Riverside Basin could be as low as 34,700 AFY and as high as 125,100 AFY without implementation of basin management strategies. The average available Operational Yield is 62,300 AFY. Note that the average available Operational Yield is only available about 3 out of every 10 years.

During the Base Period, the 5-year average extraction from the Riverside Basin was 63,362 AFY, which consisted of the following:

- 9,609 AFY for San Bernardino County entities for use in San Bernardino County (the 1969 Western Judgment does not limit production by San Bernardino entities)
- 3,035 AFY for Riverside County entities for use in San Bernardino County
- 21,085 AFY for export to Riverside County
- 29,633 AFY for use in Riverside County

During the Base Period, there were no artificial recharge activities, water level adjustments, nor RIX extractions.

[1] Total operation yield includes extractions associated with RIX operations. Throughout the historical period, the amount of artificial recharge was zero and the water level adjustment term was zero. Thus, the historical total operation yield from the Riverside Basin is equal to the estimated inflow minus the estimated non-production outflow.

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Table 5.1 Annual Groundwater Budget for Riverside Basin and Associated Operational Yield[1]

Simulation Year	Hydrologic Year	Total Annual Precipitation[2]	Total Inflow	Total Outflow	Total Storage Change	Total Extraction[3]	Storage Change due to Extraction	Non-Extraction Outflow[4]	Total Operational Yield[5]	Available Operational Yield[6]
					=Total Inflow-Total Outflow		=Total Inflow-Total Extraction	=Total Outflow-Total Extraction	=Total Inflow-Non-Extraction	=Total Operational Yield – RIX Extraction
		inches	AFY	AFY	AFY	AFY	AFY	AFY	AFY	AFY
1	1965	22	100,494	124,781	-24,287	100,530	-36	24,251	76,243	40,441
2	1966	15	102,855	123,170	-20,315	100,530	2,325	22,640	80,215	44,413
3	1967	18	91,543	121,592	-30,049	100,530	-8,987	21,062	70,481	34,679
4	1968	8	91,745	119,931	-28,186	100,730	-8,985	19,201	72,544	36,642
5	1969	32	184,190	130,902	53,288	100,530	83,660	30,372	153,818	118,016
6	1970	15	94,978	121,080	-26,102	100,530	-5,552	20,550	74,428	38,626
7	1971	13	95,143	119,727	-24,584	100,530	-5,387	19,197	75,946	40,144
8	1972	7	93,698	118,862	-25,164	100,730	-7,032	18,132	75,566	39,664
9	1973	15	104,895	118,633	-13,738	100,530	4,365	18,103	86,792	50,990
10	1974	15	101,442	117,821	-16,379	100,530	912	17,291	84,151	48,349
11	1975	12	99,882	117,156	-17,274	100,530	-648	16,626	83,256	47,454
12	1976	15	104,922	117,189	-12,267	100,616	4,306	16,573	88,349	52,447
13	1977	15	104,882	116,515	-11,633	100,326	4,556	16,189	88,693	52,891
14	1978	30	173,243	122,576	50,667	100,326	72,917	22,250	150,993	115,191
15	1979	15	121,955	119,051	2,904	100,326	21,629	18,725	103,230	67,428
16	1980	27	188,178	127,701	60,477	100,526	87,652	27,175	161,003	125,101
17	1981	12	106,904	119,411	-12,507	100,326	6,578	19,085	87,819	52,017
18	1982	23	126,542	120,826	5,716	100,326	26,216	20,500	106,042	70,240
19	1983	34	185,727	128,445	57,282	100,326	85,401	28,119	157,608	121,806
20	1984	9	120,042	123,871	-3,829	100,526	19,516	23,345	96,697	60,795
21	1985	11	117,938	123,599	-5,661	100,326	17,612	23,273	94,665	58,863
22	1986	16	126,114	124,294	1,820	100,326	25,788	23,968	102,146	66,344
23	1987	12	114,531	122,653	-8,122	100,326	14,205	22,327	92,204	56,402
24	1988	13	113,157	122,256	-9,099	100,526	12,631	21,730	91,427	55,525
25	1989	7	109,879	121,295	-11,416	100,326	9,553	20,969	88,910	53,108
26	1990	8	108,462	120,578	-12,116	100,326	8,136	20,252	88,210	5
27	1991	18	120,362	121,276	-914	100,326	20,036	20,950	99,412	63,610
28	1992	20	121,295	121,793	-498	100,526	20,769	21,267	100,028	64,126

Simulation Year	Hydrologic Year	Total Annual Precipitation[2]	Total Inflow	Total Outflow	Total Storage Change	Total Extraction[3]	Storage Change due to Extraction	Non-Extraction Outflow[4]	Total Operational Yield[5]	Available Operational Yield[6]
					=Total Inflow-Total Outflow		=Total Inflow-Total Extraction	=Total Outflow-Total Extraction	=Total Inflow-Non-Extraction	=Total Operational Yield – RIX Extraction
		inches	AFY	AFY	AFY	AFY	AFY	AFY	AFY	AFY
29	1993	26	165,473	127,701	37,772	100,326	65,147	27,375	138,098	102,296
30	1994	13	105,765	121,761	-15,996	100,326	5,439	21,435	84,330	48,528
31	1995	22	145,649	126,256	19,393	100,326	45,323	25,930	119,719	83,917
32	1996	19	111,136	122,944	-11,808	100,526	10,610	22,418	88,718	52,816
33	1997	17	109,427	121,859	-12,432	100,326	9,101	21,533	87,894	52,092
34	1998	29	150,062	125,997	24,065	100,326	49,736	25,671	124,391	88,589
35	1999	7	106,392	121,885	-15,493	100,326	6,066	21,559	84,833	49,031
36	2000	12	107,362	121,462	-14,100	100,526	6,836	20,936	86,426	50,524
37	2001	17	106,957	120,344	-13,387	100,326	6,631	20,018	86,939	51,137
38	2002	9	103,023	119,161	-16,138	100,326	2,697	18,835	84,188	48,386
39	2003	14	110,812	119,746	-8,934	100,326	10,486	19,420	91,392	55,590
40	2004	18	114,979	119,768	-4,789	100,526	14,453	19,242	95,737	59,835
41	2005	22	166,404	126,507	39,897	100,326	66,078	26,181	140,223	104,421
42	2006	12	111,350	121,287	-9,937	100,326	11,024	20,961	90,389	54,587
43	2007	9	102,479	119,514	-17,035	100,326	2,153	19,188	83,291	47,489
Minimum		7	91,543	116,515	-30,049	100,326	-8,987	16,189	70,481	34,679
Maximum		34	188,178	130,902	60,477	100,730	87,652	30,372	161,003	125,101
Average		16	119,588	121,934	-2,347	100,427	19,161	21,508	98,080	62,255

1. Data extracted from Tables 18 and 19 of the *Riverside-Arlington Groundwater Flow Model (RAFGM): Model Development and Scenarios* report prepared by WRIME in June 2011.
2. Total annual precipitation data was compiled by OCWD primarily from the San Bernardino County Hospital rain gauge (Site 2146) with supplemental gauges 2146-A, 2001B2, 2001B3, 2015, 2357 and the Gilbert St. gauge.
3. Total extractions are included in the total outflow and include the mandatory RIX extractions.
4. Non-extraction includes subsurface outflows from the Riverside Basin as well as other non-extraction losses.
5. Total Operational Yield is the total amount of groundwater that could have been extracted without impacting the Riverside Basin including RIX extractions.
6. Available Operational Yield is the amount of groundwater that could have been extracted for agricultural and municipal uses without impacting the Riverside Basin.

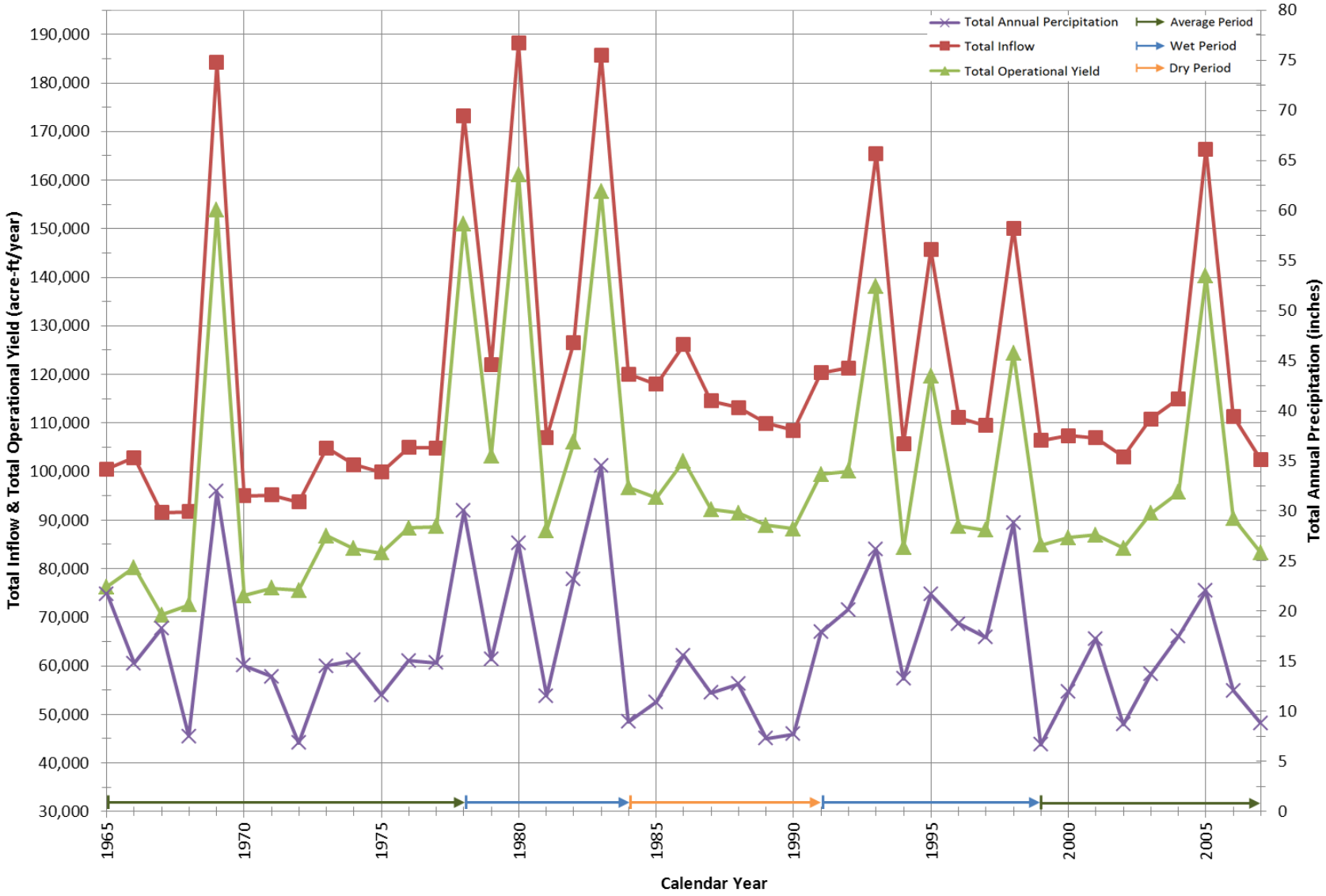
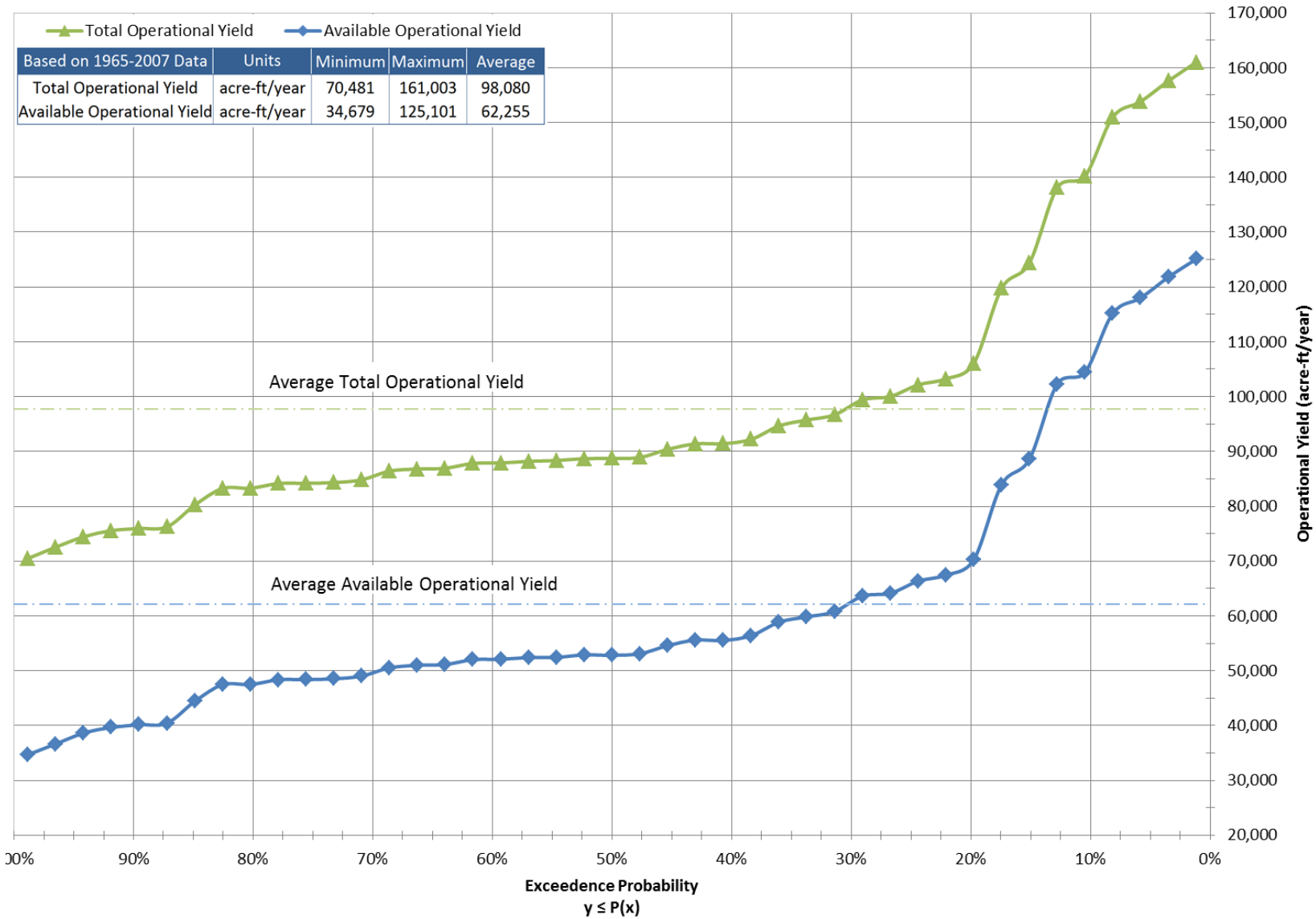


Figure 5.1
Simulated Historical Basin Trends



Based on 1965-2007 Data	Units	Minimum	Maximum	Average
Total Operational Yield	acre-ft/year	70,481	161,003	98,080
Available Operational Yield	acre-ft/year	34,679	125,101	62,255

Figure 5.2
Estimated Operational Yield

5.3 IMPLEMENTATION

Table 5.2 shows nine basic conditions of the Riverside Basin and the corresponding potential operational responses. The conditions range from low groundwater levels (as compared to the baseline target) coupled with less than average precipitation projections (e.g., La Niña) for the following year(s) to high groundwater levels coupled with above average precipitation projections (e.g., El Niño) for the following year(s).

Table 5.2
Riverside Basin Conditions and Potential Operational Responses

Basin Condition	Projected Weather Forecast	Actual Groundwater Levels	Potential Operational Responses
1	Dry	Low	Substantially curtail production; increase artificial recharge (likely imported water).
2	Average	Low	Curtail production proportionally to water levels or proceed with average production with increased artificial recharge (likely imported water).
3	Wet	Low	Average production with increased artificial recharge.
4	Dry	Normal	Curtail production proportionally to weather forecast or proceed with average production with increased artificial recharge (likely imported water).
5	Average	Normal	Average production.
6	Wet	Normal	Increase production proportionally to weather forecast.
7	Dry	High	Average production.
8	Average	High	Increase production proportionally to water levels.
9	Wet	High	Substantially increase production; curtail artificial recharge.

The Advisory Committee will need to select which basin condition best represents the future status of the Riverside Basin in each of the three succeeding years to determine the Operational Yields. Figure 5.3 is an exceedence plot that shows the total inflow to the Riverside Basin, total Operational Yield, and the available Operational Yield from data shown in Table 5.1.

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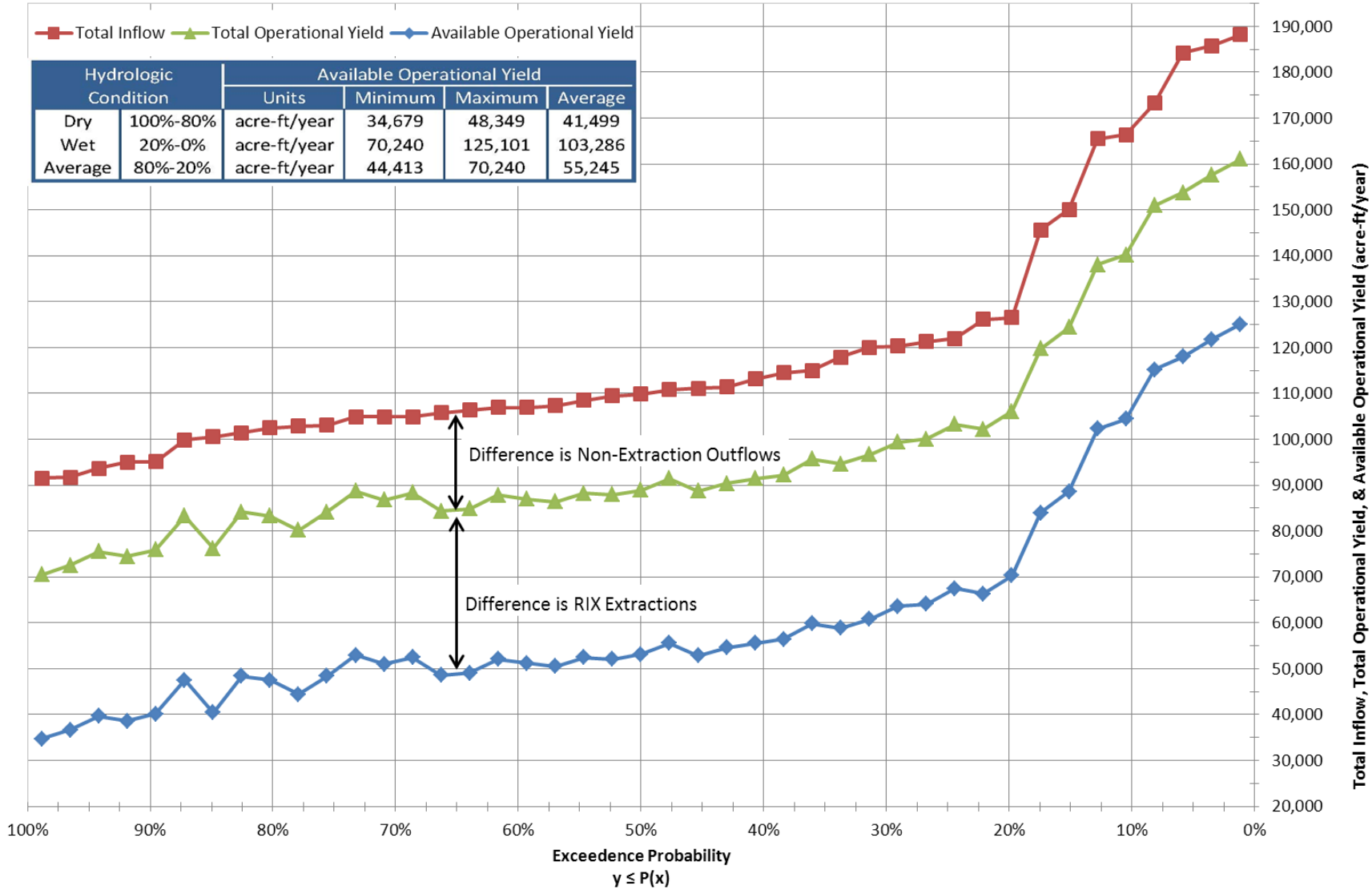

Hydrologic Condition		Available Operational Yield			
		Units	Minimum	Maximum	Average
Dry	100%-80%	acre-ft/year	34,679	48,349	41,499
Wet	20%-0%	acre-ft/year	70,240	125,101	103,286
Average	80%-20%	acre-ft/year	44,413	70,240	55,245

Figure 5.3
Operational Yield Estimation Based on the Total Inflow

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Figure 5.3 shows the following:

- In 2 out of 10 years, during periods with less-than-average precipitation (dry hydrologic conditions), the available Operational Yield ranged from 34,700 AFY to 48,300 AFY with the average being 41,500 AFY.
- In 2 out of 10 years, during periods with above average precipitation (wet hydrologic conditions), the available Operational Yield ranged from 70,200 AFY to 125,100 AFY with the average being 103,300 AFY.
- In 6 out of 10 years, during average hydrologic conditions, the available Operational Yield ranged from 44,400 AFY to 70,200 AFY with the average being 55,200 AFY.

One approach that could be used to estimate future Operational Yield quantities is to correlate the anticipated future basin condition with a similar past condition to determine the historical Operational Yield. Initially, the projected weather forecasts would be used to identify if future precipitation conditions are likely to be above or below average historical conditions; and to what magnitude above or below those average historical conditions. The projected weather forecasts will determine which hydrologic condition (dry, wet, or average) best represents the future condition. Next, the current groundwater levels (as compared to the baseline target) will determine which Operational Yield value is chosen from the range given for the selected future hydrologic condition. Lastly, the estimated historical Operational Yield can then be adjusted based on the planned artificial recharge activities to determine the projected Operational Yield for each of the three succeeding years. For example, if the weather forecast for the following year is projected to be an average hydrologic year and the current groundwater levels are 20 feet below the baseline target, then the corresponding historical available Operational Yield quantity would be about 45,000 AFY. By selecting a historical operation yield value on the lower end of the range for average hydrologic conditions, groundwater levels within the basin should rise. Over time, the Advisory Committee will better understand how the Riverside Basin responds to its management strategies. The final step in developing the available Operational Yield quantities for the following year is to adjust the historical available Operational Yield by the amount of planned artificial recharge. Therefore, if 10,000 AF of artificial recharge is planned, then the available Operational Yield target for that year would be 55,000 AF (45,000 AF plus 10,000 AF). At this level of production and with the anticipated basin conditions, groundwater levels would theoretically rise over the following year.

Another approach that could provide a more detailed estimate for future Operational Yield values is to model the future surface water and groundwater conditions within the Riverside Basin and develop scenarios with planned basin management strategies to determine the estimated inflows to the basin and the corresponding Operational Yields.

Irrespective of which approach is used to estimate Operational Yield, the quantity of Operational Yield will vary from year to year due to the hydrology in the Santa Ana River

Watershed, previous extractions, goals/objectives established by the Advisory Committee, and planned artificial recharge activities; consequently, large producers (retail water entities) will be requested to vary their extractions from the Riverside Basin.

During dry years, drought conditions, and/or low groundwater levels, water retailers may be advised to curtail pumping, redistribute pumping to areas within the basin that can support the proposed extractions, increase artificial recharge, or participate in a cooperative recharge program to ease adverse impacts. Conversely, during wet years and/or high groundwater levels, water retailers may be notified to increase pumping if the water can be put to beneficial use. Water retailers will be asked to curtail or increase pumping based on the quantity of available Operational Yield for the ensuing year, their percentage of extraction as compared to the aggregate extraction from the basin (excluding RIX), the location of their wells, and/or the amount of artificial recharge they plan to contribute to the basin.

Available Operational Yield is an aggregate extraction target that will be established and utilized by the Advisory Committee as part of its adaptive management strategy for the Riverside Basin. This management strategy is meant to manage the Riverside Basin in accordance with the 1969 Western Judgment and is in no way meant to replace or displace the provisions of the 1969 Western Judgment or the responsibilities of the Watermaster. In addition, the Operational Yield quantity established for the Riverside Basin is a short-term management strategy and is not equivalent to the Riverside Basin's safe yield. The safe yield has not been determined and may only be determined and used to regulate the basin pursuant to Paragraph VIII (g) of the 1969 Western Judgment in the event the current regulation is found by the Court to be unworkable.

Application of the calculated Operational Yield as a limit on extractions should be applied through a collaborative effort by the Advisory Committee. Implementation of the management measures described in this GWMP are intended as a proactive management approach to protect the yield, water quality, and cost of extraction of groundwater from the Riverside Basin. Failure to adhere to the recommendations specified by the Advisory Committee is not an enforceable offence but may have unfavorable impacts to the basin.

6 GOAL AND OBJECTIVES FOR THE BASIN

6.1 RIVERSIDE BASIN GOAL

The goal of the Riverside Basin GWMP is to operate the groundwater basin in a sustainable manner for reliable supply for beneficial uses.

Sustainable is defined as being able to continue groundwater production in the future with a similar real cost, quantity, and end-user quality as today. Beneficial uses include water supplies for municipal use, agricultural use, private wells, environmental purposes, and downstream users.

Four basin management objectives (BMOs) to support this goal are defined in this section. In turn, elements of the GWMP are presented in Section 7, and implementation is presented in Section 8. Together, and with the implementation of Operational Yield discussed in Section 5, these function as the overall groundwater management strategy for the Riverside Basin.

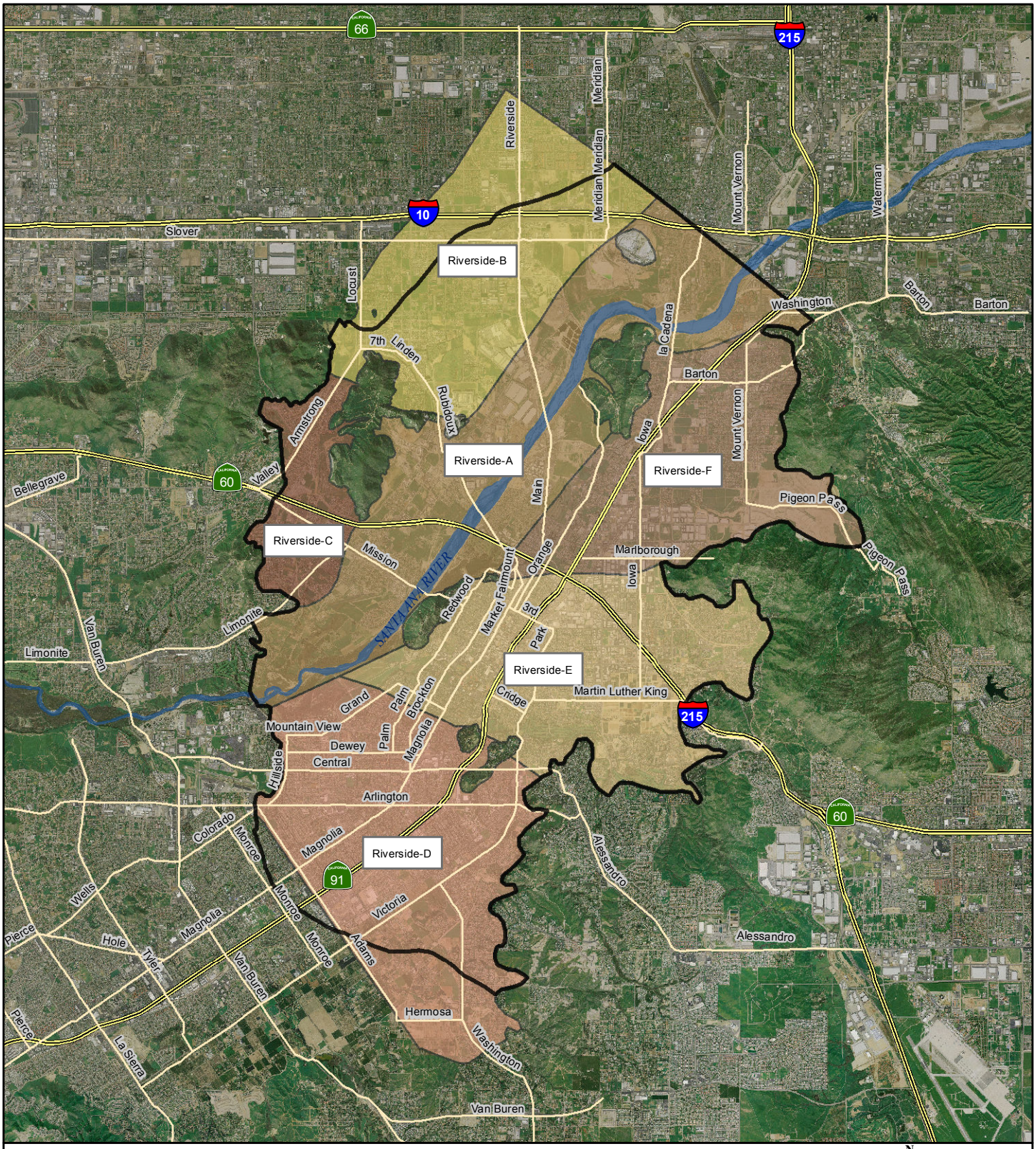
6.2 COMPONENTS OF BASIN MANAGEMENT OBJECTIVES

Basin management objectives, or BMOs, are adaptable, quantifiable objectives with prescribed monitoring and defined reporting and responses. BMOs are defined through the following:

- Management areas and sub-areas
- Public input
- Monitoring
- Adaptive management
- Enforcement mechanisms

6.2.1 MANAGEMENT AREAS AND SUB-AREAS

The management area is the entire Plan Area and is divided into sub-areas (see Figure 6.1) equivalent to the water quality management zones defined in the RWQCB's Basin Plan (see Section 1.6.3). The water quality management zones are based on hydrogeological conditions, making them suitable for use in BMOs relating to groundwater quality. The groundwater level BMO is based on Riverside North and Riverside South to maintain consistency with the 1969 Western Judgment. Subsidence and groundwater/surface water interaction BMOs relate to the Plan Area as a whole.



Legend

Plan Area

Highways

Roads

* Management Zones Source: Wildermuth, 2000

N
W E
S

0 0.5 1 2 Miles

CITY OF RIVERSIDE

Sub Areas

Riverside Basin Groundwater Management Plan

2011

Figure 6.1

6.2.2 PUBLIC INPUT

Public input is important in establishing BMOs. Local knowledge is needed to develop appropriate objectives and local acceptance is necessary for implementation. Public input for the BMOs was gathered through Advisory Committee meetings and public meetings, as described in Sections 1.7 and 1.8.

6.2.3 MONITORING

The BMOs are quantitative with defined accurate, consistent, and accepted monitoring procedures. This monitoring will document if objectives are being met and will trigger actions if defined thresholds are exceeded. The monitoring protocol must allow for quick and easy data sharing among all stakeholders to gain acceptability and to allow for action, if needed, in a timely fashion. Monitoring is described under each BMO and in Appendix D.

6.2.4 ADAPTIVE MANAGEMENT

Every year brings new data and new conditions to the Riverside Basin. The BMOs are intended to be flexible, allowing for adjustments due to changes in basin operations and to increased understanding of groundwater basin characteristics. Adjustments to BMOs are discussed in Section 7.4.5, Reporting and Updating.

6.2.5 ENFORCEMENT MECHANISMS

In its current form, the GWMP does not have enforcement mechanisms for the BMOs. The BMOs are guidelines to be monitored and reported for the benefit of all Riverside Basin users. As the BMOs are defined to meet a common goal, it is intended that enforcement will not be necessary. However, future plan revisions may implement enforcement mechanisms if deemed necessary by the stakeholders in the basin. Outside of this GWMP, the primary enforcement mechanism in the Riverside Basin is anticipated to continue being the 1969 Western Judgment.

6.3 BASIN MANAGEMENT OBJECTIVES

The BMOs include definitions of acceptable groundwater levels, groundwater quality, land subsidence, and groundwater/surface water interaction within the sub-areas, along with actions to be taken when defined triggers are met.

6.3.1 MAINTAIN ACCEPTABLE GROUNDWATER LEVELS

Groundwater levels in the Colton and Riverside North basins are currently monitored through the 1969 Western Judgment which prescribes minimum groundwater levels in specific index wells and also maximum groundwater extraction for specified users and uses, with required

actions. A minimum elevation of 822.04 feet above sea level is defined for average static water levels within the Colton Basin and Riverside Basin within San Bernardino County based on the three wells listed in the 1969 Western Judgment: Flume 2, Flume 5, and Johnson 1 (see Figure 6.2). Total extraction is limited for Riverside County entities, separately, from Riverside North for use within Riverside County (21,085 AFY) and from Riverside South (29,633 AFY). This GWMP cannot change requirements and actions stipulated in the 1969 Western Judgment.

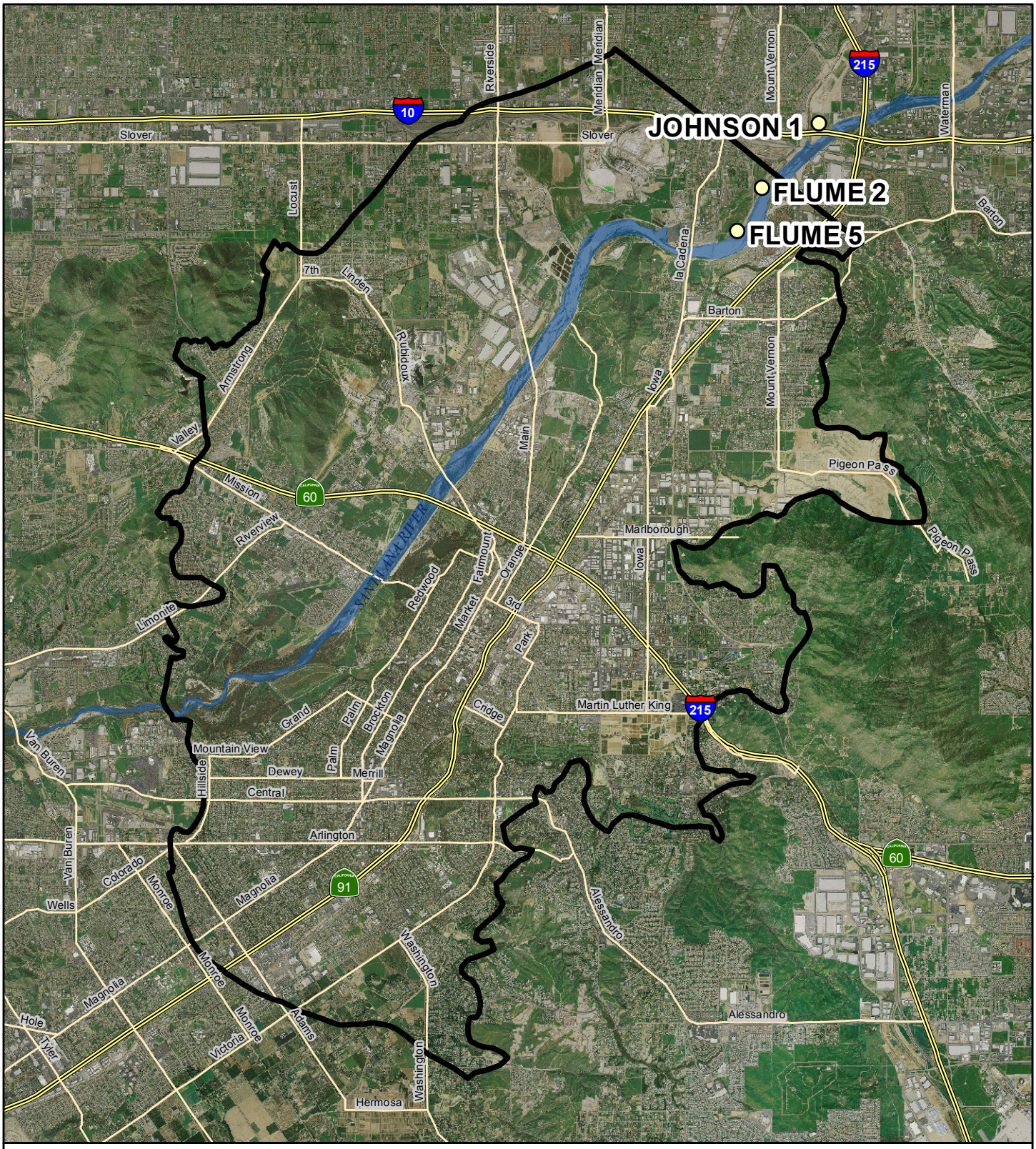
The groundwater level BMO for the Riverside Basin GWMP seeks to meet the requirements of the 1969 Western Judgment in a manner that is efficient and cost effective and that maintains water levels in the aquifer. Thus, the groundwater level BMO is to:

- Maintain the minimum elevation of 822.04 feet above sea level at the averaged Flume 2, Flume 5, and Johnson 1 wells.
- Maintain groundwater extraction from Riverside North and Riverside South within Base Rights:
  - Long-term combined average extractions from Colton and Riverside basins for use in Western can not exceed 54,099 AFY without replenishment.
  - Extractions from Colton and Riverside basins for use within Valley District are unlimited.

The 1969 Western Judgment requires Valley District to provide sufficient replenishment water to maintain the static water levels in the index wells at or above the 822.04 foot elevation. Western is required to provide replenishment if the sum of extractions in the Colton and Riverside basins exceeds the accumulated extractions credits in all these basins. The current amount of credit is 457,380 AF and the estimated credit in year 2030 is 460,000 AF.

Monitoring for this BMO is already performed by Western. Groundwater elevations at the index wells and groundwater extraction data are published in annual reports. No additional monitoring is required.

However, achieving the BMO in a manner that is efficient and cost-effective requires forward-looking actions. RAGFM will be used to estimate recharge actions required to maintain groundwater levels above the 822.04 foot minimum elevation. The volume of extraction above Base Rights will be estimated based on recent historical extraction data and on agency projections. Values will be estimated on an average annual basis. Average annual future groundwater extraction in excess of Base Rights will be estimated using historical data and information on current conditions. With this information, Valley District, Western, and their retail agencies can identify and develop mutually beneficial groundwater recharge projects with an equitable cost-share that allows for the continued compliance with the 1969 Western Judgment.



CITY OF RIVERSIDE

Water Level BMO Wells

Riverside Basin Groundwater Management Plan

2011

Figure 6.2

6.3.2 MAINTAIN OR IMPROVE GROUNDWATER QUALITY

The 1969 Western Judgment does not address water quality. Under certain specific conditions the Court has jurisdiction to modify the obligations of Valley District to include reasonable provisions for the maintenance of water quality. The Court has not modified Valley District's obligations.

The RWQCB has defined water quality objectives through the Basin Plan (see Section 1.6.3) for all sub-areas in the Plan Area based on nitrate and TDS concentrations. This GWMP will work within this framework to meet the Basin Plan objectives. Efforts will also be made to ensure that sufficient, high quality data are collected for future analyses of compliance with Basin Plan objectives. Triggers are defined as the following:

- Trigger 1: Average nitrate or TDS, as computed by RWQCB, exceeds 90 percent of the management objective.
- Trigger 2: Average nitrate or TDS, as computed by RWQCB, exceeds the management objective.

If Trigger 1 is met, the Advisory Committee will meet to discuss the situation, including an analysis of trends, potential impacts to groundwater users or the environment, and the most appropriate actions, both immediate and in the event that Trigger 2 levels are met. Actions will be based on GWMP elements defined in Section 7, Elements of the Groundwater Management Plan, and the projects defined in Section 8.1, Potential Projects. These actions may include:

- Continued operation
- Increased monitoring
- Studies of sources of contamination and additional options to manage water quality
- Altered desalter operation in surrounding basins or development of desalters in the basin
- Altered operation of recharge basins
- Reoperation or new wells to move production to other parts of the basin or different depths
- Substitution of alternate supplies

If Trigger 2 is met, the actions defined for Trigger 1 and any additional measures deemed necessary by the Advisory Committee may be implemented.

Groundwater quality BMO triggers are shown in Table 6.1.

Table 6.1
Groundwater Quality BMO Triggers

Sub-area	Nitrate as N Triggers (mg/L)		TDS Triggers (mg/L)		Current (2006) Status
	Trigger 1	Trigger 2	Trigger 1	Trigger 2	
Riverside-A	5.6	6.2	500	560	Not triggered
Riverside-B	6.8	7.6	260	290	Nitrate Trigger 2 TDS Trigger 2
Riverside-C	7.5	8.3	610	680	Nitrate Trigger 2 TDS Trigger 2
Riverside-D	9.0	10.0	730	810	Insufficient data
Riverside-E	9.0	10.0	650	720	Nitrate Trigger 2 TDS Trigger 1
Riverside-F	8.6	9.5	590	660	Nitrate Trigger 2

6.3.3 IMPLEMENT LAND SUBSIDENCE MONITORING

This BMO focuses on increased understanding of land subsidence in the basin through additional monitoring activities. Additional surveys by spirit-leveling, global positioning satellites (GPS), interferometric synthetic aperture radar (InSAR) analysis, and/or extensometers could better define the extent of subsidence within the Riverside Basin. Currently, the understanding of the problem is limited; studies have not been performed because there is no reported damage from subsidence. As monitoring becomes sufficiently cost-effective, new monitoring may be established and a quantitative BMO may be established under the reporting and updating element in Section 7.4.5. A benefit of InSAR analysis is its ability to use historical imagery to estimate subsidence, limiting the need for establishment of baseline conditions.

6.3.4 MANAGE THE INTERACTION OF SURFACE WATER AND GROUNDWATER FOR THE MAINTENANCE OF GROUNDWATER AND SURFACE WATER QUANTITY AND QUALITY

This BMO seeks to manage changes in surface flow and surface water quality that directly affect groundwater levels or quality or are caused by groundwater pumping in the basin. As discussed in Section 2.3.8, groundwater and surface water in the Riverside Basin are closely linked. The Santa Ana River is a major source of recharge to the groundwater basin, and the groundwater basin also contributes water to the lower reaches of the Santa Ana River. The linkage in water quality and quantity in surface water and groundwater also is recognized in the 1969 Western Judgment and the Orange County Judgment, as discussed in Sections 1.6.1 and 1.6.2, respectively.

No quantitative thresholds are set for this BMO; however, the following are qualitative objectives for maintaining or improving the interaction of surface water and groundwater:

- Water quality in the Santa Ana River will be maintained at a level to support the beneficial uses of groundwater in the basin, as the Santa Ana River is a major source of recharge to the basin and many potable wells in the basin may be under the influence of the river.
- Water quantity in the Santa Ana River will be maintained at a level to continue current levels of groundwater recharge, as the Santa Ana River is a major source of recharge to the basin.
- Water quality in groundwater will be maintained at a level to support the beneficial uses of the Santa Ana River, as groundwater discharges to the Santa Ana River in the vicinity of Riverside Narrows.
- Groundwater levels near the Santa Ana River will be maintained at a level that supports the Santa Ana River flow required for downstream users.

Monitoring streamflow, groundwater levels, and water quality in both the Santa Ana River and in groundwater will allow for tracking the success of meeting these objectives.

7 ELEMENTS OF THE GROUNDWATER MANAGEMENT PLAN

The elements of the GWMP are the actions that, when implemented, are intended to meet the defined objectives and goal. California Water Code Section 10753.8 states that a GWMP may include components relating to all of the following:

- Control of saline water intrusion
- Identification and management of wellhead protection areas and recharge areas
- Regulation of migration of contaminated groundwater
- Administration of a well abandonment and well destruction program
- Mitigation of overdraft conditions
- Replenishment of groundwater extracted by water producers
- Monitoring of groundwater levels and storage
- Facilitation of conjunctive use operations
- Identification of well construction policies
- Construction and operation by the local agency of groundwater contamination cleanup, recharge, storage, conservation, water recycling, and extraction projects
- Development of relationships with state and federal regulatory agencies
- Review of land use plans and coordination with land use planning agencies to assess activities that create a reasonable risk of groundwater contamination

Additionally, as described in Section 1.9, there are numerous recommended items to include in GWMPs. These include the following:

- Monitoring and management of groundwater levels, groundwater quality, inelastic land surface subsidence, and changes in surface flow and surface water quality that directly affect groundwater levels or quality or are caused by groundwater pumping
- A plan to involve other agencies that enables the local agency to work cooperatively with other public entities whose service area or boundary overlies the groundwater basin
- Public outreach and stakeholder involvement

These elements are grouped into broad categories in Figure 7.1 and Table 7.1 to show how they interact to allow the stakeholders to move toward the GWMP goal of operating the groundwater basin in a sustainable manner for reliable supply for beneficial uses. Elements and actions defined under the Groundwater Volume, Groundwater Quality, and Surface Water/Groundwater Interaction categories all pass through a monitoring element which allows for policy decisions based on reporting, coordination, and stakeholder involvement. Table 7.1 relates the individual elements to the categories and to the objectives. The remainder of this section addresses each element, including actions.

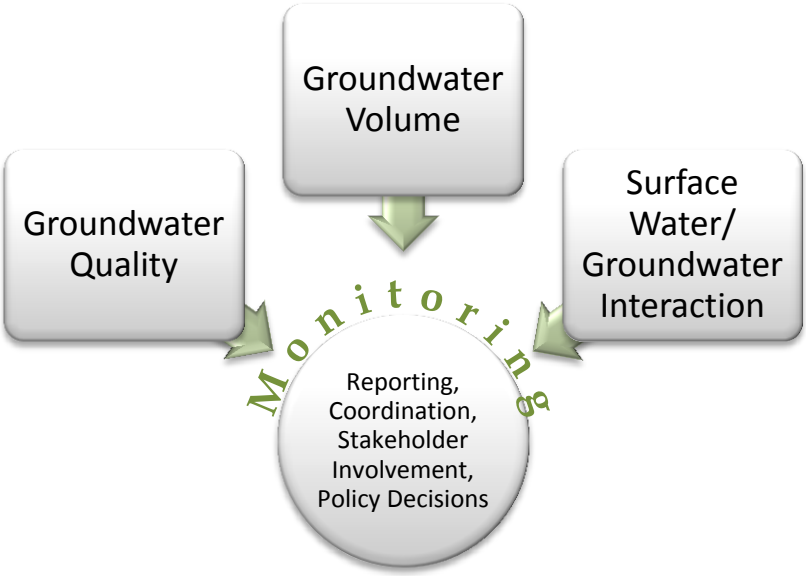


Figure 7.1
Interaction and Grouping of GWMP Elements

Table 7.1
Summary of GWMP Objectives and Elements

Item	BMOs			
	Maintain Acceptable Groundwater Levels	Maintain or Improve Groundwater Quality	Implement Land Subsidence Monitoring	Manage Interaction of Surface Water And Groundwater
Groundwater Volume				
Mitigation of overdraft conditions	✓	✓		✓
Replenishment of groundwater extracted by water producers	✓	✓		✓
Facilitation of conjunctive use operations	✓	✓		✓
Groundwater Quality				
Control of saline water intrusion		✓		✓
Identification and management of wellhead protection areas and recharge areas	✓	✓		✓
Regulation of migration of contaminated groundwater		✓		✓
Administration of a well abandonment and well destruction program		✓		✓
Identification of well construction policies		✓		✓
Construction and operation by the local agency of groundwater contamination cleanup, recharge, storage, conservation, water recycling, and extraction projects	✓	✓		✓
Monitoring				
Monitoring of groundwater levels and storage	✓			✓
Monitoring of groundwater quality		✓		✓
Monitoring of surface water/groundwater interaction	✓	✓		✓
Monitoring of inelastic land subsidence			✓	
Reporting, Coordination, Stakeholder Involvement, Policy Decisions				
Stakeholder involvement	✓	✓	✓	✓
Development of relationships with state and federal regulatory agencies	✓	✓	✓	✓
Coordination with IRWMP efforts	✓	✓	✓	✓
Review of land use plans and coordination with land use planning agencies to assess activities that create a reasonable risk of groundwater contamination	✓	✓		✓
Reporting and updating	✓	✓	✓	✓

7.1 GROUNDWATER VOLUME

Groundwater volume elements include mitigation of overdraft conditions, replenishment of groundwater extracted by water producers, and facilitation of conjunctive use operations.

7.1.1 MITIGATION OF OVERDRAFT CONDITIONS

Overdraft conditions can be addressed through reduced pumping or increased recharge. Such programs are best undertaken on a regional scale, to share costs and benefits in a cooperative, voluntary manner. Recharge may be required through the enforcement of the 1969 Western Judgment, if its extraction-based and water-level-based thresholds are crossed. Groundwater recharge projects (such as those briefly described in Section 8.1) using both Santa Ana River water and recycled water to replenish the basin will be critical in reducing overdraft if it occurs. Imported water may also be a source for future direct or in-lieu recharge projects. The groundwater recharge projects described in Section 8, Implementation (specifically the Riverside North Aquifer Storage and Recovery Project), are essential components of meeting projected demands in the Riverside Basin.

Managing the volume pumped from the aquifer can also mitigate overdraft. Historical data and projected groundwater production estimates can form the basis for cooperative agreements between willing participants on future pumping.

Actions

A1. *Meet with stakeholders to discuss the modeling results and determine the ability of the basin to meet projected groundwater demands.*

A2. *With willing participants, develop equitable methods to reduce future basin-wide groundwater production through development of alternate supplies, limits, fees, incentives, or other means.*

A3. *With willing participants, develop equitable methods to fund and construct recharge facilities or projects to enhance recharge facilities.*

A4. *Perform a study to determine if the requirements of the 1969 Western Judgment are adequate for maintaining a sustainable groundwater supply. (note that Index wells are not intended to be representative of the basin as a whole and extractions by Valley District users are unlimited).*

7.1.2 REPLENISHMENT OF GROUNDWATER EXTRACTED BY WATER PRODUCERS

Existing replenishment requirements are contained in the 1969 Western Judgment. Additional groundwater replenishment will take place to increase stored water in the aquifer for normal and drought periods. Replenishment will occur on a voluntary basis as economically feasible project locations and water sources become available.

Actions

B1. *Implement direct recharge of recycled water, storm water, and other surface water.*

B2. *Substitute other water supplies such as water from desalters, treated lower quality groundwater, imported water, and recycled water for high quality groundwater.*

B3. *Implement conservation efforts.*

B4. *Select recharge water to best manage the quality of the recharge water and the quality of the receiving waters.*

B5. *Consider a replenishment fee on a per-acre-foot basis above a baseline amount, or other method, to fund regional replenishment activities.*

7.1.3 FACILITATION OF CONJUNCTIVE USE OPERATIONS

Conjunctive use operations can replenish groundwater to support compliance with the 1969 Western Judgment and to meet BMOs. Conjunctive use in the Riverside Basin may take the form of direct recharge through spreading basins near sources of water and near high permeability soils, such as along the Santa Ana River or along mountain fronts. Conjunctive use could also take the form of in-lieu recharge, in which other supply sources, such as imports or recycled water, may replace groundwater, enabling pumping of groundwater during times of reduced imported water supplies.

Action

C1. *Develop, implement, and maintain programs and projects to recharge aquifers. Programs may be local or regional in scope and will be designed so as not to have an adverse impact on groundwater quality.*

7.2 GROUNDWATER QUALITY

7.2.1 CONTROL OF SALINE WATER INTRUSION

The threat of saline water intrusion in the Riverside Basin includes the potential migration of relatively higher TDS water from the Arlington Basin immediately to the south. The lack of significant groundwater flow from the Arlington Basin into the Riverside Basin limits the ability of lower quality water to enter the Riverside Basin. Continued control of this migration

includes using Western's desalters in the Arlington Basin to remove salts and prevent high groundwater levels in the area; in addition, limited or carefully planned pumping in the southern Riverside Basin can avoid pulling the lower quality water toward the Riverside Basin. Groundwater levels and the groundwater model results suggest little or no movement of saline water into the Riverside Basin.

Actions

D1. *When deemed cost-effective, develop desalter wells in the southern portion of the Riverside Basin, neighboring Arlington Basin, or in other relatively saline areas close to Brine Line infrastructure. Desalter wells will be used as a supply source and to control saline water intrusion.*

D2*. Manage water levels in Riverside South to avoid migration of higher TDS groundwater in the Arlington Basin into Riverside South.*

7.2.2 IDENTIFICATION AND MANAGEMENT OF WELLHEAD PROTECTION AREAS AND RECHARGE AREAS

The entire Riverside Basin is a source of recharge and requires protection to ensure high quality recharge and to maintain or enhance existing recharge quantities. The Santa Ana River is the single most important recharge source in the basin. With seasonally significant streamflow and coarse-grained soils to transmit water into the aquifer, the ability of the Santa Ana River area to recharge the groundwater system should be maintained. Away from the river, the highest priority for recharge preservation is areas with soils conducive to recharge. Figure 2.4 shows areas identified as Hydrologic Soils Group A. This group tends to allow water to infiltrate into the ground rather than run off at the surface. Areas covered by these soils are important for recharge quantity and are also points of vulnerability for contaminants to enter the groundwater aquifer. Existing recharge is largely controlled by soil conditions and land use (including presence of impervious surfaces as well as applied water) and is shown in Figure 7.2.

Drinking water source assessments produced by the groundwater agencies have identified uses that threaten groundwater quality in the Riverside Basin along with delineation of capture zones around wells. Monitoring these uses is important for maintaining groundwater quality. Additionally, land use decisions should consider potential long-term groundwater quality. Existing uses that threaten some wells in the basin include:

- Airports - maintenance/fueling areas
- Automobile - gas stations
- Chemical/petroleum processing/storage
- Dry cleaners
- Electrical/electronic manufacturing
- Funeral services/graveyards
- Historic gas stations

- Injection wells/dry wells/sumps
- Known contaminant plumes
- Machine shops
- Metal plating/finishing/fabricating
- Military installations
- Other animal operations
- Parks
- Plastics/synthetics producers
- Schools
- Sewer collection systems
- Underground storage tanks - confirmed leaking tanks
- Wastewater treatment plants

Reducing septic system use in the basin by providing sanitary sewer connections is a priority for wellhead protection. Septic areas are located in the North Orange/High Grove area and are potential sources of nitrate contamination. A Riverside city ordinance prohibits new septic systems in areas deemed at risk to contamination from nitrates, chemicals, and pathogens.

Actions

E1. *Preserve and protect aquifer recharge areas, especially along the Santa Ana River.*

E2. *Implement public outreach efforts for recharge areas, stormwater management, and dumping.*

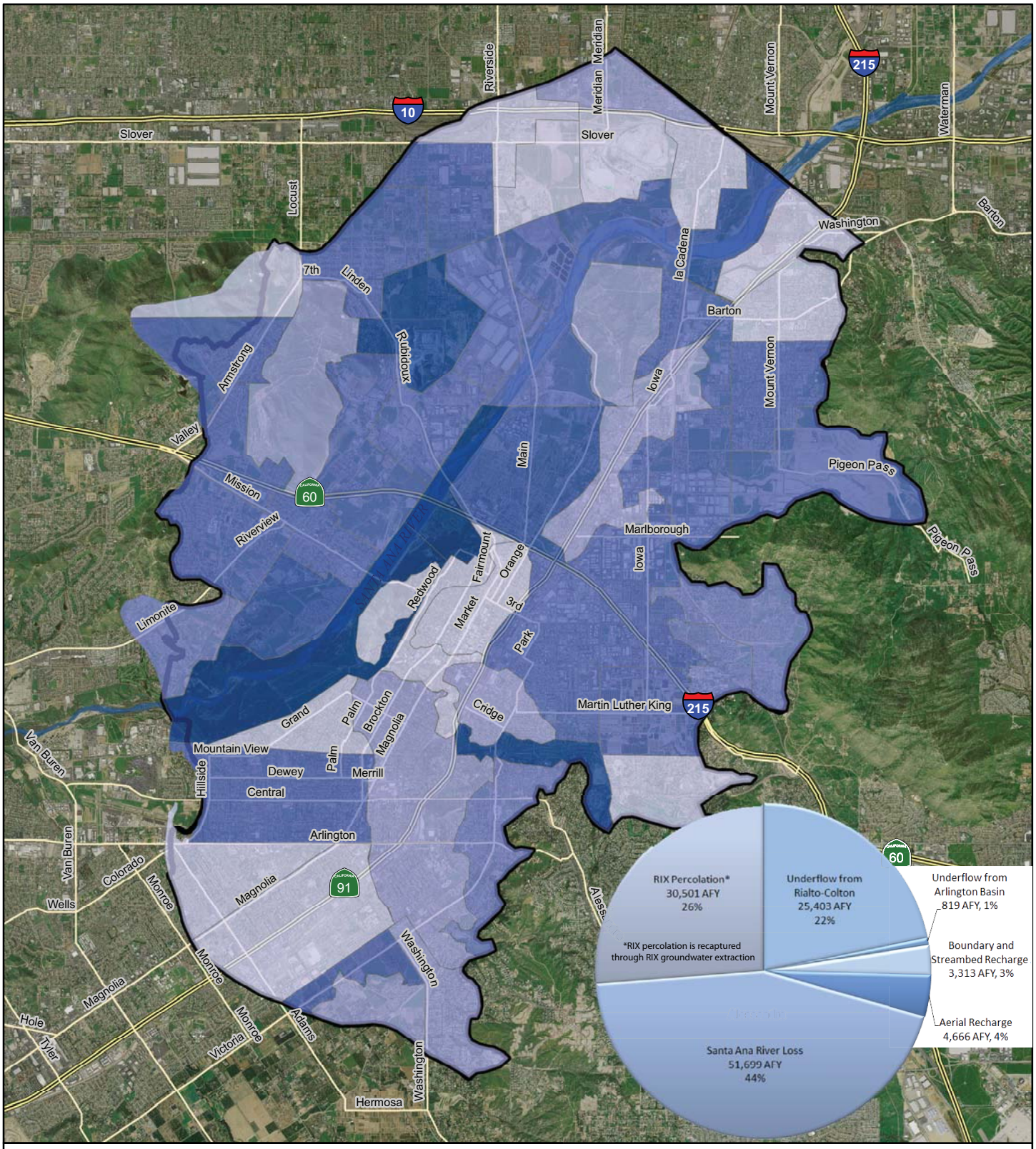
E3. *Design recharge facilities to minimize pollutant discharge into storm drainage systems, natural drainage, and aquifers.*

E4. *Provide sewer system connections to areas currently on septic systems, and limit new septic systems in the Plan Area.*

E5. *Decrease storm water runoff, where feasible, by reducing paving in development areas and by using design practices such as permeable parking bays and porous parking lots with bermed storage areas for rainwater detention. Exercise caution to avoid contamination from oil, gasoline, and other surface chemicals.*

E6. *Manage streams with natural approaches, to the maximum extent possible, where groundwater recharge is likely to occur.*

E7. *Offer incentives to landowners to develop their property in a manner to maintain or enhance its retention as a natural groundwater recharge area. These incentives will encourage the preservation of natural water courses without creating undue hardship on property owners and might include density transfer functions.*



Legend

- Plan Area
- Freeway
- Roads
- Lower Aerial Recharge
- Higher Aerial Recharge

Source: WRIME, 2011

N W E S

0 0.5 1 2 Miles

CITY OF RIVERSIDE

Existing Sources of Recharge

Riverside Basin Groundwater Management Plan

2012

Figure 7.2

7.2.3 REGULATION OF THE MIGRATION OF CONTAMINATED GROUNDWATER

It is important to regulate contaminated groundwater migration both for protecting existing sources of groundwater and for developing new sources of groundwater. Coordination with regulatory agencies, neighboring agencies and municipalities (notably the City of Rialto), and potentially responsible parties will give water managers input into the cleanup and containment of contaminated sites and will improve long-term planning efforts based on the predicted impact of those hazards. Additionally, new, improved, and more cost-effective treatment technologies can potentially result in additional potable or non-potable supplies from groundwater that was previously considered unavailable for use.

Actions

F1. *Coordinate with local regulatory agencies to share information about contaminated sites and the basin groundwater system and wells. Investigate new treatment systems that can provide potable or non-potable water as new supply sources.*

F2. *Develop a regional groundwater quality model to improve the ability to analyze the quality impacts of management decisions.*

7.2.4 ADMINISTRATION OF A WELL ABANDONMENT AND WELL DESTRUCTION PROGRAM

Abandoned or poorly constructed wells should be properly destroyed to prevent migration of contaminants down well bores to the aquifer or across clay layers within the aquifer. Well destruction in the basin is administered by Riverside County Community Health Agency's Department of Environmental Health (DEH) and San Bernardino County Department of Environmental Health Services (DEHS). Destruction of wells is performed in accordance with the procedures in DWR's *California Well Standards*, Bulletin 74-90 (1990).

Actions

G1. *Survey abandoned wells in the basin both physically and from county records.*

G2. *Coordinate with DEH and DEHS on destruction standards and procedures, as well as on logging of status of abandoned and destroyed wells.*

7.2.5 IDENTIFICATION OF WELL CONSTRUCTION POLICIES

Well construction in the basin is administered by DEH in Riverside County and the DEHS in San Bernardino County.

DEH issues permits for construction and/or abandonment of all water wells including, but not limited to driven wells, monitoring wells, cathodic wells, extraction wells, agricultural wells, and community water supply wells. The wells are inspected during different stages of construction to help verify standards are being met. All drinking water wells are evaluated

once installation is complete to ensure compliance with California Well Standards in DWR's *California Well Standards*, Bulletin 74-90 (1990) and with minimum drinking water standards.

DEHS inspects and permits small community and non-community water systems that serve water to the public. They also protect water sources from pollution by permitting and inspecting construction and destruction of wells. Wells are required to meet California Well Standards in DWR's *California Well Standards*, Bulletin 74-90 (1990). DEHS conducts field visits to verify that the surface features of the well meet these standards.

Actions

H1. *Coordinate with DEH and DEHS staff to ensure they are aware of local and regional contamination plumes. Increased caution or restrictions may be necessary near these plumes.*

7.2.6 CONSTRUCTION AND OPERATION BY THE LOCAL AGENCY OF GROUNDWATER CONTAMINATION CLEANUP, RECHARGE, STORAGE, CONSERVATION, WATER RECYCLING, AND EXTRACTION PROJECTS

Properly designed, constructed, and operated projects can cost-effectively move Riverside Basin towards meeting water quantity, water quality, and subsidence objectives.

These projects include the following:

- Groundwater contamination cleanup

  Action

  I1. *Cost-effectively clean up or contain point-source (e.g., DBCP, TCE, perchlorate) and non-point-source (e.g., nitrate and TDS) contamination in the groundwater basin. Point-source cleanup activities will include interfacing with regulatory agencies, potentially responsible parties, and other nearby agencies and municipalities. These actions will seek to return the contaminated area, to the extent possible, to a water supply source. Cleanup activities will be performed by the potentially responsible parties and the regulatory agencies. Payment for impacts to the water system will be sought from the potentially responsible parties. Non-point source contamination cleanup may include development of desalter wells, as previously discussed in Section 7.2.1, Control of saline water intrusion.*

- Recharge

  Action

  I2. *Construct and operate projects to recharge acceptable-quality surplus water to the groundwater basin. Recharge water may include storm water, surface water, recycled water, or imported water. Recharge water will be selected to mutually benefit groundwater quantity and quality. Recharged water may be captured through existing pumping facilities or through additional facilities.*

- Storage – Additional surface storage, while beneficial, is not anticipated in the Plan Area beyond small scale water harvesting and detention basins.
- Conservation – Conservation is a key part of water demand management in the basin. RPU and Western are signatories to the MOU of the California Urban Water Conservation Council (CUWCC) and participate in demand-side management measures. These agencies have committed to implement best management practices to reduce water demand. Basin agencies also participate in Metropolitan's "Save Water – Save a Buck" water conservation incentive program. Western has been especially active in developing outreach for water-efficient landscapes.

  Actions

  I3. *Participate in CUWCC programs.*

  I4. *Encourage installation of water-conserving systems such as dry wells and gray water systems where feasible, especially in new developments. Also encourage installation of cisterns or infiltrators to capture rainwater from roofs for irrigation in the dry season and flood control during heavy storms. Include education programs to protect groundwater quality.*

  I5. *Support outreach programs to promote urban and agricultural water conservation and widespread use of water saving technologies.*

- Water recycling – There is potential for increased usage of recycled water from the tertiary treatment plants: Riverside RWQTP, City of Rialto's Municipal Wastewater Treatment Plant, and the RIX facility. In some cases, the distance from these facilities to the operators' potential service areas suggests the need to cooperate regionally to develop cost-effective solutions to fully utilize this resource. Potential users of recycled water will be identified based on conveyance costs as well as on the volume, timing, and quality needs of the potential end users.

  Actions

  I6. *Develop partnerships with treatment plant operators and water purveyors to allow use of recycled water in the nearby area. Efforts will be made to more fully utilize effluent from Riverside's RWQTP for non-potable uses, such as exchanges with the Gage Canal Company or expansion of the existing distribution system as explored in the City of Riverside's Recycled Water Master Plan (Parsons, 2003). Use of recycled water must balance the need for Santa Ana River in-stream flow as established in the Orange County Judgment.*

- Extraction – Additional groundwater extraction wells will likely be necessary to meet future demand.

  Actions

  I7. *Focus new wells on underutilized sources, such as contaminated water treated with granular activated carbon and membrane technologies and areas of high groundwater. Additional wells also may need to be installed in the primary aquifer to meet demand. Groundwater modeling will*

be performed during the planning stages to ensure there are no significant impacts. New wells may be paired with recharge facilities to reduce impacts.

7.3 MONITORING AND MANAGEMENT

7.3.1 GROUNDWATER LEVELS AND STORAGE

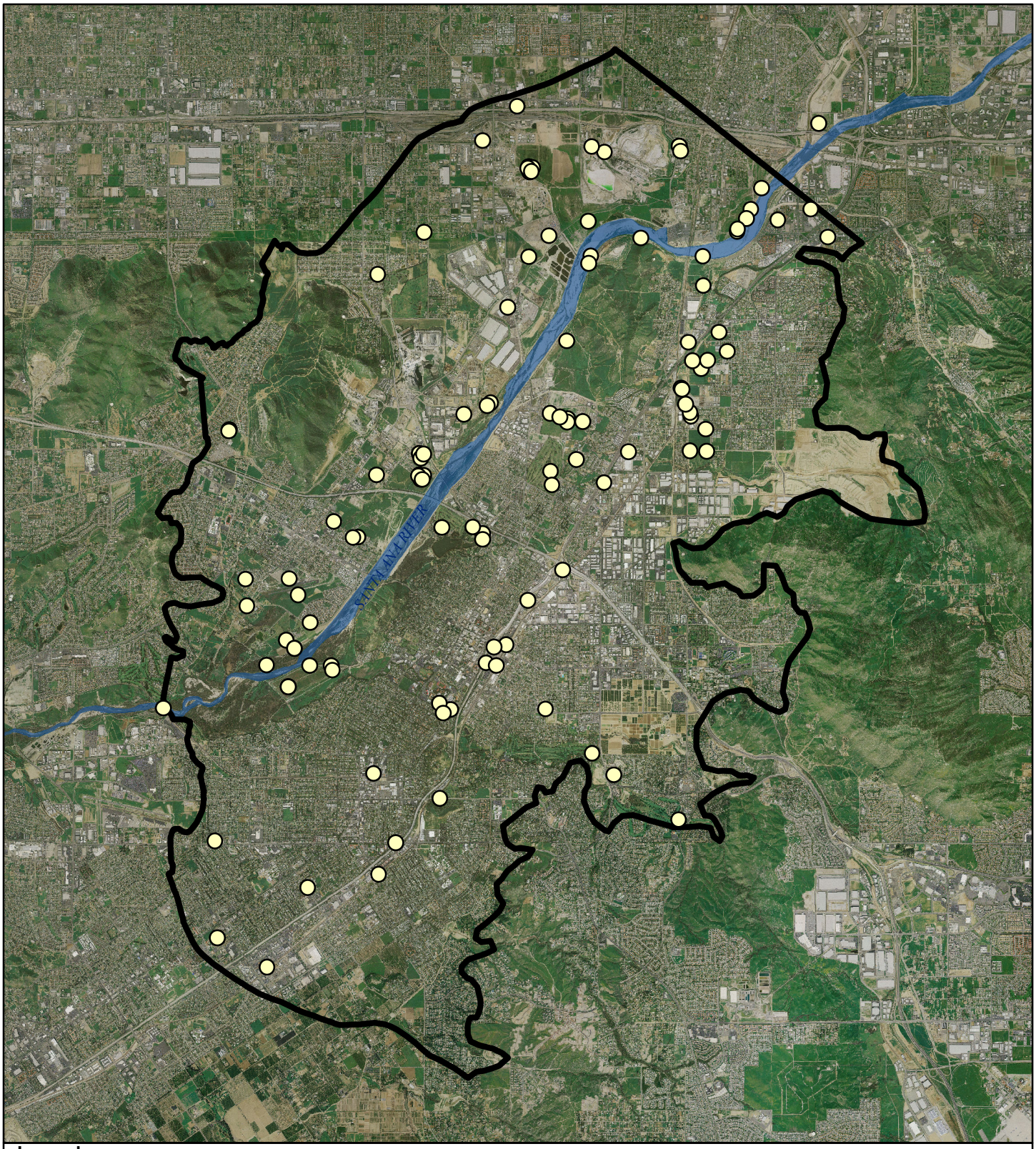
The Riverside Basin has extensive monitoring of groundwater levels and storage to meet the mandates of the 1969 Western Judgment and the needs of the individual water agencies. Monitoring protocols are included in Appendix D. Coordination between the agencies occurs through Western's monitoring activities; however, additional coordination is needed to make existing and future monitoring as complete as possible with respect to spatial distribution and timing.

Figure 7.3 shows all wells in the Riverside Basin at which water level have been measured at least once in the 5-year period 2003 – 2007 with available data in the Cooperative Well Measuring Program Database. To the extent possible, static groundwater level monitoring should continue at all wells that are currently or have recently been measured, as shown in Figure 7.3. Water levels should be measured minimally in the spring (within a month of April 15), and fall (within a month of November 15). Data logging pressure transducers should be installed in areas lacking good data coverage to determine variability between readings, which may refine future timing of groundwater level measurements. Measurements should be taken when the well and nearby wells are not pumping, to represent static water levels. If static conditions cannot be obtained, the pumping status at the well and nearby wells should be noted and preserved in the database, if possible.

All water level data will be incorporated into the existing SAWPA databases to support broader regional water management efforts. Additionally, a portion of the water levels will be monitored and reported to DWR as part of the CASGEM program to comply with SBx7 6. Additional monitoring protocols are provided in Appendix D. RAGFM is a key element in monitoring and managing groundwater levels and storage in the Riverside Basin. The model is used for the following:

- Improve understanding of the groundwater system
- Aggregate, organize, and analyze existing data
- Identify data gaps
- Simulate impacts on groundwater levels and storage of various programs and projects and of continuation of existing operations

RAGFM is available from RPU or Western for use by any interested stakeholder. Output from the model is used in this GWMP to ensure that projects are designed to meet the stated goal and objectives.



Legend

- Groundwater Level Monitoring Wells*
- Plan Area
- Highways
- Roads

* Groundwater Level Monitoring Wells are a subset of wells in the Cooperative Well Measuring Program that have groundwater measurment records from 2003 to 2007, locations derived from AWQ Database

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CITY OF RIVERSIDE

Wells Monitored for Groundwater Levels

Riverside Basin Groundwater Management Plan

2011

Figure 7.3

Actions

J1. *Continue the existing static groundwater monitoring program performed by Western with consistent wells and timing of measurements.*

J2. *Ensure compliance with SBx7 6 through participation in DWR's CASGEM program.*

J3. *Coordinate among agencies to ensure that wells continue to be monitored to provide long-term records of static water levels at specific locations, and to ensure a consistent and complete dataset.*

J4. *Install additional data logging pressure transducers where needed to better understand water level fluctuations at finer time scales than captured from the manual water level monitoring. Install transducers at locations to fill data gaps, including areas of interest, such as near recharge areas, contaminated sites, or areas of significant pumping. Maintain transducers in BMO wells, which will also be monitored monthly manually.*

J5. *Fill gaps in the water level monitoring network by sampling additional existing or newly constructed monitoring wells.*

J6. *Improve understanding of bedrock topography through geophysical surveying.*

J7. *Extend groundwater modeling capabilities through the development of a groundwater quality model and an expanded regional groundwater flow model to include surrounding basins.*

7.3.2 GROUNDWATER QUALITY

Water quality monitoring is performed for Title 22 compliance by the water agencies. Figure 7.4 shows the locations of wells monitored for water quality at least once in the most recent 5-year period (2003 – 2007) with available data in the Ambient Water Quality Database, which is now part of SAWDMS. Monitoring protocols are contained in Appendix D. Additional water quality monitoring is needed to ensure sufficient data to define nitrate and TDS concentrations for use by RWQCB and for the water quality BMOs in this GWMP, as well as to identify the presence or migration of other contaminants of concern. In the most recent update of ambient groundwater monitoring (Wildermuth, 2011), there were insufficient data to compute nitrate and TDS concentrations for the Riverside-D Management Zone (see Figure 1.8). Coordination with RWQCB and SAWPA can help define additional monitoring needs for this ambient groundwater monitoring study. Coordination between the agencies is needed to make existing and future monitoring as complete as possible with respect to the following:

- Spatial distribution
- Depth interval
- Timing
- Analytes

Actions

K1. *Continue groundwater quality monitoring as required to meet Title 22 requirements.*

K2. *Continue to incorporate all groundwater quality data into the existing SAWPA databases to support broader regional water management efforts.*

K3. *Standardize data collection protocols and timing through coordination among agencies.*

K4. *Fill gaps in the water quality monitoring network through sampling additional existing or newly constructed monitoring wells. Filling data gaps will provide better water quality representation for Basin Plan compliance with nitrate and TDS objectives, improved understanding of water quality conditions for well siting, improved monitoring of migration of saline water, and more data for future water quality modeling.*

K5. *Coordinate with the USGS on its National Ambient Water Quality Assessment program and its Groundwater Ambient Monitoring and Assessment program to potentially integrate its efforts with local monitoring efforts.*

7.3.3 CHANGES IN SURFACE FLOW AND SURFACE WATER QUALITY THAT DIRECTLY AFFECT GROUNDWATER LEVELS OR QUALITY OR ARE CAUSED BY GROUNDWATER PUMPING

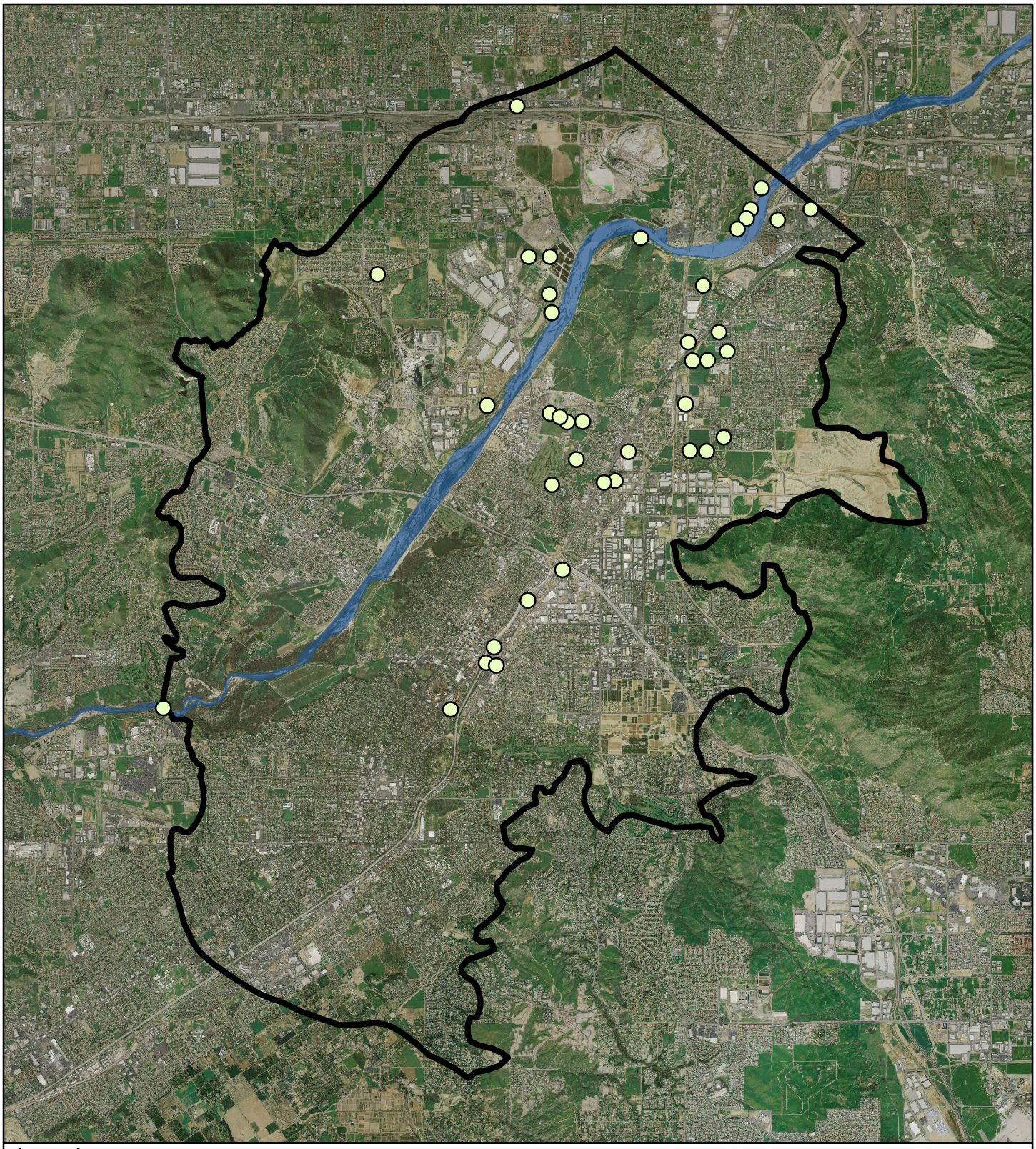
Groundwater/surface water interaction is complex and monitoring and managing those interactions requires significant data. Surface water resources are important to Riverside Basin groundwater. Nearly 54,000 AFY of recharge is provided by the Santa Ana River, almost half of the total basin inflow of 120,000 AFY. Identification, protection, and improvement of this recharge source is important to continued basin recharge.

There is currently groundwater level monitoring along the Santa Ana River, streamflow monitoring upstream and downstream of the basin, and water quality monitoring in the river and the groundwater. This monitoring should continue into the future and the ability of the monitoring to meet ongoing data needs should be regularly evaluated.

Actions

L1. *Continue coordination with the USGS, RWQCB, and local agencies that collect data necessary to analyze surface flow and surface water quality changes directly affecting groundwater levels or quality or are caused by groundwater pumping.*

L2. *Regularly evaluate ongoing programs to ensure data collection is sufficient to meet the needs for monitoring and managing groundwater/surface water interaction. Specifically, ensure data collection continues in wells along the Santa Ana River and at streamflow gages Santa Ana River at E Street at I-10; Santa Ana River at Metropolitan Crossing at Riverside Narrows; Warm Creek near San Bernardino; and Lytle Creek at Colton.*



Legend

- Groundwater Quality Monitoring Wells*
- Plan Area
- Highways
- Roads

* Groundwater Quality Monitoring Wells are derived from the AWQ Database and have records from 2003 to 2007

N
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0 0.5 1 2 Miles

CITY OF RIVERSIDE

Wells Monitored for Groundwater Quality

Riverside Basin Groundwater Management Plan

2011

Figure 7.4

7.3.4 INELASTIC LAND SUBSIDENCE

Monitoring of land subsidence in the Riverside Basin is limited by the cost of traditional surveys and extensometers compared to the limited historical impact of subsidence in the basin. If land subsidence is reported in the area, or if water levels drop below historical lows, additional land subsidence monitoring will be considered. New technology, such as InSAR supported by GPS, allows for more cost-effective, regional-scale, land subsidence monitoring. Over time, these technologies are becoming less expensive. Lower costs and opportunities to partner with others such as the USGS may enable land subsidence monitoring in the future.

Actions

M1. *Collect evidence, if any, of active inelastic land subsidence and assess the risk.*

M2. *Develop a land subsidence monitoring program, if needed, using InSAR, GPS, or traditional surveying and extensometer methods.*

M3. *Partner with the USGS or nearby agencies to implement any needed monitoring.*

7.4 COORDINATED PLANNING

7.4.1 STAKEHOLDER AND AGENCY INVOLVEMENT

Ongoing stakeholder involvement, including private groundwater producers and other agencies in the Plan Area as shown in Figure 1.3, is critical to successful implementation of the GWMP. Interested parties include agencies within and near the basin, downstream users of the Santa Ana River, environmental interests, and individuals and groups that rely on the groundwater basin for water supply. Coordination with these groups is necessary to ensure that the goal and objectives continue to be consistent with the desires of the community, that a full range of alternatives are considered along with potential adverse impacts, and that progress can be made toward meeting the goal and objectives.

Actions

N1. *Distribute the GWMP in an electronic format to all parties that have expressed interest in the plan, including all agencies within and bordering the basin.*

N2. *Develop an MOU and an Advisory Committee for implementation.*

N3. *Hold semi-annual meetings of the Advisory Committee to discuss ongoing groundwater management issues and activities. These discussions will include other agencies, thus enabling cooperation between public entities whose service areas or boundaries overlie the groundwater basin. Meetings will focus on potential development of more detailed governance, progress towards meeting BMOs, implementation of projects in the GWMP, new or updated status on the condition of the groundwater basin, and new or updated plans or strategies.*

N4. *Reorient the GWMP web site from its current plan-development focus to an implementation focus, highlighting implementation activities and soliciting public input.*

N5. *Present actions implemented by the agencies at public meetings of the respective boards.*

N6. *Provide public notice for any revisions to the GWMP.*

7.4.2 DEVELOPMENT OF RELATIONSHIPS WITH STATE AND FEDERAL REGULATORY AGENCIES

Federal and state regulatory agencies with which to develop relationships include the following:

- Federal
  - EPA – contaminated sites
  - USGS – aquifer and watershed conditions, groundwater and surface water monitoring
- State
  - DPH – drinking water quality and vulnerability
  - DTSC – contaminated sites
  - DWR – aquifer conditions, SWP, CASGEM
  - RWQCB – surface water quality and groundwater quality, permitting
  - SWRCB – water rights

Actions

O1. *Coordinate with these federal and state agencies on issues related to monitoring, water rights, and contaminated sites as well as on opportunities for grant funding and loans.*

7.4.3 COORDINATION WITH IRWMP EFFORTS

As noted in Section 1, Introduction and Background, the Plan Area includes two IRWMP efforts: the Upper Santa Ana Watershed IRWMP and the Western IRWMP. Coordination during implementation of the GWMP with these IRWMP efforts is important to ensure that local efforts help meet regional goals and vice-versa.

Actions

P1. *Ensure that at least one member of the Advisory Committee is actively involved in the coordination of both the IRWMPs and the GWMP. These members will provide dialogue between the two efforts.*

7.4.4 REVIEW OF LAND USE PLANS AND COORDINATION WITH LAND USE PLANNING AGENCIES TO ASSESS ACTIVITIES THAT CREATE A REASONABLE RISK OF GROUNDWATER CONTAMINATION

As discussed in Section 7.2.2, Identification and management of wellhead protection areas and recharge areas, certain land uses and activities can potentially negatively impact groundwater quality. Avoiding these uses in recharge areas and near wells is a better strategy than mitigation once the land uses are already in place.

Actions

Q1. *Coordinate between stakeholders and land use planning agencies to encourage protection of the groundwater resource by limiting activities that create an unreasonable risk to groundwater. Maps of well locations, or general areas of groundwater production, with recharge areas (Figure 7.2) will be provided to assist land use planning agencies in their decision process.*

Q2. *Monitor environmental impact reports and comment on such reports to ensure that the water resources are protected.*

Q3. *Involve water agencies through water supply assessments as required under SB 610. The water supply assessment documents water supply sufficiency by identifying sources of water supply, quantifying water demands, evaluating drought impacts, and providing a comparison of water supply and demand.*

7.4.5 REPORTING AND UPDATING

Reporting on the status of the GWMP implementation provides feedback to the stakeholders on the actions and projects listed in the plan. Updating the plan is necessary to reflect changing conditions and understanding of the basin.

Actions

R1. *Report on the GWMP's implementation progress every 2 years, and include details on monitoring activities, trigger status of BMOs, project implementation, and new or unresolved issues. Post reports and status tables or maps for BMOs on the Internet.*

R2. *Update the GWMP every 5 years, unless changes in basin conditions warrant a different frequency. Updates will be limited to those sections that require updating. The public will be notified of the update and the update will be performed with input from the public and the Advisory Committee.*

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8 IMPLEMENTATION

Implementation of the GWMP involves performing the actions described in Section 7, Elements, to meet the BMOs and achieve the overall goal of the basin, which is to operate the Riverside Basin in a sustainable manner to maintain a reliable water supply for all beneficial uses.

For individuals and water retailers that have maintained production levels at or below their average base period extractions and plan to remain below this threshold in the future, their involvement in the actions described in Section 7 can be minimal. However, for water retailers that have or intend to increase production from the Riverside Basin to levels beyond their average base period extractions; greater involvement in the actions described in the Elements Section will be necessary to meet the BMOs.

Several of the actions described in Section 7 are currently in place among water retailers relying on groundwater from the Riverside Basin. These programs include the following:

- Conservation measures to reduce water use
- Outreach programs to inform their communities about local water quality and to promote water conservation
- Coordination with local regulatory agencies related to contaminated sites, contamination plumes, destruction of wells, and surface water monitoring
- Clean-up activates to remove non-point source contaminants
- Recycled water to meet irrigation demands
- Water level monitoring
- Water quality monitoring
- Sharing of collected water quality data wth SAWPA

The above listed programs will need to continue and potentially expand to meet the BMOs. For water retailers that do not have these programs in place, consideration should be given to implement as many of these programs as is economically feasible.

Additional actions described in Section 7 will be implemented through participation in the development, review, and release of the Riverside Basin GWMP and through future involvement with the Riverside Basin GWMP Advisory Committee.

The remaining actions will need to be developed and implemented through multi-agency projects/programs or as individual agency projects/programs to meet the BMOs and achieve the overall goal of the basin. There is cost associated with implementing projects and programs, thus the Advisory Committee and individual agencies will need to evaluate the benefits and cost of the proposed actions prior to prioritizing each individual project and program. A few of the proposed actions do not require immediate implementation, but were included as part of

this comprehensive plan to introduce them for discussion purposes and for potential future implementation.

The following list of actions has been identified as key programs / projects to be discussed for near-term implementation:

- Meet with stakeholders to discuss modeling results and the ability of the basin to meet the projected groundwater demands
- Develop an MOU and an Advisory Committee
- Coordinate among agencies to ensure that wells continue to be monitored to provide long-term records of static water levels at specific locations, and to ensure a consistent and complete dataset
- Participate in DWR's CASGEM program
- Fill gaps in the water level monitoring network by sampling additional existing or newly constructed monitoring wells
- Continue groundwater quality monitoring as required to meet Title 22 requirements and incorporate it into the existing SAWPA databases to support broader regional water management efforts
- Standardize data collection protocols and timing through coordination among agencies
- Fill gaps in the water quality monitoring network through sampling additional existing or newly constructed monitoring wells
- Develop, implement, and maintain programs and projects to recharge the Riverside Basin
- Develop equitable methods to fund multi-agency projects and programs

In addition to the proposed key programs / projects listed above, Section 8.1 characterizes planned multi-agency and individual agency projects that may be implemented in the near-term to support the BMOs. The potential projects were analyzed with RAGFM to determine their capability as grouped water management scenarios to meet the BMOs.

This section also includes a description of development of a governance structure, dispute resolution, a financing plan, and an implementation schedule for the GWMP.

8.1 POTENTIAL PROJECTS

The following projects are being considered by water retailers and water management agencies, including Valley District and Western, to enhance the use of groundwater from the Riverside Basin to meet future water demands. These projects are presented here for planning purposes to determine if these types of efforts can contribute towards the overall goal of operating the groundwater basin in a sustainable manner for reliable supply for beneficial uses. Details were developed to a level sufficient for modeling the projects, but all information is preliminary in nature from a design standpoint as these are conceptual projects.

8.1.1 PLANNED MULTI-AGENCY PROJECTS AND PROGRAMS

8.1.1.1 Riverside North Aquifer Storage and Recovery Project

RPU, in conjunction with Western and Valley District, has identified a potential joint use for 35 acres of land owned by Riverside, known as the Flume Tract, as a recharge area for replenishment of Riverside North. The proposed Riverside North Aquifer Storage and Recovery Facilities consist of five basins at an anticipated depth of 8 feet below grade, adjacent to and west of the Santa Ana River upstream of the La Cadena Bridge in Colton and downstream of the I-10 bridge. The system will include an 8-foot high inflatable rubber dam and diversion piping in the Santa Ana River to be located near the recharge basins as well as associated appurtenant diversion and conveyance structures.

The availability of local surface water in the Santa Ana River will be highly variable depending on local runoff and could range from a few hundred AFY during dry year conditions to over 200,000 AFY during wet year conditions. Recharge will be limited both by available runoff and maximum capacity of the recharge basins. Recharge behind the rubber dam will be based on a 1,500 cubic feet per second threshold for operation. Enhanced recharge behind the rubber dam is estimated at 10,000 AFY. The recharge basins are estimated to be operational 60 days per year and are anticipated to recharge approximately 3,000 AFY. RPU is conducting additional studies in support of an Environmental Impact Report to further evaluate the implementation of this project.

The implementation of this project will benefit several stakeholders in the Riverside Basin. For RPU, the recharge will help maintain production in the portion of Riverside North where the John W. North Water Treatment Plant's wells are located. For Western and Valley District, this project will facilitate recharge in Riverside North if required due to extractions (Western) or water levels (Valley District).

8.1.2 PLANNED INDIVIDUAL AGENCY PROJECTS AND PROGRAMS

8.1.2.1 Pellissier Ranch – Recycled Water Recharge Basins

One potential option for increasing the amount of groundwater that can be sustainably pumped from the Riverside Basin would be for RPU to recharge the underlying groundwater basin with recycled water. This new recharge would allow for additional production from the basin while maintaining sustainable groundwater supplies. Recycled water recharge would require at least tertiary treatment and disinfection prior to surface application. The capacity and treatment goals for the wastewater treatment facility for recycled water recharge is dependent upon many factors including location, amount of potential dilution (ratio of recycled water to groundwater), and underlying groundwater basin objectives.

If recharge were to be considered in the vicinity of the Santa Ana River, specifically at the Pellissier Ranch property, recharge would occur in the Riverside Basin Groundwater Management Zone A as defined in the Basin Plan. Riverside Basin Groundwater Management Zone A has a TDS objective of 550 mg/L and a nitrate-N objective of 6.2 mg/L. The project will be required to meet the Basin Plan objectives. If recharge were considered in the eastern part of Riverside Basin over Groundwater Management Zones E or F, where the water quality objectives are 720 and 660 mg/L respectively for TDS, and 10 and 9.5 mg/L respectively for nitrate-N, reduction of TDS or nitrogen would not appear to be a governing factor in meeting Basin Plan objectives.

Conceptually, the Pellissier Ranch recharge basins would cover approximately 10 acres and recharge up to 10,000 AFY of diluent and recycled water. Although this project would recharge the underlying Riverside North Basin, RPU would recover this water with wells located in Riverside South. Thus this would be a Riverside South conjunctive use project. The 6-month travel time required by DPH would require verification through modeling as the RPU North Orange wellfield is approximately 4,000 feet south and downgradient of the potential location of the recharge basins.

8.1.2.2 East Side Recycled Water Recharge

The Springbrook Channel in Management Zone F near the eastern margin of the Riverside Basin has been identified as a potential recharge area. The channel is approximately 2 miles in length, is predominantly unlined, contains velocity control structures, and is regulated by the California Department of Fish and Game. Regardless of location, however, some reduction of total organic carbon and nitrate will likely be required to meet the current DPH draft regulations for groundwater recharge in addition to what may be able to be demonstrated for reduction in recharge basins or wetland systems.

8.1.2.3 Additional or Replacement Production Wells

Colton anticipates the construction and completion of Wells 30 and 31 in Riverside North, in accordance with the city's well pumping plants construction and retirement schedule in its master plan. These wells are projected to yield 4,000 GPM of supply water (up to 6,400 AFY) and will be completed by year 2015. The master plan also identifies construction of Wells 32 through 35 at some time in the future, but the actual implementation timeframe is not currently known. For the purposes of this GWMP, only increased production from Wells 30 and 31 was considered.

RPU's Flume 7 Well was constructed in October 2011 and was on-line in early 2012; it provides supplemental water to the John W. North Water Treatment Plant. The well is located approximately 1,200 feet west of the treatment plant near the east bank of the Santa Ana River. Flume 7 Well has a capacity of 2,200 gallons per minute. A small-scale groundwater model was

constructed by Geoscience Support Services, Inc. to evaluate potential well interference to other nearby production wells in the Riverside Basin. The model indicated negligible pumping interference.

In addition to the Flume 7 Well, a replacement well for the DeBerry Well is in the planning stages for RPU. The DeBerry Well is approximately 3,000 feet southwest of the John W. North Water Treatment Plant and the replacement well will be located approximately 50 feet north of the existing well on the same site. It will have an anticipated production capacity of 2,000 gallons per minute.

8.1.3 Simulated Benefits and Impacts of Potential Projects

RAGFM was used to simulate the potential benefits and impacts of different combinations of potential projects within both the Arlington Basin and the Riverside Basin. The simulations compared simulated baseline conditions to conditions with the potential projects to estimate the benefits and impacts. The following sections describe the modeling results for the baseline and three hypothetical modeling scenarios. Table 8.1 summarizes the simulations and the results.

Table 8.1
Simulated Basin Conditions

Flow Components			Simulation							
			Scenario 1		Scenario 2		Scenario 3		Scenario 4	
			Riverside North	Riverside South	Riverside North	Riverside South	Riverside North	Riverside South	Riverside North	Riverside South
BASIN OUTFLOW	**Groundwater Production (AF/yr)**									
		Flume Wells 2-6	8,210		10,000		10,000		8,210	
		Flume Well 7			4,360		4,360		4,360	
		Colton Wells 30 and 31			8,070		8,070		4,035	
		West Valley New Wells					8,630		3,090	
		WMWD Desalter Wells 1-5								
		WMWD New Desalter Wells								
		RIX Extraction**	35,800		35,800		35,800		35,800	
		Pellissier ASR Extraction Wells								10,000
		Other Wells**	20,090	36,330	20,090	36,330	20,090	36,480	20,075	36,310
		Subtotal	**64,100**	**36,330**	**78,320**	**36,330**	**86,950**	**36,480**	**75,570**	**46,310**
	Net Boundary Outflow (AF/yr)									
		Riverside North Basin								
		Riverside South Basin	19,120		18,070		22,820		25,650	
		Arlington Basin								280
		Chino Basin	2,840		2,840		2,840		2,840	
		Temescal Basin & Hole Lake Area								
		Subtotal	**21,960**	**0**	**20,910**	**0**	**25,660**	**0**	**28,490**	**280**
	Santa Aan River Gain (AF/yr)									
		Santa Ana River Gain from Groundwater		**17,890**		**17,560**		**19,560**		**15,850**
	TOTAL OUTFLOW		**86,060**	**54,220**	**99,230**	**53,890**	**112,610**	**56,040**	**104,060**	**62,440**
BASIN INFLOW	**Groundwater Recharge at Recharge Facilities (AF/yr)**									
		ASR On-Channel Facility (in Rialto-Colton Basin)***			10,000		21,920			
		ASR Off-Channel Facility			3,000		8,980		6,000	
		Pellissier ASR Facility							10,000	
		RIX Percolation Basin Feed**	28,100		28,100		28,100		28,100	
		Arlington Basin Recharge Facilities							-	
		Subtotal	**28,100**	**0**	**31,100**	**0**	**37,080**	**0**	**44,100**	**0**
	Natural Groundwater Recharge (AF/yr)									
		Deep Percolation from Precipitation and Applied Water	1,360	3,240	1,350	3,240	1,740	3,240	1,350	3,230
		Natural Recharge at Basin Boundaries and Streambed Recharge	140	3,170	140	3,170	140	3,200	150	3,110
		Subtotal	**1,500**	**6,410**	**1,490**	**6,410**	**1,880**	**6,440**	**1,500**	**6,340**
	Net Boundary Inflow (AF/yr)									
		Rialto-Colton Basin	28,320		38,390		44,810		30,320	
		Riverside North		19,120		18,070		22,820		25,650
		Riverside South								
		Arlington Basin		100		680		230		
		Temescal Basin								
		Subtotal	**28,320**	**19,220**	**38,390**	**18,750**	**44,810**	**23,050**	**30,320**	**25,650**
	Santa Ana River Loss (AF/yr)									
		Santa Ana River Loss to Groundwater	**27,040**	**27,310**	**27,020**	**27,470**	**28,610**	**25,850**	**26,550**	**28,700**
	TOTAL INFLOW		**84,960**	**52,940**	**98,000**	**52,630**	**112,380**	**55,340**	**102,470**	**60,690**
BASIN STORAGE CHANGE	**Long-Term Average Storage Change (AF/yr)* (Storage Change = Inflow - Outflow)**		**-1,100**	**-1,280**	**-1,230**	**-1,260**	**-230**	**-700**	**-1,590**	**-1,750**
LONG-TERM IMPACT ON GROUNDWATER ELEVATIONS	**Long-Term Average Groundwater Head (ft)***									
	1969 Western Judgment Index Wells	Johnson 1 (in Rialto-Colton Basin)	861.2		866.0		889.7		854.6	
		Flume 2	850.9		849.7		880.2		843.3	
		Flume 5	847.5		845.5		873.2		840.4	
		Average of 3 index wells	853.2		853.7		881.0		846.1	
	Riverside North	RA24 (CPC East Side)	850.2		848.5		871.8		842.5	
		RA21 (Twin Butte #6)	829.4		826.8		840.8		819.8	
		RA17 (#8)	833.1		826.7		854.7		820.7	
	Riverside South	RE9 (Mulberry)		755.5		753.1		763.7		745.5
		RC1 (#14, 46th Street)		743.6		743.5		743.8		743.1
		RD3 (Laura Lane)		739.7		743.6		741.6		735.5

Notes:

* - Long-term average is over the 43 years of simulation representing the long-term hydrologic conditions of 1965 to 2007.

** - Based on 2007 groundwater recharge and production data.

***- ASR On-Channel Facility recharge is not included in the water budget calculations of Riverside North Basin as this facility is located in Rialto-Colton Basin. Impact of ASR On-Channel Facility is observed in changes in boundary inflow from Rialto-Colton Basin to Riverside North Basin.

8.1.3.1 Scenario 1: Existing Conditions Baseline

The objective of the Existing Conditions (EC) Baseline simulation is to define the land and water use and hydrologic conditions that will be used as the basis for comparison of model simulations. The EC Baseline represents 2007 production plus approximately 8,000 AFY in Riverside North and minus approximately 2,000 AFY in Riverside South. The assumptions and data used for development of the EC Baseline are presented in *Riverside-Arlington Groundwater Flow Model (RAGFM): Model Development and Scenarios* (WRIME, 2011). The EC Baseline simulates an average change in groundwater storage of -1,100 AFY for Riverside North and -1,280 for Riverside South (see Table 8.1).

8.1.3.2 Scenario 2: Near-Term Future Projects Conditions

The objective of the Near-Term Future Projects Conditions (Scenario 2) is to evaluate the sustainability of selected future groundwater recharge and production projects. The impacts of these projects on groundwater resources were evaluated by comparing the results of Scenario 2 with the EC Baseline results. Scenario 2 represents EC Baseline land use and water demand conditions with the addition of the following selected projects:

- Proposed Riverside North Aquifer Storage and Recovery Facilities, consisting of:
  - Inflatable Dam and In-Channel Recharge Facilities
  - Off-Channel Recharge Facilities
- Increased Production from Flume Wells 2 through 6
- Flume 7 Well in Riverside North
- Proposed Arlington Basin Recharge Facilities
  - Metrolink Basins
  - Monroe Basin
  - Victoria Basin
- Operation of Existing Arlington Desalter Wells at 7,840 AFY

Scenario 2 simulates an average change in storage of -1,230 AFY for Riverside North and -1,260 AFY for Riverside South (see Table 8.1). These values are similar to the EC Baseline with 130 AFY more decline in storage for Riverside North and 20 AFY less decline in storage for Riverside South. The similarity of these results to the EC Baseline shows that the proposed recharge activities are sufficient to balance the increased production, but are not sufficient to bring the basin to a sustainable zero change in storage. Details of the scenario and the results are included in *Riverside-Arlington Groundwater Flow Model (RAGFM), Model Development and Scenarios* (WRIME, 2011).

8.1.3.3 Scenario 3: Long-Term Future Projects Conditions

The objective of Scenario 3 is to estimate the maximum volume of water that can be recharged at the ASR Facilities within certain constraints and evaluate the sustainability of selected future groundwater production projects. The impacts of these projects on groundwater resources were evaluated by comparing the results of Scenario 3 and the EC Baseline. Scenario 3 represents the EC Baseline land use and water demand conditions with the addition of the Scenario 3 projects:

- Proposed Riverside North Aquifer Storage and Recovery Facilities consisting of:
  - Inflatable Dam and In-Channel Recharge Facilities
  - Off-Channel Recharge Facilities
- Flume 7 Well in Riverside North
- Colton Wells 30 and 31
- Proposed West Valley wells at 11,190 AFY
- Proposed Arlington Basin Recharge Facilities
  - Metrolink Basins
  - Monroe Basin
  - Victoria Basin
- Operation of Existing Arlington Desalter Wells
- Proposed New Arlington Desalter Wells

Modeling results for Scenario 3 demonstrate that maximum recharge rates at the ASR Facilities are limited by the available aquifer storage volume in the Riverside North and Colton basins. The available aquifer storage in Riverside North Basin is limited by the high seepage rates from the Santa Ana River during the wet and normal years and the production rates of the groundwater extraction projects.

Scenario 3 simulates an average change in storage of -230 AFY for Riverside North and -700 AFY for Riverside South (see Table 8.1). While still showing an average annual decline in storage, these values show less of a decline in storage than in the EC Baseline, 870 AFY less decline in storage for Riverside North and 580 AFY less decline in storage for Riverside South. Despite the addition of significant new groundwater production at Flume 7, Colton 30 and 31, and West Valley wells, the large volume of new artificial recharge under this scenario results in less decline in storage when compared to the EC Baseline, although there is still an overall decline in storage. Details of the scenario and the results are included in *Riverside-Arlington Groundwater Flow Model (RAGFM), Model Development and Scenarios* (WRIME, 2011).

8.1.3.4 Scenario 4: 2015 Future Projects Conditions

The objective of Scenario 4 is to evaluate the sustainability of 2015 future groundwater recharge and production projects. The intent of Scenario 4 for Riverside North Basin is to evaluate the impact of new production wells with the ASR Facilities operating at lower recharge rates. Additionally, the impact of the Pellissier Ranch ASR Facilities was evaluated. The impacts of these projects on groundwater resources were evaluated by comparing the results of Scenario 4 and the EC Baseline. Scenario 4 represents the EC Baseline land use and water demand conditions with the addition of the Scenario 4 projects:

- Proposed Riverside North Aquifer Storage and Recovery Facilities consisting of Off-Channel Recharge Facilities
- Pellissier Ranch ASR Facilities
- Flume 7 Well in Riverside North
- Colton Well 30
- Proposed West Valley wells operating at 5,650 AFY
  - 3,090 AFY from new wells
  - 1,560 AFY from existing wells
- Proposed Arlington Basin Recharge Facilities
  - Monroe Basin
  - Victoria Basin
- Existing Arlington Desalter Wells
- Proposed New Arlington Desalter Wells
- Reduced Groundwater Production by La Sierra University Wells

Scenario 4 simulates an average change in storage of -1,590 AFY for Riverside North and -1,750 AFY for Riverside South (see Table 8.1). These values show a greater decline in storage compared to the EC Baseline, a 490 AFY greater decline in storage for Riverside North and a 470 AFY greater decline in storage for Riverside South. When compared to the EC Baseline, Scenario 4 shows greater declines in storage as the proposed recharge activities are not sufficient to balance the increases in groundwater production. Additional recharge or more strategically located recharge would be needed to develop a sustainable water management strategy. Details of the scenario and the results are included in *Riverside-Arlington Groundwater Flow Model (RAGFM), Model Development and Scenarios* (WRIME, 2011).

8.1.4 SIMULATIONS COMPARED TO THE 1969 WESTERN JUDGMENT

The 1969 Western Judgment guides groundwater management in the Riverside Basin. The long-term planning in this document was developed to recognize the commitments in the 1969 Western Judgment and to develop a water management strategy for the basin. In this way, a cost-effective means can be established for meeting the requirements of the judgment and for maintaining sustainable groundwater levels. A comparison of the model simulations to the requirements of the 1969 Western Judgment is provided in the sections below.

8.1.4.1 Riverside North

Base Rights for extractions from Riverside North by Riverside County entities for use in Riverside County are 21,085 AFY, as discussed in Section 4.1.1. The EC Baseline and the three scenarios are presented in Table 8.2 for a comparison to historical and projected production and the Base Rights for extraction by Riverside County entities.

Table 8.2
Simulations Compared to Historical and Projected Production, Riverside North (AFY)

	Avg Base Period Extractions	Annual Extractions					Proposed Extractions			Modeled Extractions			
	1959-1963	1971	1980	1990	2000	2009	2015	2020	2025	Baseline	Scenario 2	Scenario 3	Scenario 4
Riverside North Extraction by San Bernardino County Entities for use in San Bernardino County													
Colton	7	59	0	0	1,866	1,522	1,496	1,450	1,495	1,649	9,720	9,720	5,685
West Valley	1,341	1,264	545	448	2,203	917	2,000	2,000	2,500	2,564	2,564	11,193	5,651
Other†	1,878	1,490	678	328	367	1	0	0	0	0	0	0	0
Private‡	6,374	5,935	4,716	7,095	5,000	5,059	5,160	5,160	5,160	5,481	5,507	5,507	5,468
Subtotal	*9,600*	*8,748*	*5,939*	*7,871*	*9,436*	*7,499*	*8,656*	*8,610*	*9,155*	*9,694*	*17,791*	*26,421*	*16,804*
Modeled RIX Groundwater Impact*	0	0	0	0	2,056	372	§	§	§	-105	§	§	§
Riverside North Extraction by Riverside County Entities for use in San Bernardino County													
RPU	754	174	1,587	1,012	0	0	0	0	0	0	0	0	0
Riverside Highland	1,098	1,526	1,447	1,616	1,120	2,408	2,848	2,848	2,848	1,936	1,936	1,936	1,936
Other†	569	32	150	0	0	0	0	0	0	0	0	0	0
Private‡	614	482	218	0	0	0	0	0	0	0	0	0	0
Subtotal	*3,035*	*2,214*	*3,402*	*2,628*	*1,120*	*2,408*	*2,848*	*2,848*	*2,848*	*1,936*	*1,936*	*1,936*	*1,936*
Riverside North Extractions by Riverside County Entities for use in Riverside County													
Empire Water	2,419	2,219	585	0	0	0	see "other"			see "other"			
RPU	10,903	4,930	2,143	11,933	10,293	15,215	12,000	17,000	17,000	15,649	21,772	21,772	20,008
Riverside Highland	2,654	3,778	2,837	1,242	18	298	352	352	352	239	239	239	239
Other†	4,153	6,832	3,627	2,696	1,058	1,031	940	940	940	782	782	782	782
Private‡	956	349	0	0	0	0	0	0	0	0	0	0	0
Subtotal	*21,085*	*18,108*	*9,192*	*15,871*	*11,369*	*16,544*	*13,292*	*18,292*	*18,292*	*16,670*	*22,793*	*22,793*	*21,030*
TOTAL RIVERSIDE NORTH BASIN	**33,720**	**29,070**	**18,533**	**26,370**	**21,925**	**26,451**	**24,796**	**29,750**	**30,295**	**28,300**	**42,520**	**51,150**	**39,770**
ASR Recharge							3,500	3,500	3,500		13,000	30,900	6,000

All values are presented in acre-feet

* Modeled RIX impact based on WRIME, 2011 and accounts for percolation basin feed, production, SAR recharge, and subsurface flows. For 2009, which was not modeled by in WRIME, 2011, an average value was used based on 1996-2007 values.

† Other includes: La Sierra Water Company, Temescal Water Company, West Riverside 350" Water Company, and the small portion of West Valley that is in Riverside County.

‡ Private includes: Agua Mansa Properties; Aguinaga, Roger; Allee Ranch; American Cement Company; Asphalt Recycling; Bradford, Ivan; Bradvica, Louis; California Portland Cement Company; Corridor Land Company; Country Club Storage; El Rivino Country Club; Firestone Group Ltd; Fisher, Charlotte; General American Transportation Corp (GATX); Green Acres Memorial Park Ass'n; Hamada Bros; Holliday Trucking; Holter Ranch; Howell, Orus; Kleckler, Don; Madison, Erin; Mason; McDaniel & Son Dairy; Milestone Ranch; Rancho De Santa Fe; RIX - pre-facility agricultural production; Roquet, Harry V.; Service Rock Co; Villelli Enterprises; Vulcan - Cal Mat; Woodland Farms.

Pumping from private wells varies slightly between simulations due to changes made to avoid dry model cells.

§ Net RIX impact projections are not available and net RIX impacts were not estimated for Scenarios 2-4

Sources: Riverside North production data for agencies (except Colton and the portion of West Valley that is not part of the former Inter County Water Company) and for Riverside Cement Company (included in Private), data are from the Watermaster 2008 Annual Report, Volume 3, Table 4. For the remaining private pumpers, Colton, West Valley (non-Inter County) and Other, data is from the database tied to the annual reports (Western-San Bernardino Watermaster, 2010a). All private pumping (except the above mentioned Riverside Cement) is assumed to be used within San Bernardino County. Projected Riverside North other pumping is assumed to be used in Riverside County. Projected Riverside North private pumping is assumed to be used in San Bernardino County.

Riverside Highland production includes leased water to RPU

1971 West Valley production includes 6610 James Sullivan and 7418 James Sullivan wells, which are outside the Bulletin 118-03 but inside the 1969 Judgment Boundary

1980 RPU Production in Riverside North for Use in San Bernardino County includes 95 AF from a well leased from Dr. Mason to supply the Jurupa Ditch and a correction of 8 AF from Table 4 (Steve Mains, pers comm 9/24/10)

1980 Other production includes James Sullivan MWC Well, which is outside of the Riverside-Arlington Basin as defined by DWR Bulletin 118-03 but inside the 1969 Judgment Boundary

2000 Riverside Highlands annual extraction from Riverside South includes 1,087 AF reassigned from Riverside North

2007 Riverside Highlands annual extraction from Riverside South includes 63 AF reassigned from Riverside North

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The simulated scenarios contain productions by Riverside County entities for use in Riverside County that is within or slightly above the Base Rights of 21,085, as shown in Table 8.3. For Scenarios 2, 3, and 4, a new artificial component is proposed that will result in additional credits for Western under the 1969 Western Judgment. This recharge also assists in providing a sustainable basin with regards to meeting the 1969 Western Judgment's groundwater elevation requirements.

Table 8.3
Simulated Riverside North Groundwater Production by Riverside County Entities for Use in Riverside County Compared to Base Rights (AFY)

Scenario	Base Rights (a)	Production (b)	New Artificial Recharge (c)	Difference (a) – (b) + (c)
EC Baseline	21,085	16,670	0	4,415
Scenario 2	21,085	22,793	13,000	11,292
Scenario 3	21,085	22,793	30,900	29,192
Scenario 4	21,085	21,030	6,000	6,055

The simulated pumping results in a decline in storage although the production requirements of the 1969 Western Judgment will be met. The other major component of the 1969 Western Judgment that provides protection to long-term groundwater supplies is the maintenance of a minimum elevation of 822.04 feet at the index wells. Modeling simulations show that the minimum elevation threshold will be violated for the EC Baseline and Scenarios 2 and 4, as shown in Figure 8.1. This violation occurs during simulation of the scenarios under hydrologic conditions equivalent to the later part of the drought period 1970 through 1977.

The violation did not actually occur in the period 1970 through 1977. It appears that the simulations result in violations because of changes in simulated groundwater production and discharge of City of San Bernardino and Colton wastewater. Simulated pumping during the 8-year period is 6,000 AFY greater than the actual pumping during that time period. It appears that the increase in pumping results from increased extractions by users within Valley District.

Wastewater from San Bernardino and Colton was discharged to the river near Bunker Hill Dike during the actual period 1970 through 1977. Such wastewater was excluded from simulations because the point of discharge was relocated downstream of the index wells to RIX in 1995. The average loss of perculation associated with the relocation is about 11,000 AFY. This loss coupled

with the 6,000 AFY of increased pumping results in a net average decrease in storage of about 17,000 AFY which could be a significant factor in causing the violations. Future work may be necessary to determine the magnitude, location, and timing of the recharge activities required to avoid this condition.

The 1969 Western Judgment provides that during periods when this condition exists, plaintiffs may transfer pumping from the Riverside Basin to the SBBA; Valley District will be responsible for replenishment in the SBBA if there are not sufficient credits available to offset such increase in pumping. This method of dealing with violations may be more cost effective than trying to increase recharge. Scenario 3 does not result in violations, but it requires an addition 15,000 AFY of recharge and results in an increase in lost rising groundwater at Riverside Narrows of 2,000 AFY.

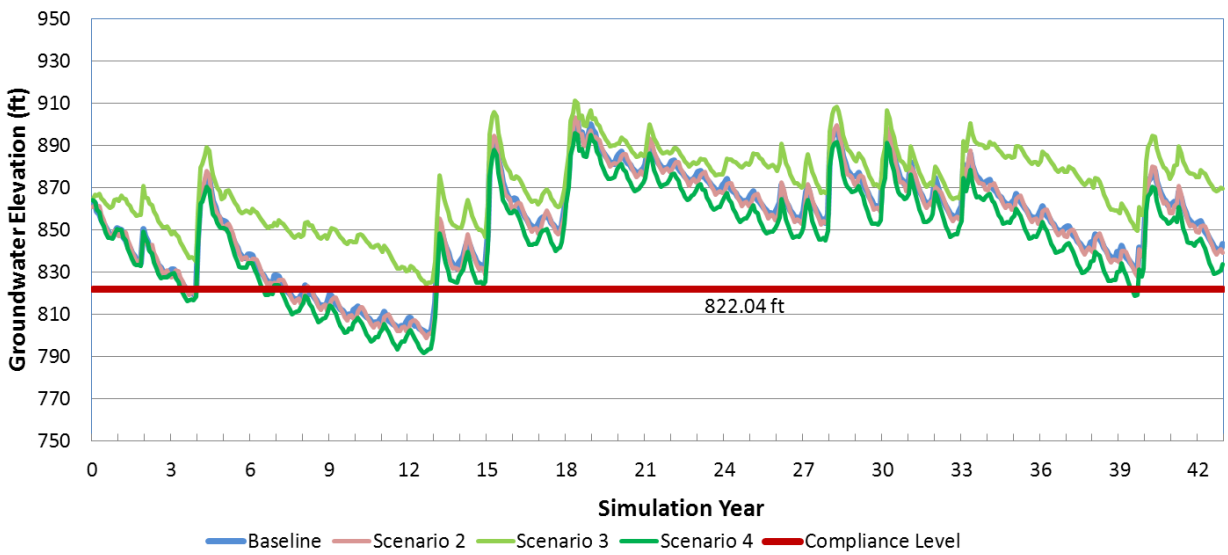

Figure 8.1
Average Simulated Groundwater Elevations for 1969 Western Judgment Index Wells (Flume 2, Flume 5, and Johnson 1)

8.1.4.2 Riverside South

Base Rights for extractions from Riverside South are 29,633 AFY, as discussed in Section 4.1.2 . The EC Baseline and the three scenarios are presented with historical and projected production in Table 8.4 for a comparison to Base Rights.

Table 8.4
Simulations Compared to Historical and Projected Production, Riverside South (AFY)

	Avg Base Period Extractions	Annual Extractions					Proposed Extractions			Modeled Extractions			
	1959-1963	1971	1980	1990	2000	2009	2015	2020	2025	Baseline	Scenario 2	Scenario 3	Scenario 4
Empire Water	0	0	0	0	0	533	see "other"			see "other"			
Jurupa	1,137	814	3	310	26	581	600	600	600	289	289	289	289
RPU	16,879	15,643	20,575	19,977	22,177	26,456	20,074	20,274	24,674	28,068	28,068	28,068	38,068
Riverside Highland	554	2,098	1,000	1,546	1,174	0	1,000	1,000	1,000	22	22	22	22
Rubidoux	1,181	3,639	3,039	5,554	6,627	6,609	9,820	10,520	10,600	6,704	6,704	6,704	6,704
Other†	3,245	2,415	1,356	511	876	458	940	940	940	548	548	548	548
Private‡	6,635	5,999	3,944	3,459	2,108	640	830	830	830	699	699	849	679
TOTAL RIVERSIDE SOUTH BASIN	**29,631**	**30,608**	**29,917**	**31,357**	**32,988**	**35,277**	**33,264**	**34,164**	**38,644**	**36,330**	**36,330**	**36,480**	**46,310**
Pellissier Ranch Recharge								10,000	10,000				10,000
Modeled RIX Groundwater Impact*	0	0	0	0	-700	-704	§	§	§	-1,074	§	§	§

All values are presented in acre-feet

* Modeled RIX impact based on WRIME, 2011 and accounts for percolation basin feed, production, SAR recharge, and subsurface flows. For 2009, which was not modeled by in WRIME, 2011, an average value was used based on 1996-2007 values.

† Other includes: Alamo Water Company, Box Springs Mutual Water, Crestmore Heights Mutual Water, Eastern Municipal Water District, Riverside County Parks Department, Riverside County Flood Control and Water Conservation District, Riverside Unified School District, Rivino Water Company

‡ Private includes: Agua Mansa Properties; Bank Of America N.T.&S.A.; Burns, F.L. & Laura; California Baptist University; California Dept of Transportation Dist 8R; Canyon Crest Country Club; Carpenter Company; Citizens National Company; Gross, Dale P.; Grubbs, V. W.; Hunter Engineering Company; Indian Hills Water Conservation; Johnson, Truman; La Casa Contenta Motel; Loring Ranch 31503 LP; Madison, Erin; Martin Linen (Tri-City Linen Supply Co); Martin, Kenneth Allan; Mastercraft Homes; Michael, C.; Mipo Corp, dba Mission; Property Acquisition Company; Riverside Cement Company; Riverside Industrial Park; Riverside Thoroughbred Farm; Rocky R Ranch; Roos, Charles E.; Ross, Sam; Schwab, A. M.; Scope Corporation; Stoker, George; Taylor, Walter & Barbara; Universal Forest Products; University of California, Regents; Victoria Country Club; Von Kanel, Alfred; Waterman, Allen H; White Sulphur Springs Pool; Wight, Charles H; Zike, Vera.

Pumping from private wells varies slightly between simulations due to changes made to avoid dry model cells.

§ Net RIX impact projections are not available and net RIX impacts were not estimated for Scenarios 2-4

Riverside South production data is from the database tied to the annual reports (Western-San Bernardino Watermaster, 2010a).

Riverside Highland production includes leased water to RPU

2000 Riverside Highlands annual extraction from Riverside South includes 1,087 AF reassigned from Riverside North

2007 Riverside Highlands annual extraction from Riverside South includes 63 AF reassigned from Riverside North

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The scenarios contain productions that exceed the Base Rights of 29,633, as shown in Table 8.5. However, the recharge component of the scenarios will result in additional credits for Western under the 1969 Western Judgment.

Table 8.5
Simulated Riverside South Groundwater Production Compared to Base Rights (AFY)

Scenario	Base Rights (a)	Production (b)	New Artificial Recharge (c)	Difference (a) – (b) + (c)
EC Baseline	29,633	36,330	0	-6,697
Scenario 2	29,633	36,330	0	-6,697
Scenario 3	29,633	36,480	0	-6,847
Scenario 4	29,633	46,310	10,000	-6,677

The simulated pumping results in a decline in storage although the requirements of the 1969 Western Judgment will be met. This is largely due to the location of recharge activities in Riverside North and Rialto-Colton, to the north of Riverside South. The increases in production in Riverside South are only partially balanced by the recharge farther to the north. To maintain a sustainable groundwater supply under current demands and to meet anticipated increased future demands, recharge projects such as those simulated will be necessary. Additional consideration should be given to the placement of recharge basins and whether there would be benefits from placing recharge activities within or closer to Riverside South. Advanced planning is necessary to get the projects in place and to take advantage of years with excess available water for the recharge projects.

8.1.5 ADDITIONAL MODELING / RAGFM ENHANCEMENTS

RAGFM is an important tool for groundwater management in the Riverside and Arlington basins. The scenarios described above were modeled prior to the release of the 2010 UWMPs. Although the production and recharge contained in the modeled scenarios are similar to data presented in the 2010 UWMPs, there are differences as shown in Table 8.2 and Table 8.4. Future model runs should include the updated proposed extractions and various scenarios that maintain or slightly increase groundwater in storage. Future modeling also should develop a range of scenarios that if implemented would operate the Riverside Basin in a sustainable manner.

Two enhancements to the RAGFM should be considered in the future. First, would be the addition of a groundwater quality component to the existing RAGFM to assist in the management of non-point source and point source contaminants. This includes improved TDS and nitrates management and an improved ability to quantify impacts of water supply projects on regional contaminant plumes and on regional ambient groundwater quality. Second, would be to incorporate RAGFM into a larger regional model, which could combine the flow models for the SBBA, Rialto-Colton, and Chino basins. Such a groundwater model would assist in improving the representation of flow between the basins and would assist in understanding regional flow conditions and their impacts on contaminant plumes, TDS and nitrates concentrations, and other regional issues.

8.2 GOVERNANCE

The governance of the Riverside Basin will be determined through discussions amongst the stakeholders. Currently, the basin's governance is based on the individual interest model. Under the individual interest model, stakeholders govern and develop water resource projects individually. However, development of individual projects will be done following the common goal, objectives, and elements described in this GWMP. Additionally, coordination between stakeholders will facilitate easier implementation of projects spanning all or a portion of the basin.

Subsequent to adoption of the GWMP, meetings will be hosted by RPU in which representatives from each stakeholder group can get together to discuss and seek to resolve regional groundwater issues. At these meetings, agreements can be made if multiple groups choose to contribute to the development of regional projects outlined in the GWMP; however, the ultimate project-making authority remains within the entity sponsoring the project. Financing is also the responsibility of the sponsoring agency or group. The individual groups can enter into agreements to guide subsequent actions and provide funding. Voting at the meetings will be limited to those that will have adopted or agreed to the GWMP, although other stakeholders will be encouraged to attend and participate in discussions in a non-voting role.

The following are advantages to the individual interest approach:

- Agencies can focus their resources on projects specific to their needs
- There is no loss of management control of individual groundwater resources
- It is easiest to implement because it is a continuation of the current approach to groundwater management in the region

A MOU is needed to formalize an individual interest model. This is anticipated to be signed by the water agencies following adoption of the GWMP.

The need for more cohesive management may lead to a mutual-interest model based on a MOU or JPA. The mutual interest model would:

- Ease pursuing regional projects benefitting the entire Riverside Basin
- Define who coordinates projects and what role each agency plays during regional project planning, construction, operation, and maintenance
- Generate economies of scale for large projects
- Increase the likelihood of state funding for projects benefiting multiple entities
- Prevent individual stakeholders from undertaking actions that are not complementary to the BMOs
- Expand the framework to resolve conflicts among individuals

A series of meetings will be held by RPU with stakeholders to define the appropriate governance structure, prepare and execute the MOU or JPA, and begin governance activities.

8.3 DISPUTE RESOLUTION

Disputes relating to the implementation of the GWMP will be resolved by the Advisory Committee. In the event that the Advisory Committee cannot resolve the dispute, an outside neutral third party will assist the parties in working towards a satisfactory resolution, with completion of all procedures within 60 to 90 days, unless the parties to the dispute agree to a longer timeframe. Costs incurred, if any, in this process will be equally shared by the involved parties.

8.4 FINANCING

As discussed above, financing for individual projects will come from the project proponent, and other beneficiaries if agreements are made. Financing for reporting and updating the GWMP will be shared among the plan participants. It is anticipated that RPU will, at their discretion, provide for the development of biennial reports for the entire Riverside Basin, with support from the plan participants for data and review.

8.5 SCHEDULE

The following is an implementation schedule of this GWMP:

Item	*Initial Completion*	*Recurrence*
Meet with stakeholders to define and adopt a governance structure	*1 year*	*n/a*
Develop recharge facilities to increase yield	*3 years*	*As needed*
Develop groundwater quality model	*4 years*	*As needed*
Expand recycled water system	*5 years*	*As needed*
Conduct Groundwater monitoring	*Ongoing*	*Ongoing*
Fill data gaps in water quality network	*2 years*	*As needed*
Complete subsidence analysis using InSAR	*3 years*	*As needed*
Continue public outreach and education	*2 years*	*Ongoing*
Report on GWMP	*3 years*	*2 years*
Update GWMP	*5 year*	*5 years*

9 CONCLUSIONS

The goal of the Riverside Basin Groundwater Management Plan is to provide a planning framework to operate and manage the groundwater basin in a sustainable manner to ensure a long-term reliable supply for beneficial uses among all stakeholders in the basin. This goal was developed by the stakeholders in the Riverside Basin as they recognize the importance of groundwater as a reliable and low-cost component of the overall water supply. The Riverside Basin is shared by multiple users, including private producers and retail water agencies. As a shared resource, planning is necessary to ensure the overall basin goal is met. The Basin Management Objectives and the supporting Elements are intended to move the basin towards meeting the overall goal through stakeholder cooperation.

The GWMP is designed to support the existing management framework of the 1969 Western Judgment. This plan cannot and does not impact the 1969 Western Judgment. Implementation of the plan is intended to meet the basin goal and objectives and to assist in meeting the overall sustainability goal.

The following summarize existing and projected production in both Riverside North and Riverside South.

In Riverside North:

- 2009 production by Riverside County entities for use in Riverside County is within Base Rights.
- Projected 2030 production by Riverside County entities for use in Riverside County is within Base Rights.

In Riverside South:

- 2009 production exceeds Base Rights
- Projected 2030 production exceeds Base Rights

The amount of credit currently available to offset future excess extractions in Riverside South is approximately 457,380 AF. Such credit is forecast to be about the same by 2030 because under extractions in Riverside North and Colton Basin will about offset excess extractions in Riverside South.

Recharge of high quality storm water and conserved water through projects such as the Riverside North ASR Project and the Pellissier Ranch ASR can substantially improve the quality of water in the Riverside Basin. This would enable domestic water purveyors to produce increased amounts of poorer quality water that would otherwise become a part of the rising water that is lost to the lower watershed at the Riverside Narrows. These projects can also be useful in mitigating adverse effects of any changes in the current pumping pattern relative to

the historical pattern existing during the Base Period. Such projects would be developed by the retail water agencies working in partnership with Western and Valley District, with no anticipated requirements for private groundwater producers that extract water for beneficial overlying uses. Cooperative development of such projects can be a cost effective method for improving water quality and for meeting basin goals and objectives.

The successful implementation of this GWMP requires full engagement and participation by the stakeholders in the basin. Recognition of shared values and shared concerns can allow for common goals to be met through the management framework presented in this document.

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APPENDIX A – RESOLUTIONS AND PUBLIC HEARING ADVERTISEMENTS

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PUBLIC NOTICES

Riverside Public Utilities Notice of Public Hearing Groundwater Management Plan

NOTICE IS HEREBY GIVEN that at 8:30 a.m. on November 21, 2008 at the Public Utilities Board Room, 3901 Orange Street (Orange and Ninth Streets), Riverside, California 92501, Riverside Public Utilities (RPU) will hold a public hearing on whether or not to adopt a resolution of intention to draft a groundwater management plan for the Riverside Groundwater Basin pursuant to California Water Code section 10750 et seq. for the purposes of implementing the plan and establishing a groundwater management program.

Members of the public, including landowners within the RPU service area and the Riverside groundwater basin, and any other interested parties, are invited to attend the hearing. Draft copies of the proposed resolution of intention to draft a groundwater management plan will be available for review by the public at the hearing or may be obtained in advance of the hearing at the RPU offices at 3901 Orange Street, Riverside, California 92501. Opportunity for public comment and input will be provided at the hearing. In accordance with Water Code section 10753.4(b), interested parties who wish to participate in developing the groundwater management plan may do so by attending the hearing and indicating their interest, or by submitting a written request to participate, to the attention of Tom Field, Riverside Public Utilities, 3901 Orange Street, Riverside, California 92501.

The City of Riverside wishes to make all of its public meetings accessible to the public. Upon request, the proposed resolution of intent document will be made available in appropriate formats to persons with disabilities, as required by Section 202 of the Americans with Disabilities Act of 1990. Any person with a disability who requires a modification or accommodation in order to participate in a meeting should direct such request to the City's ADA Coordinator at (951) 826-5427 or TDD at (951) 826-5439 at least 72 hours before the meeting, if possible.

The public is invited to attend and comment in the process described above. Written comments may also be submitted to Riverside Public Utilities for inclusion in the public record. Any person unable to attend the public hearing may submit written comments to Riverside Public Utilities, 3901 Orange Street, Riverside, California 92501. If you have questions regarding this notice or the matter to be heard, please contact Tom Field at (951) 826-5766. In addition, a website has been established as an information source throughout the development process of the groundwater management plan at www.riversideplan.com

11/5,12

PUBLIC NOTICES

Riverside Public Utilities Notice of Public Hearing Groundwater Management Plan

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Members of the public, including landowners within the RPU service area and the Riverside groundwater basin, and any other interested parties, are invited to attend the hearing. Draft copies of the proposed resolution of intention to draft a groundwater management plan will be available for review by the public at the hearing or may be obtained in advance of the hearing at the RPU offices at 3901 Orange Street, Riverside, California 92501. Opportunity for public comment and input will be provided at the hearing. In accordance with Water Code section 10753.4(b), interested parties who wish to participate in developing the groundwater management plan may do so by attending the hearing and indicating their interest, or by submitting a written request to participate, to the attention of Tom Field, Riverside Public Utilities, 3901 Orange Street, Riverside, California 92501.

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11/5,12

CITY OF RIVERSIDE

BOARD OF PUBLIC UTILITIES

Minutes of:	Regular Meeting of the Board of Public Utilities
Date of Meeting:	November 21, 2008
Time of Meeting:	8:30 a.m.
Place of Meeting:	Public Utilities Boardroom 3901 Orange Street (at Ninth & Orange Streets) Riverside, California

PLEDGE OF ALLEGIANCE TO THE FLAG WAS GIVEN

Roll Call

Present:	Bob Stockton (Vice-Chair)	Mary Curtin
	Ken Sutter	Bernie Titus
	Robert Elliott	Ian Davidson

Absent: Dave Barnhart (absence due to other)
Manny Sanchez (absence due to business)
Joe Tavaglione (absence due to business)

PUBLIC HEARING

Vice-Chairman Stockton announced that the Board of Public Utilities was holding a public hearing regarding the City of Riverside's intent to draft a Groundwater Management Plan for the Riverside Basin in accordance with the requirements of Water Code sections 10750 et. seq." Mr. Stockton instructed that comments of any individual would be limited to three minutes and would be heard in order of sign up. Staff presented a summary of the issue.

Close Public Hearing
There were no public comments regarding this matter, so the Board of Public Utilities closed the public hearing.

Motion – Sutter. Second – Curtin.

Ayes: Stockton, Curtin, Sutter, Titus, Elliott, and Davidson.

Noes: None.

Abstain: None.

Absent: Dave Barnhart (absence due to other)
Manny Sanchez (absence due to business)
Joe Tavaglione (absence due to business)

1. NOTICE OF INTENT TO ADOPT A GROUNDWATER MANAGEMENT PLAN FOR THE RIVERSIDE BASIN

Following discussion, the Board of Public Utilities:

1. Conducted the initial public hearing regarding the City of Riverside's intent to draft a groundwater management plan (GWMP) for the Riverside Basin in accordance with the requirements of Water Code sections 10750 et. seq. (AB3030) and to receive public comment regarding the intention to draft the GWMP; and

2. Recommended that the City Council adopt a resolution of intention to draft the GWMP for the Riverside Basin.

Motion – Davidson. Second – Sutter.

Ayes: Stockton, Curtin, Sutter, Titus, Elliott, and Davidson.

Noes: None.

Abstain: None.

Absent: Dave Barnhart (absence due to other)
Manny Sanchez (absence due to business)
Joe Tavaglione (absence due to business)

MINUTES

2. The approval of the regular meeting minutes from the Board of Public Utilities meeting held on November 7, 2008 were approved as submitted.

Motion – Titus. Second – Curtin.

Ayes: Stockton, Curtin, Sutter, Titus, Elliott, and Davidson.

Noes: None.

Abstain: None.

Absent: Dave Barnhart (absence due to other)
Manny Sanchez (absence due to business)
Joe Tavaglione (absence due to business)

CITIZENS PARTICIPATION

No comments.

COMMITTEE REPORTS

3. "SPECIAL" FINANCE/MARKETING COMMITTEE REPORT
The Board of Public Utilities accepted and filed the November 7, 2008 "Special" Finance/Marketing Committee Minutes.

4. PROPERTY COMMITTEE REPORT - The Property Committee meeting scheduled on November 7, 2008 was cancelled.

5. ELECTRIC COMMITTEE REPORT - The Electric Committee meeting scheduled on November 12, 2008 was cancelled.

CONSENT CALENDAR – (Items 6 to 9)

A motion was made to approve the following items on the Consent Calendar:

Motion – Elliott. Second – Curtin.

Ayes: Stockton, Curtin, Sutter, Titus, Elliott, and Davidson.

Noes: None.

Abstain: None.

Absent: Dave Barnhart (absence due to other)
Manny Sanchez (absence due to business)
Joe Tavaglione (absence due to business)

Electric Items

Water Items

6. PURCHASE OF REPLACEMENT OF TWO 5-YARD DUMP TRUCKS FOR WATER FIELD OPERATIONS

The Board of Public Utilities approved the expenditure of $120,000 to replace two 5-yard dump trucks –Vehicle Numbers S112 and S119.

7. INCREASE WORK ORDER AMOUNT FOR CONSTRUCTION OF SAN BERNARDINO WATER TRANSMISSION MAIN REPLACEMENT PROJECT (I-215 BORE & JACK SEGMENT)

The Board of Public Utilities:

1. Authorized an increase of $152,000 in Work Order No. 0802843 for the construction of the I-215 Bore & Jack Segment of the San Bernardino Transmission Main Replacement Project;
2. Authorized an increase in the change order authority for Purchase Order No. 084549 with Murrieta Development Company, Inc., in the amount of $86,464, for additional costs associated with pipe storage and pipe maintenance, as well as increased costs in prevailing wages and fuel rates; and
3. Authorized an increase in change order authority to the Professional Services Agreement with Tetra Tech, Inc., for additional survey work, if needed, in the amount of $16,500.

8. CONSTRUCTION OF WATER MAIN REPLACEMENT PROJECT ON CHADBOURNE AVENUE (BETWEEN ARLINGTON AVENUE AND STOVER AVENUE)

The Board of Public Utilities approved the revised capital expenditure of $220,000 for Work Order 800401, which includes all design, materials and construction costs for the Chadbourne Avenue Water Main Replacement Project.

9. CONSTRUCTION OF WATER MAIN REPLACEMENT PROJECT ON SHAMROCK AVENUE (BETWEEN FAIRMOUNT BOULEVARD AND MAIN STREET)

The Board of Public Utilities approved the capital expenditure in the amount of $240,000 for Work Order 0501567, which includes all design and construction costs for the Shamrock Avenue Water Main Replacement Project.

Other Items

DISCUSSION CALENDAR

10. APPROVAL OF WORK ORDERS TO EXTEND THE FIBER OPTIC CABLE NETWORK TO SEVEN CITY PARKS

Following discussion, the Board of Public Utilities approved the estimated capital expenditure of $615,405 to extend fiber optic cable to the following city parks: Villegas Park, La Sierra Park, Bordwell Park, Hunt Park, Arlington Park, Reid Park, and Bobby Bonds Park.

Motion – Titus. Second – Davidson.

Ayes: Stockton, Curtin, Sutter, Titus, Elliott, and Davidson.

Noes: None.

Abstain: None.

Absent: Dave Barnhart (absence due to other)
Manny Sanchez (absence due to business)
Joe Tavaglione (absence due to business)

11. DETAILED POLE INSPECTION PHASE 2

Following discussion, the Board of Public Utilities approved the estimated Maintenance expenditure of $600,000 for Work Order No. 0905309.

Motion – Curtin. Second – Davidson.

Ayes: Stockton, Curtin, Sutter, Titus, Elliott, and Davidson.

Noes: None.

Abstain: None.

Absent: Dave Barnhart (absence due to other)
Manny Sanchez (absence due to business)
Joe Tavaglione (absence due to business)

12. CONSTRUCTION OF THE CENTRAL AVENUE WATER MAIN REPLACEMENT AND RECYCLED WATER PIPELINE PROJECT – PHASE II (600 FEET EASTERLY OF VICTORIA AVENUE TO CHICAGO AVENUE)

Following discussion, the Board of Public Utilities approved the capital expenditure in the amount of $1,800,000 for Work Order 0902689, which includes all design, construction, change order contingencies, system connections, service tie-overs, construction management, inspection and geotechnical testing for the Central Avenue Water Main Replacement and Recycled Water Pipeline Project – Phase II (600 feet easterly of Victoria Avenue to Chicago Avenue).

Motion – Curtin. Second – Elliott

Ayes: Stockton, Curtin, Sutter, Elliott, and Davidson.

Noes: None.

Abstain: Titus (conflict of interest)

Absent: Dave Barnhart (absence due to other)
Manny Sanchez (absence due to business)
Joe Tavaglione (absence due to business)

13. ADOPTION OF 2008 POWER SUPPLY INTEGRATED RESOURCE PLAN

The Board of Public Utilities requested that the recommendation be revised to add **"conceptually approve and adopt"**....since the plan was in draft form.

Following discussion, the Board of Public Utilities **conceptually approved and** adopted the proposed 2008 Power Supply Integrated Resource Plan ("IRP").

Motion – Sutter. Second – Elliott.

Ayes: Stockton, Curtin, Sutter, Titus, Elliott, and Davidson.

Noes: None.

Abstain: None.

Absent: Dave Barnhart (absence due to other)
Manny Sanchez (absence due to business)
Joe Tavaglione (absence due to business)

14. ADDITIONAL UNIT CONTINGENT POWER PURCHASE AGREEMENT II BETWEEN SHOSHONE RENAISSANCE LLC, AND CITY OF RIVERSIDE

Following discussion, the Board of Public Utilities recommended that the City Council:

1. Approve the proposed Unit Contingent Power Purchase Agreement II (Agreement) between Shoshone Renaissance LLC (Shoshone Renaissance) and the City of Riverside (City) for geothermal power recognized as a certified renewable energy resource, in substantially the same form as the original agreement approved by the City Council on June 17, 2008, with the exception of pricing and delivery date changes as discussed below;

2. Authorize the City Manager, or his designee to extend the Start Up Deadline specified in the Agreement, if necessary;

3. Authorize the City Manager, or his designee, to provide notice of termination under the terms of the Agreement if Shoshone Renaissance breaches a material term of the Agreement; and

4. Authorize the Public Utilities General Manager, or his designee, to attest to the California Energy Commission compliance filing required pursuant to Chapter 11, Section 2909 of the Commission's Regulations, certifying the Agreement's compliance with California's Greenhouse Gas Emission Performance Standard.

Motion – Titus. Second – Elliott.

Ayes: Stockton, Curtin, Sutter, Titus, Elliott, and Davidson.

Noes: None.

Abstain: None.

Absent: Dave Barnhart (absence due to other)
Manny Sanchez (absence due to business)
Joe Tavaglione (absence due to business)

15. ITEMS FOR FUTURE BOARD OF PUBLIC UTILITIES CONSIDERATION AS REQUESTED BY A MEMBER OF THE BOARD OF PUBLIC UTILITIES

None.

GENERAL MANAGER'S REPORT

16. Update on the status of Riverside Energy Center Units 3&4, including permitting by the California Energy Commission

17. State and Federal Legislative Update

18. Electric / Water Contract Panel Update - November 2008

19. Monthly Benchmark Report Cards - October 2008

20. Open and Closed Work Orders - October 2008

21. Water Highlights - October 2008

22. City Council Agendas - November 4, 2008 and November 11, 2008

23. Upcoming Meetings

24. Systematic Reporting on Conferences/Seminars

25. Electric / Water Utility Acronyms

UPCOMING MEETING

Vice-Chairman Bob Stockton adjourned the meeting at 10:10 a.m. to the next regularly scheduled meeting of the Board of Public Utilities to be held on **Friday, December 5, 2008** at **8:30** a.m. in the Public Utilities Boardroom located at 3901 Orange Street in Riverside, California.

By: David H. Wright

David H. Wright, Secretary
Board of Public Utilities

Approved by: City of Riverside Board of Public Utilities

Dated: December 5, 2008

vacancy in the annual recruitment and appointment process; and (3) requested the Mayor to send a letter thanking Ms. Valdez Yeager for the time she spent on the Human Relations Commission.

GRANT APPLICATION - COMPRESSED NATURAL GAS VEHICLE MAINTENANCE FACILITY PROJECT - 8095 LINCOLN
The City Council (1) ratified approval to submit a grant application with California Department of Transportation for $1,500,000 for the Compressed Natural Gas Vehicle Maintenance Facility project located at 8095 Lincoln Avenue; (2) authorized the City Manager, or his designee, to execute all necessary documents to implement approval of the grant application; (3) upon grant award, authorized an increase in estimated revenue in the amount of $1,500,000 to an interest-bearing revenue account as assigned by the Finance Division; and (4) upon grant award, increased appropriations in the amount of $1,500,000 to the CNG Vehicle Maintenance Facility Project Account as assigned by the Finance Division.

GRANT APPLICATION - PROVIDING EMPLOYMENT, EDUCATION, RESOURCES AND SERVICES PROGRAM OPERATION
The City Council (1) concurred with staff's submittal of a grant application with Employment Development Department for $486,480 in Workforce Investment Act grant funds with an in-kind match from existing resources in the amount of $730,626 to operate a Providing Employment, Education, Resources and Services (PEERS) Program for gang involved or at risk youth; (2) authorized the City Manager or his designee, on behalf of the City, to make any non-substantive changes in documents necessary to execute all contracts; and (3) directed staff to return to the City Council for authority to accept the grant award and appropriate funds upon notification of the grant award.

GROUNDWATER MANAGEMENT PLAN - RIVERSIDE GROUNDWATER BASIN - RESOLUTION
The City Council adopted a resolution of intent to draft a Groundwater Management Plan for the Riverside Groundwater Basin; whereupon, the title having been read and further reading waived, Resolution No. 21767 of the City Council of the City of Riverside, California, of Intent to Draft a Groundwater Management Plan for the Riverside Groundwater Basin, was presented and adopted.

AGREEMENTS - CITYWIDE PARKWAY AND MEDIAN LANDSCAPE AND IRRIGATION MAINTENANCE
The City Council (1) awarded agreements with Soholt and Company

Landscape for $265,734, Valleycrest Landscape Maintenance, Inc., for $524,160, Merchants Landscape Services, Inc., for $639,000, and Mariposa Horticultural Enterprises, Inc., for $1,187,730 for Citywide parkway and median landscape and irrigation maintenance through June 30, 2010; and (2) authorized the City Manager, or his designee, to approve future amendments to the agreements subject to availability of budgeted funds.

AGREEMENT - DOWNTOWN RIVERSIDE TROLLEY FARES SUBSIDY - FUNDS TRANSFER
The City Council (1) approved an agreement with Riverside Transit Agency (RTA) for $135,000 to subsidize Downtown Riverside Trolley fares for Route 52; (2) authorized the City Manager, or his designee, to execute the agreement to maintain fares at the levels directed in the agreement; and (3) authorized a funds transfer in the amount of $75,000 from Unprogrammed Air Quality Improvement Fund 240 Account 4140100-453001 to Air Quality Professional Services Account 4140100-421041.

MAYOR/COUNCILMEMBER COMMUNICATIONS

LEGISLATIVE REPORT
There was nothing to report on the League of California Cities Priority Focus dated December 5, 2008.

ITEMS FOR FUTURE CITY COUNCIL CONSIDERATION
There were no requests for future City Council consideration.

The City Council adjourned at 8:59 p.m.

Respectfully submitted,

COLLEEN J. NICOL
City Clerk

RESOLUTION NO. 21767

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF RIVERSIDE, CALIFORNIA, OF INTENT TO DRAFT A GROUNDWATER MANAGEMENT PLAN FOR THE RIVERSIDE GROUNDWATER BASIN

WHEREAS, the City of Riverside ("City") is a California charter city and municipal corporation that provides water service to all or a portion of the Riverside Groundwater Basin ("Basin"), a basin which is not subject to groundwater management pursuant to other provisions of law or a court order, judgment or decree; and

WHEREAS, in 1992, the California Legislature enacted Assembly Bill 3030 to provide local public agencies increased management authority over their groundwater resources and subsequently enacted Senate Bill 1938 to encourage local public agencies to adopt groundwater management plans in order to increase their eligibility for grant funds for groundwater related projects (Water Code section 10750); and

WHEREAS, the Legislature has also declared that the additional study of groundwater resources is necessary to better understand how to manage groundwater effectively to ensure the safe production, quality, and proper storage of groundwater in the State; and

WHEREAS, the adoption of a groundwater management plan is encouraged, but not required, by law; and

WHEREAS, prior to adopting a resolution of intention to draft a groundwater management plan, Water Code section 10753.2 requires a local agency to hold a hearing, after publication of notice pursuant to Government Code Section 6066, on whether or not to adopt a resolution of intention to draft a GWMP; and

WHEREAS, pursuant to Government Code Section 6066, the City duly published notice of a public hearing before the City's Board of Public Utilities on whether or not to adopt a resolution of intention to draft a groundwater management plan for the Basin; and

WHEREAS, the Board of Directors conducted such public hearing on November 21, 2008 at 8:30 AM in the Riverside Public Utilities Board Room, 3901 Orange Street, Riverside, California.

CITY ATTORNEY'S OFFICE
3900 MAIN STREET
RIVERSIDE, CA 92522
(951) 826-5567

NOW, THEREFORE, BE IT RESOLVED by the City Council of the City of Riverside, California, as follows:

Section 1: To adopt a resolution of intention to draft a groundwater management plan for the Riverside Basin in accordance with the provisions of Water Code sections 10750 *et seq.*

Section 2: Direct the City Clerk to publish the Resolution of Intention under Government Code Section 6066 pursuant to Water Code Section 10753.3(a).

Section 3: Direct staff to prepare a groundwater management plan for the Riverside Basin by March 2010 in accordance with Water Code sections 10750 *et seq.*

ADOPTED by the City Council this 16th day of December, 2008.

Mayor of the City of Riverside

ATTEST:

City Clerk of the City of Riverside

I, Colleen J. Nicol, City Clerk of the City of Riverside, California, hereby certify that the foregoing resolution was duly and regularly introduced and adopted at a meeting of the City Council of said City at its meeting held on the 16th day of December, 2008, by the following vote, to wit:

Ayes: Councilmembers Gardner, Melendrez, Bailey, Schiavone, Mac Arthur, Hart, and Adams

Noes: None

Absent: None

Abstain: None

IN WITNESS WHEREOF, I have hereunto set my hand and affixed the official seal of the City of Riverside, California, this 19th day of December, 2008.

City Clerk of the City of Riverside

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CITY ATTORNEY'S OFFICE
3900 MAIN STREET
RIVERSIDE, CA 92522
(951) 826-5567

THE PRESS-ENTERPRISE

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951-368-9018 FAX

PROOF OF PUBLICATION
(2010, 2015.5 C.C.P.)

Press-Enterprise

PROOF OF PUBLICATION OF

Ad Desc.: PH -R-21767

I am a citizen of the United States. I am over the age of eighteen years and not a party to or interested in the above entitled matter. I am an authorized representative of THE PRESS-ENTERPRISE, a newspaper of general circulation, printed and published daily in the County of Riverside, and which newspaper has been adjudicated a newspaper of general circulation by the Superior Court of the County of Riverside, State of California, under date of April 25, 1952, Case Number 54446, under date of March 29, 1957, Case Number 65673 and under date of August 25, 1995, Case Number 267864; that the notice, of which the annexed is a printed copy, has been published in said newspaper in accordance with the instructions of the person(s) requesting publication, and not in any supplement thereof on the following dates, to wit:

12-26-08
01-02-09

I Certify (or declare) under penalty of perjury that the foregoing is true and correct.

Date: Jan. 2, 2009
At: Riverside, California

RIVERSIDE CITY CLERK

3900 MAIN ST
RIVERSIDE CA 92522

Ad #: 9634480

PO #:

Agency #: _____

Ad Copy:

RESOLUTION NO. 21767
A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF RIVERSIDE, CALIFORNIA, OF INTENT TO DRAFT A GROUNDWATER MANAGEMENT PLAN FOR THE RIVERSIDE GROUNDWATER BASIN

WHEREAS, the City of Riverside ("City") is a California charter city and municipal corporation that provides water service to all or a portion of the Riverside Groundwater Basin ("Basin"), a basin which is not subject to groundwater management pursuant to other provisions of law or a court order, judgment or decree; and

WHEREAS, in 1992, the California Legislature enacted Assembly Bill 3030 to provide local public agencies increased management authority over their groundwater resources and subsequently enacted Senate Bill 1938 to encourage local public agencies to adopt groundwater management plans in order to increase their eligibility for grant funds for groundwater related projects (Water Code section 10750); and

WHEREAS, the Legislature has also declared that the additional study of groundwater resources is necessary to better understand how to manage groundwater effectively to ensure the safe production, quality, and proper storage of groundwater in the State; and

WHEREAS, the adoption of a groundwater management plan is encouraged, but not required, by law; and

WHEREAS, prior to adopting a resolution of intention to draft a groundwater management plan, Water Code section 10753.2 requires a local agency to hold a hearing, after publication of notice pursuant to Government Code Section 6066, on whether or not to adopt a resolution of intention to draft a GWMP; and

WHEREAS, pursuant to Government Code Section 6066, the City duly published notice of a public hearing before the City's Board of Public Utilities on whether or not to adopt a resolution of intention to draft a groundwater management plan for the Basin; and

WHEREAS, the Board of Directors conducted such public hearing on November 21, 2008 at 8:30 AM in the Riverside Public Utilities Board Room, 3901 Orange Street, Riverside, California.

NOW, THEREFORE, BE IT RESOLVED by the City Council of the City of Riverside, California, as follows:

Section 1: To adopt a resolution of intention to draft a groundwater management plan for the Riverside Basin in accordance with the provisions of Water Code sections 10750 et seq.

Section 2: Direct the City Clerk to publish the Resolution of Intention under Government Code Section 6066 pursuant to Water Code Section 10753.3(a).

Section 3: Direct staff to prepare a groundwater management plan for the Riverside Basin by March 2010 in accordance with Water Code sections 10750 et seq.

ADOPTED by the City

RECEIVED
JAN 12 2009
City of Riverside
City Clerk's Office

THE PRESS-ENTERPRISE

CLASSIFIED ADVERTISING PROOF

Printed by: **Tinajero, Maria**
at: **11:14 am**
on: **Tuesday, Nov 02, 2010**

Ad #: **10453220**

3450 Fourteenth St.
Riverside, CA 92501-3878
1-800-880-0345
951-684-1200
951-368-9018 Fax

Account Information

Phone #:	(951) 782-0330
Name:	RIVERSIDE PUBLIC UTILITIES
Address:	3900 MAIN ST RIVERSIDE CA 92522
Acct #:	047182
Client:	
Placed by:	Marjorie Mitchell
Fax #:	(951)

Ad Information

Classification:	Legals
Publications:	Press-Enterprise
Start date:	**11-04-10**
Stop date:	**11-11-10**
Insertions:	2
Rate code:	LE-City
Ad type:	Ad Liner
Taken by:	Tinajero, Maria
Size:	2x66.150
Bill size:	133.00x 5.14 agate lines
Amount due:	**$279.30**

Ad Copy:

Riverside Public Utilities Notice of Public Hearing
Groundwater Management Plan

NOTICE IS HEREBY GIVEN that at 8:30 a.m. on November 19, 2010, at the Public Utilities Board Room, 3901 Orange Street (Orange and Ninth Streets), Riverside, California 92501, Riverside Public Utilities (RPU) will hold a public hearing on whether or not to adopt a renewed resolution of intention to draft a groundwater management plan (GWMP) for the Riverside Groundwater Basin pursuant to California Water Code section 10750 et seq. for the purposes of implementing the plan and establishing a groundwater management program. Riverside had adopted on December 16, 2008, a Resolution of Intent to draft this GWMP for the Riverside Basin. However, as the plan will not be completed within the two year period beginning from the date of that adoption, as mandated by the Water Code, Riverside is now required to adopt a new resolution.

Members of the public, including landowners within the RPU service area and the Riverside groundwater basin, and any other interested parties, are invited to attend the hearing. Draft copies of the proposed resolution of intention to draft a GWMP will be available for review by the public at the hearing or may be obtained in advance of the hearing at the RPU offices at 3901 Orange Street, Riverside, California 92501. Opportunity for public comment and input will be provided at the hearing. In accordance with Water Code section 10753.4(b), interested parties who wish to participate in developing the GWMP may do so by attending the hearing and indicating their interest, or by submitting a written request to participate, to the attention of David Garcia, RPU, 3025 Madison Street, Riverside, California 92504.

The City of Riverside wishes to make all of its public meetings accessible to the public. Upon request, the proposed resolution of intent document will be made available in appropriate formats to persons with disabilities, as required by Section 202 of the Americans with Disabilities Act of 1990. Any person with a disability who requires a modification or accommodation in order to participate in a meeting should direct such request to the City's ADA Coordinator at (951) 826-5427 or TDD at (951) 826-5439 at least 72 hours before the meeting, if possible.

The public is invited to attend and comment in the process described above. Written comments may also be submitted to RPU for inclusion in the public record. Any person unable to attend the public hearing may submit written comments to RPU, 3025 Madison Street, Riverside, California 92504. If you have questions regarding this notice or the matter to be heard, please contact David Garcia at (951) 826-5612. In addition, a website has been established as an information source throughout the development process of the GWMP at www.riversideplan.com. 11/4, 11

CITY OF RIVERSIDE

BOARD OF PUBLIC UTILITIES

Minutes of:	Regular Meeting of the Board of Public Utilities
Date of Meeting:	November 19, 2010
Time of Meeting:	8:30 a.m.
Place of Meeting:	Public Utilities Boardroom 3901 Orange Street (at Ninth & Orange Streets) Riverside, California

PLEDGE OF ALLEGIANCE TO THE FLAG WAS GIVEN

PUBLIC HEARING

Chair Ken Sutter called the public hearing meeting to order at 8:30 a.m.

Chair Sutter stated to the audience that the Board of Public Utilities was holding a public hearing to receive public input regarding the City of Riverside's renewed intent to draft a groundwater management plan (GWMP) for the Riverside Basin in accordance with the requirements of Water Code sections 10750 et. seq. and to receive public comment regarding the intention to draft the GWMP. Comments of any individual would be limited to three minutes and would be heard in order of sign up.

Roll Call

Present: Ken Sutter (Chair)
Mary Curtin (arrived late)
Ian Davidson
Darrell Ament
Bob Elliott (Vice Chair)
Bernie Titus
Justin Scott-Coe

Absent: Gustavo Segura (excused absence due to business)
Mary Curtin (arrived late @ 8:55 am)
Manny Sanchez (resigned as Board Member on 11/05/2010)

Staff Presentation
Prior to receiving public input, the Board requested staff to provide a summary of the process, which was presented by Assistant General Manager/Water Kevin Milligan.

Comments from the Audience
There were no public comments.

Close Public Hearing
There were no other comments regarding this matter, so the Board of Public Utilities closed the public hearing.

Motion – Scott-Coe. Second – Titus.

Ayes: Sutter, Elliott, Titus, Davidson, Scott-Coe, and Ament.

A. RENEWED NOTICE OF INTENT TO ADOPT A GROUNDWATER MANAGEMENT PLAN FOR THE RIVERSIDE BASIN

Following discussion, the Board of Public Utilities:

1. Conducted the initial public hearing regarding the City of Riverside's renewed intent to draft a groundwater management plan (GWMP) for the Riverside Basin in accordance with the requirements of Water Code sections 10750 et. seq. and to receive public comment regarding the intention to draft the GWMP; and

2. Recommended that the City Council adopt a renewed resolution of intention to draft the GWMP for the Riverside Basin.

Motion – Scott-Coe. Second – Davidson.

Ayes: Sutter, Elliott, Titus, Davidson, Scott-Coe, and Ament.

PRESENTATION

B. EMPLOYEE RECOGNITION AWARDS

The following were each presented with a SPAM award from General Manager Wright:

Gayla Branco – Customer Service Representative II
Jalene Isaac – Customer Service Representative II
Teresa DeCoud – Customer Service Representative II

Rosie Chaira – Public Benefits Sr. Office Specialist
Jessica Tonkovich – Public Benefits Office Specialist
Griselda Rivera – Public Benefits Customer Service Representative II

MINUTES

1. The approval of the regular meeting minutes from the Board of Public Utilities meeting held on November 5, 2010 were approved as submitted.

Motion – Davidson. Second – Scott-Coe.

Ayes: Sutter, Elliott, Titus, Davidson, and Scott-Coe.

Abstain: Ament.

Absent: Gustavo Segura (excused absence due to business)
Mary Curtin (arrived late @ 8:55 am))
Manny Sanchez (resigned as Board Member on 11/05/2010)

CITIZENS PARTICIPATION

If you would like to speak regarding a matter not on the printed Agenda, please come forward and stand until recognized by the Chair – ***Public Participation is limited to 3 minutes on all items included in the agenda.***

None.

COMMITTEE REPORTS

2. Committee Reports– are included as applicable
   a. Electric Committee
      The November 5, 2010 meeting was cancelled.

   b. Water Committee
      The Board of Public Utilities accepted and filed the November 5, 2010 "Special" Water Committee minutes.

   c. Finance/Marketing Committee
      None.

CONSENT CALENDAR

A motion was made to approve the following items on the Consent Calendar:

Motion – Titus. Second – Davidson.

Ayes: Sutter, Elliott, Titus, Davidson, Scott-Coe, and Ament.

Electric Items

3. UNDERGROUND ELECTRIC LINE EXTENSION – DOLE FOODS DISTRIBUTION FACILITY – WORK ORDER NO. 1023351

   The Board of Public Utilities approved the estimated capital expenditure of $283,000 to install an underground electric line extension to serve the Dole Foods Distribution Facility located between Columbia and Palmyrita Avenues, westerly of Northgate Street.

4. CONDUIT AND STRUCTURES INSTALLATION AT COLLEGE AVENUE - WORK ORDER NO. 1026945

   The Board of Public Utilities approved the estimated capital expenditure of $95,000 to replace out of date and deteriorating underground electrical cable and above ground electrical structures, located along College Avenue in the City of Riverside.

5. CASA BLANCA SUBSTATION AWARD OF EQUIPMENT PURCHASE ORDERS WORK ORDER NO. 1016403

   The Board of Public Utilities:

   1. Approved the award of a purchase order for an electrical enclosure from Crown Technical Systems, of Fontana, California, in the amount of $269,636;

   2. Approved the award of a purchase order for relay and control panel equipment including spare parts from Power Up Controls, Inc., of Garden Grove, California, in the amount of $188,289; and

   3. Approved the award of a purchase order for one 69 kV circuit switcher from S&C Electric Company, of Chicago, Illinois, in the amount of $57,201.

6. UTILITIES OPERATION CENTER IMPROVEMENTS TO ELECTRIC METER SHOP WORK ORDER NO. 1107910

The Board of Public Utilities approved Work Order No. 1107910 in the amount of $110,000 for the renovation and improvements to the Electric Meter Shop at the Riverside Public Utilities Operation Center (UOC).

Water Items

7. UTILITY AGREEMENTS BETWEEN CITY OF RIVERSIDE PUBLIC UTILITIES AND RIVERSIDE COUNTY TRANSPORATION COMMISSION, AGREEMENT NOS. 21218, 21636, 21700, 21701, 21702, 21272, AND 21979

The Board of Public Utilities recommended that the City Council:

1. Approve Utility Agreement Nos. 21218, 21636, 21700, 21701 and 21702 between the Riverside Public Utilities (RPU) and the Riverside County Transportation Commission (RCTC) for the relocation of RPU water facilities; and
2. Approve Utility Agreement Nos. 21272 and 21979 between the RPU and the RCTC for the relocation of RPU electric facilities.

8. PURCHASE OF REPLACEMENT BACKHOE FOR WATER FIELD OPERATIONS

The Board of Public Utilities authorized the expenditure of $180,000 to replace one John Deere 710 Backhoe/Loader, Asset No. L140.

Other Items

9. UTILITY SERVICES AGREEMENT (USA) BETWEEN CITY OF RANCHO CUCAMONGA AND CITY OF RIVERSIDE

The Board of Public Utilities recommended that the City Council:

1. Approve the Utility Services Agreement between the City of Rancho Cucamonga and the City of Riverside; and
2. Authorize the City Manager, or his designee, to execute the Utility Services Agreement.

DISCUSSION CALENDAR

10. ESTABLISHMENT OF WATER DIVISION CONTRACTOR'S PANEL – PAVING CATEGORY

Assistant General Manager/Water Kevin Milligan corrected an error on page 2 of the Board report – that the contracts shall be for an initial term of **three years** (not five years as stated in the report), with provisions for subsequent three-one year extensions.

Following discussion, the Board of Public Utilities recommended that the City Council:

1. Adopt a resolution, by at least five affirmative votes, waiving the formal bidding requirements of Riverside City Charter Section 1109 for the work to be performed by the Water Division Contractors' Panel to create a fifth category for Paving work;

2. Approve the establishment of the six-member Water Division Contractors' Panel for the Paving Work category as listed herein;

3. Authorize the Public Utilities General Manager to add additional qualified paving contractors to this Panel with subsequent reports back to the Board of Public Utilities from time to time on the addition of such new Panel members; and

4. Authorize the City Manager, or his designee, to execute the Master Agreements with each listed Panel member, including any members subsequently added to the Panel, in substantially the same form as attached to this report.

Motion – Titus. Second – Davidson.

Ayes: Sutter, Elliott, Titus, Davidson, Scott-Coe, and Ament.

Board Member Mary Curtin arrived at the meeting at 8:55 am.

11. PRECISION LANDSCAPE IRRIGATION NOZZLE DISTRIBUTION PROGRAM UPDATE

Following discussion, the Board of Public Utilities recommended that the City Council:

1. Approve additional funding in the amount of $150,000 from the Water Conservation and Reclamation Surcharge Un-programmed Funds for the 2010-11 Precision Landscape Irrigation Nozzle Distribution Program; and

2. Authorize the City Manager, or his designee, to increase change orders for the Precision Landscape Irrigation Nozzle Distribution Program for FY 2010-11 no more than $150,000 per vendor with the total amount not to exceed $250,000.

Motion – Scott-Coe. Second – Curtin.

Ayes: Sutter, Elliott, Curtin, Titus, Davidson, Scott-Coe, and Ament.

12. RIVERSIDE PUBLIC UTILITIES 2009-2012 THREE-YEAR STRATEGIC GOALS – UPDATE FROM OCTOBER 27, 2010 PUBLIC UTILITIES MANAGEMENT STRATEGIC PLANNING RETREAT

Following discussion, the Board of Public Utilities received and filed the updated Strategic Plan Three Year Goals and the Eight-Month Strategic Objectives for the period ending October 27, 2010.

Motion – Elliott. Second – Titus.

Ayes: Sutter, Elliott, Curtin, Titus, Davidson, Scott-Coe, and Ament.

13. ELECTRIC AND WATER FINANCIAL YEAR - END UPDATE FOR FISCAL YEAR 2009-2010

Following discussion, the Board of Public Utilities received and filed this oral update.

Motion – Elliott. Second – Ament.

Ayes: Sutter, Elliott, Curtin, Titus, Davidson, Scott-Coe, and Ament.

14. ITEMS FOR FUTURE BOARD OF PUBLIC UTILITIES CONSIDERATION AS REQUESTED BY A MEMBER OF THE BOARD OF PUBLIC UTILITIES

- RERC 3 Update
- General Fund Employees Transferred to Public Utilities and Potential Impact on the Pension System

GENERAL MANAGER'S REPORT

15. State and Federal Stimulus Fund Update - Discussion of any potential benefits to Riverside Public Utilities

16. State and Federal Legislative Update - Update on pending legislation that may impact the Water and/or Electric Utility

17. Monthly Update of Goals (See Item #12)

18. Electric / Water Contract Panel Update - November 2010

19. Open and Closed Work Orders - October 2010

20. Water Highlights - October 2010

21. City Council Agendas – November 9, 2010 and November 16, 2010

22. Upcoming Meetings

23. Systematic Reporting on Conferences/Seminars by Board Members and/or Staff

24. Electric / Water Utility Acronyms

UPCOMING MEETING

Chair Ken Sutter adjourned the meeting at approximately 10:08 a.m. to the next regularly scheduled meeting of the Board of Public Utilities to be held on **December 3, 2010** at **8:30** a.m. in the Public Utilities Boardroom located at 3901 Orange Street in Riverside, California.

By: David H. Wright

David H. Wright, Secretary
Board of Public Utilities

Approved by: City of Riverside Board of Public Utilities

Dated: December 3, 2010

CITY COUNCIL, REDEVELOPMENT AGENCY, AND HOUSING AUTHORITY MINUTES

TUESDAY, DECEMBER 14, 2010, 2 P.M.
ART PICK COUNCIL CHAMBER
CITY HALL
3900 MAIN STREET

		COUNCIL/AGENCY MEMBERS						
		GARDNER	MELENDREZ	BAILEY	DAVIS	MAC ARTHUR	HART	ADAMS
	WARDS	1	2	3	4	5	6	7
Roll Call:	Present	X	X	X	X	X	X	X
Mayor Loveridge called the meeting to order at 2 p.m. with all Councilmembers present.								
WORKSHOP								
2011 STATE AND FEDERAL LEGISLATIVE PLATFORM Following discussion, the City Council (1) approved the proposed 2011 State and Federal Legislative Platform as outlined in the written staff report; and (2) directed staff to coordinate with the City's State and Federal legislative advocacy teams to advance the approved legislative priorities and continue to provide updates to the Mayor and City Council.	Motion Second All Ayes			X				X
PUBLIC HEARINGS/PLANNING REFERRALS AND APPEALS								
Councilmember Hart left the dais during the following item.							A	
CASE P10-0249 - ZONING CODE AMENDMENT - ORDINANCE INTRODUCED Hearing was called on the proposal by the City of Riverside to amend the Zoning Code (Title 19) to insert language related to permitted land uses for the RA-5 - Residential Agricultural and RC - Residential Conservation Zones into Chapter 19.100 - Residential Zones. No one spoke on the matter. The public hearing was officially closed. Following discussion, the City Council (1) determined that the proposed project is exempt from California Environmental Quality Act (CEQA) review pursuant to Section 15061(b)(3) as it can be seen with certainty that there is no possibility that this proposed amendment to the Zoning Code will have a significant effect on the environment and all prior environmental impacts were thoroughly analyzed by the General Plan 2025 Program Final Program Environmental Impact Report, which was certified by the Riverside City Council on November 20, 2007; (2) approved Case P10-0249 based on and subject to the Planning Commission findings and recommendations as outlined in the written staff report; and (3) introduced an ordinance to amend Chapter 19.100 of the Zoning Code to insert language related to the permitted land uses for the RA-5 and RC Zones; whereupon, an ordinance entitled "An Ordinance of the City of Riverside, California, Amending Chapter 19.100 of the Riverside Municipal Code to Add Language Related to Permitted Land Uses for the Residential Agricultural and Residential Conservation Zones", was presented and introduced.	Motion Second All Ayes				X	X		

		COUNCIL/AGENCY MEMBERS						
		GARDNER	MELENDREZ	BAILEY	DAVIS	MAC ARTHUR	HART	ADAMS
	WARDS	1	2	3	4	5	6	7
Councilmember Hart returned to the dais during the following item.							X	
CASE P10-0258 - CONDITIONS OF APPROVAL - 7745, 7755, AND 7769 INDIANA - CONTINUED Following discussion, the public hearing on the proposal by A.C. and Shirley J. Nejedly, Trustees of the Nejedly Family Trust, to modify previously approved conditions of approval for Rezoning Case R-72-867, specifically to revise a recorded covenant and agreement to remove a requirement for mutual parking on three adjacent parcels located at 7745, 7755, and 7769 Indiana Avenue, in the CG-S-2-X-SP - Commercial General, Two-Story Height of Buildings, Building Setback and Specific Plan Overlay Zones was continued to January 25, 2011, at 3 p.m.	Motion Second All Ayes				X		X	
PRESENTATIONS								
Mayor Loveridge called upon Riverside County Department of Animal Services Director Robert Miller and Deputy Director Frank Corvino to introduce the Home for the Holidays pet adoption program.								
Councilmember Bailey presented an update on Seizing Our Destiny - Route 3. No formal action was required or taken.								
WORKSHOP								
REFLECTIONS ON NATIONAL LEAGUE OF CITIES PRESIDENCY This item was continued.								
ORAL COMMUNICATIONS FROM THE AUDIENCE There were no oral comments at this time.								
CLOSED SESSIONS								
The City Council recessed to the City Council Board Room for closed sessions pursuant to Government Code (1) §54956.8 to instruct City's Negotiator, Bradley J. Hudson, regarding price and terms of payment for the purchase, sale, exchange or lease of 3750 University Avenue, APN: 215-371-001, by Best, Best & Krieger; Aaron Wright, Broker Studley, Inc.; (2) §54956.9(a) to confer with and/or receive advice from legal counsel concerning Russell Leach v. City of Riverside, WCAB Claim No.(s): 060080; 100091; and (3) §54957.6 to review the City Council's position and instruct designated representatives regarding salaries, salary schedules, or compensation paid in the form of fringe benefits of all Executive Management								

employees, all Management and Confidential employees as defined by PERS, Fire Management Unit, Riverside City Firefighters Association, Riverside Police Officers Association (Police and Police Supervisory Units), Service Employees International Union #721, International Brotherhood of Electrical Workers #47, and Riverside Police Administrators Association.

The Redevelopment Agency recessed to the City Council Board Room for a closed session pursuant to Government Code §§54956.9(a) to confer with and/or receive advice from legal counsel concerning Redevelopment Agency of the City of Riverside v. Joel Udayke dba Flowerloft, RCSC Case No. MVC 10006039.

RECESS
The City Council recessed at 5:12 p.m. and reconvened at 6:17 p.m. in the Art Pick Council Chamber with Mayor Loveridge presiding and all Councilmembers present except Councilmember Hart. — A

METROPOLITAN MUSEUM BOARD REPORT
Metropolitan Museum Board Chair Venita Jorgensen presented a report on the activities of the Metropolitan Museum Board. Following the presentation, and without formal motion, the City Council received and ordered filed the report.

The invocation was given by Councilmember Bailey.

The Pledge of Allegiance was given to the Flag.

Councilmember Hart arrived at this time. — X

Mayor Loveridge called upon Salvation Army Major Rick Peacock and Advisory Board Member William Bailey, Jr., who introduced the preschool choir.

Mayor Loveridge called upon Riverside Arts Council Executive Director Patrick Brien who recognized Jordan Beck and the Caffeinated Cabaret as Arts Honoree of the Month for December.

Les Davidson of Wagon Wheel Enterprises presented a check to Joe Bonaminio, father of slain Riverside Police Officer Ryan Boniminio, who presented the check to Riverside Police Officer Association President Officer Cliff Mason.

		COUNCIL/AGENCY MEMBERS						
		GARDNER	MELENDREZ	BAILEY	DAVIS	MAC ARTHUR	HART	ADAMS
	WARDS	1	2	3	4	5	6	7
Mayor Loveridge called upon Optimist Club representative Mark Cloud who presented the Youth Appreciation Program.								
Mayor Loveridge recognized Governor State Board and Commission appointments: Ramon Alvarez, New Motor Vehicle Board; Mike Gardner, Seismic Safety Commission, Dave Wright, Health Professions Education Foundation Board of Trustees, and special guest State Representative for 66th Assembly District, Kevin Jeffries.								
NEIGHBORHOOD SUCCESS REPORT Following discussion and without formal motion, the City Council received and ordered filed the Riverside Neighborhood Partnership Neighborhood Success report presented by Board Member Gurumantra Khalsa highlighting the Sycamore Highlands Community Action Group.								
<u>DISCUSSION CALENDAR</u>								
CRYSTAL VIEW TERRACE AND GREEN ORCHARD PLACE GATES - SUPPLEMENTAL APPROPRIATION Following discussion, the City Council approved the recommendations of the City Council Transportation Committee to (1) initiate the appropriate environmental reviews to consider permanently opening the gates at Crystal View Terrace and Green Orchard Place in relationship to the Overlook Parkway Crossing; (2) direct the gates remain open during the study period in order to provide additional traffic counts and empirical documentation to assist in the preparation of the environmental documents; (3) authorize installation of the Phase 1 traffic safety measures including a combination of traffic stops and speed humps; and (4) authorize a supplemental appropriation in the amount of $447,912.22 from Overlook Parkway Crossing/Alessandro Arroyo Bridge Impact Fee Accounts with $412,013.19 to Account 9524028-440304 and $35,899.03 to Account 9524036-440304 to complete the environmental review.	Motion Second All Ayes				X			X
SEIZING OUR DESTINY - ECONOMIC DEVELOPMENT INITIATIVES Following discussion, the City Council received and ordered filed the report on Riverside's economic snapshot and proactive economic development initiatives. No formal action was required or taken.								
WESTERN RIVERSIDE COUNTY TRANSPORTATION UNIFORM MITIGATION FEE PROGRAM - RESOLUTION - ORDINANCE INTRO. Following discussion, the City Council (1) approved a fee reduction of 50% through December 31, 2011, or until notification from Western Regional								

		COUNCIL/AGENCY MEMBERS						
		GARDNER	MELENDREZ	BAILEY	DAVIS	MAC ARTHUR	HART	ADAMS
	WARDS	1	2	3	4	5	6	7
Council of Governments (WRCOG) that the program losses exceed $20 million and the fee reverts to 100 percent; (2) adopted a resolution to extend the temporary TUMF fee reduction; and (3) introduced the appropriate ordinance; whereupon, the title having been read and further reading waived, Resolution No. 22137 of the City Council of the City of Riverside, California, Extending the Temporary Fee Reduction Period Under the Western Riverside County Transportation Uniform Mitigation Fee (TUMF) Program, was presented and adopted; and an ordinance entitled "An Ordinance of the City of Riverside, California, Extending the Temporary TUMF Reduction Period Under the Western Riverside County Transportation Mitigation Fee (TUMF) Program", was presented and introduced.	Motion Second All Ayes					X		X
ORAL COMMUNICATIONS FROM THE AUDIENCE Salvador Santana spoke regarding 2010 and Christmas. Phyllis Purcell Spoke regarding City services, foreclosures, and banks. Karen Wright spoke regarding the City auditor and the Consent Calendar. Britt Holmstrom spoke regarding the City of Riverside and jobs.								
MAYOR/COUNCILMEMBER COMMUNICATIONS								
BRIEF STATUS REPORTS FOR REGIONAL ORGANIZATIONS, CONFERENCES, SEMINARS, AND MEETINGS ATTENDED BY MAYOR AND CITY COUNCIL Councilmember Adams reported on the National Multi-Modal Transportation Steering Committee expedition to Panama Canal.								
CITY ATTORNEY REPORT ON CLOSED SESSIONS Supervising Deputy City Attorney Smith announced that there were no reportable actions taken on the closed sessions held earlier in the day.								
CONSENT CALENDAR The following items were approved by one motion affirming the actions appropriate to each with the item regarding the Highgrove Backbone Sewer Project being removed from agenda and Councilmember Bailey disqualifying himself from item regarding the Mills Act Contracts, Cases P10-0395, 0435, 0455, 0461, 0462, 0463, 0471, and 0473 as a family member owns one of the properties.	Motion Second All Ayes						X	X
MAYOR AND COUNCILMEMBER SALARY REVIEW - PUBLIC HEARING SCHEDULED The City Council set a public hearing for January 18, 2011, at 3 p.m. to review the compensation of the Mayor and Members of the City Council as								

required by the Riverside City Charter.

OFFICIAL POLICE TOW TRUCK SERVICE - ORDINANCE ADOPTED
The City Council adopted an ordinance amending Title 5, Chapter 5.15 of the Municipal Code to clarify and streamline the regulation of official police tow truck service; whereupon, the title having been read and further reading waived, Ordinance No. 7106 of the City of Riverside, California, Amending Chapter 5.15 of the Riverside Municipal Code Relating to Regulation of the Riverside Police Tow Truck Service in the City of Riverside, was presented and adopted.

JOINT ITEM WITH REDEVELOPMENT AGENCY AND HOUSING AUTHORITY - MINUTES
The Minutes of the City Council, Redevelopment Agency, and Housing Authority Meeting of December 7, 2010, were approved as presented.

CONFLICT OF INTEREST CODE AMENDMENTS - RESOLUTION
The City Council adopted the resolution amending the Conflict of Interest Code for designated City employees and officials thereby repealing Resolution No. 21765; whereupon, the title having been read and further reading waived, Resolution No. 22138 of the City Council of the City of Riverside, California, Amending the Conflict of Interest Code of the City of Riverside for City Employees and Officials in its Entirety and By Repealing Resolution No. 21765 Which Amendment is to be Effective Upon Adoption, was presented and adopted.

ANNOUNCEMENT OF COMMITTEE MEETINGS
The Utility Services/Land Use/Energy Development Committee will meet at 3 p.m. on Thursday, December 16, 2010, in the Seventh Floor Conference Room. The Development Committee will meet at 4 p.m. on Thursday, December 16, 2010, in the Mayor's Ceremonial Room.

CASE P09-0111 - ANNEXATION 116 (PIM) - ORDINANCE ADOPTED
The City Council adopted an ordinance relative to Case P09-0111 adding the area of Annexation 116 (Pim) to the First Ward; whereupon, the title having been read and further reading waived, Ordinance No. 7107 of the City of Riverside, California, Amending Section 1.12.020 of the Riverside Municipal Code by Adding to the First Ward the Territory Designated as "LAFCO No. 2010-10-1 Reorganization to Include Annexation No. 116 to the City of Riverside and Concurrent Detachment From the Jurupa Area Recreation and Park District and the Riverside County Waste Resources Management District" as of the Effective Date of Such Annexation to the City of Riverside",

was presented and adopted.

CASE P10-0294 - CULTURAL RESOURCES CODE AMENDMENT - ORDINANCE ADOPTED
The City Council adopted an ordinance relative to Case P10-0294 to amend the Cultural Resources Code (Title 20) to include overall updates in policy, modified processes for Administrative and Board level approvals, revised designation criteria for Landmarks and Structures of Merit, and the addition of sections on enforcement and penalties for illegal demolitions and Duty to Maintain; whereupon, the title having been read and further reading waived, Ordinance No. 7108 of the City of Riverside, California, Amending the Riverside Municipal Code by Amending and Replacing Title 20, Cultural Resources in its Entirety, was presented and adopted.

CASE P10-0381 - ZONING CODE AMENDMENTS - ORDINANCE ADOPTED
The City Council adopted an ordinance relative to case P10-0381 to amend the Zoning Code (Title 19) for technical and clarifying changes to Chapter 19.100 - Residential Zones to clarify the side setback requirement in all residential zones; Chapter 19.110 - Commercial and Office Zones to clarify the rear yard setback for the Office Zone; Chapter 19.150 - Base Zones Permitted Uses to include outdoor dining in the Permitted Uses and Incidental Uses Tables; Chapter 19.440 - Accessory Buildings and Structures to clarify that maximum floor area provisions for accessory structures are not applicable to the Residential Agricultural (RA-5) and Residential Conservation (RC) Zones; Chapter 19.455 - Animal Keeping to reflect existing provisions for bee keeping found in the Animal Code (Title 8); to reinsert Chapter 19.527 - Vehicle Repair Personal into the Zoning Code to allow personal vehicle repair in residential zones; Chapter 19.550 - Fences, Walls, and Landscape Materials to include a reference to the Cultural Resources Code (Title 20) and the Cultural Heritage Board's Design Guidelines; and, Chapter 19.580 - Parking and Loading to clarify the parking requirements for bed and breakfast inns, the provisions for second driveways, the parking of recreational vehicles in the Residential Estate (RE) Zone, the provisions for tandem parking, and amend the parking figures; whereupon, the title having been read and further reading waived, Ordinance No. 7109 of the City of Riverside, California, Amending Chapters 19.110, 19.140, 19.150, 19.440, 19.455, 19.550, 19.580, and 19.670 of the Riverside Municipal Code and Further Including a New Chapter 19.527, was presented and adopted.

	WARDS	COUNCIL/AGENCY MEMBERS: GARDNER 1	MELENDREZ 2	BAILEY 3	DAVIS 4	MAC ARTHUR 5	HART 6	ADAMS 7
CASES P10-0395, 0435, 0455, 0461, 0462, 0463, 0471, AND 0473 - MILLS ACT HISTORIC PRESERVATION CONTRACTS - 5121 MAGNOLIA, 2374 MISSION INN, 3557 BANDINI, 3682 OAKWOOD, 4450 SIXTH, 3587 MT. RUBIDOUX, 2320 MARY, AND 5175 MYRTLE - RESOLUTION The City Council approved the recommendations of the City Council Utility Services/Land Use/Energy Development Committee to (1) adopt a resolution amending Resolution No. 20825 to allow an average, rather than a maximum of seven Mills Act contracts per calendar year; (2) approve the Mills Act contracts with Roderick and Leah Stuart, Salvador M. and Sandra G. Diaz, Steven Anderson, Matthew W. Tudor, Tobin J. and Cathy S. Holmes, David M. and Kara Shea Davis Crohn, Timothy J. and Jenny M. Pietro, and Christopher T. and Kristen Sumiko Grigsby for properties located at 5121 Magnolia, 2374 Mission Inn, and 3557 Bandini Avenues, 3682 Oakwood Place, 4450 Sixth Street, 3587 Mt. Rubidoux Drive, 2320 Mary Street, and 5175 Myrtle Avenue; and (3) authorize the City Manager, or his designee, to execute the contracts; whereupon, the title having been read and further reading waived, Resolution No. 22139 of the City Council of the City of Riverside, California, Amending Section 5 of Resolution No. 20825 to Change the Number of Mills Act Historic Preservation Contract Applications That Will Be Accepted and Processed for Each Year, was presented and adopted.	Disqualified			X				
REDEVELOPMENT AGENCY - AGREEMENT - PROPERTY MANAGEMENT AND COMMERCIAL LEASING SERVICES - 3737 MAIN The Redevelopment Agency approved an extension to the first amendment to the agreement with Inland Pacific Advisors, Inc., for property management and commercial leasing services on a month-to-month basis at California Tower located at 3737 Main Street.								
HOUSING AUTHORITY - AGREEMENT AMENDMENTS - NEIGHBORHOOD STABILIZATION AND TARGETS OF OPPORTUNITY PROGRAMS The Housing Authority approved amendments to agreements with Frazier Group Realty, Inc., and C. Lee Enterprises, Inc., DBA Tower Realty to increase the maximum annual compensation from $50,000 to $100,000 per year for asset management and real estate services associated with properties acquired through the Neighborhood Stabilization and Targets of Opportunity Programs.								

	WARDS	COUNCIL/AGENCY MEMBERS: GARDNER 1	MELENDREZ 2	BAILEY 3	DAVIS 4	MAC ARTHUR 5	HART 6	ADAMS 7
SEIZING OUR DESTINY - AGREEMENT AMENDMENTS - FOX PERFORMING ARTS CENTER The City Council (1) approved the Second Amendment to the Professional Consultant Services Agreement with FX Arts Management, LLC, formerly William P. Malone to amend financial reporting and operating budget disbursement procedures; (2) approved the Professional Consultant Services Agreement with FX Concessions, LLC, for exclusive operation and management of concessions for the Fox Performing Arts Center; and (3) authorized the City Manager, or his designee, to execute the agreements and to make non-substantive changes as deemed necessary.								
REDEVELOPMENT AGENCY - MT AUTO USED CAR LOT - 3245 MARKET - SUPPLEMENTAL APPROPRIATION The Redevelopment Agency authorized a supplemental appropriation in the amount of $430,000 from Merged Downtown/Airport/Hunter Park/Northside Fund Balance Account 000475-298000 to 3245 Market Street Account 9849600 for acquisition, site clearance, and temporary maintenance of MT Auto Used Car Lot located at 3245 Market Street.								
FIREFIGHTERS CHARITABLE FOUNDATION GRANT - SUPPLEMENTAL APPROPRIATION The City Council (1) authorized acceptance of the Firefighters Charitable Foundation, Inc., grant in the amount of $500 for purchase of equipment, supplies, and training; (2) authorized a $500 increase in estimated revenues in Account 0000101-374200 and increased appropriations in the same amount to Account 3510000-426200; and (3) directed the Fire Chief to send a letter of appreciation to Frank R. Tepedino, President of the Firefighters Charitable Foundation.								
LICENSE AGREEMENT - RIVERSIDE ARTS COUNCIL - 3485 MISSION INN The City Council (1) approved the License Agreement with Riverside Arts Council for the month-to-month lease of 2,000 square feet of office space at the Riverside Municipal Auditorium located at 3485 Mission Inn Avenue; and (2) authorized the City Manager, or his designee, to make non-substantive changes and to execute the agreement.								
LICENSE AGREEMENT - RIVERSIDE COUNTY PHILHARMONIC - 3485 MISSION INN The City Council (1) approved the License Agreement with The Riverside County Philharmonic for the month-to-month lease of 695 square feet of office/storage space at the Riverside Municipal Auditorium located at								

3485 Mission Inn Avenue; and (2) authorized the City Manager, or his designee, to make non-substantive changes and to execute the agreement.

AGREEMENT AMENDMENT - MANAGED PRINT SERVICES
The City Council (1) approved the first amendment to the agreement with ACS Enterprise Solutions, Inc., in the amount of $22,656 per month plus meter charges for implementation of managed print services and to fold in existing leases of multiple print/copier hardware into a consolidated agreement; (2) established Xerox as the City standard for future purchases of multi-function printers to ensure compatibility with ACS' managed print services and reduced cost for supplies; and (3) authorized the City Manager, or his designee, to execute the first amendment and lease extensions, including making minor, non-substantive changes, and to sign all documents and instruments necessary to implement the amendment.

AGREEMENT AMENDMENT - ANNUAL LANDSCAPE MAINTENANCE
The City Council (1) authorized the fourth amendment to the agreement with Excel Landscape, Inc., for $1,188,792 for annual landscape maintenance of various neighborhood parks extending the term of the original agreement through December 31, 2012; (2) authorized the issuance of change orders in an amount not-to-exceed ten percent of the amended contract price to cover costs of irrigation and vandalism repairs; and (3) authorized the City Manager, or his designee, to execute the amendment.

AGREEMENT AMENDMENT - ANNUAL LANDSCAPE MAINTENANCE
The City Council (1) authorized the fourth amendment to the agreement with Azteca Landscape for $148,248 for annual landscape maintenance of various neighborhood parks extending the term of the original agreement through December 31, 2012; and (2) authorized the City Manager, or his designee, to execute the amendment.

CITIZEN'S OPTION FOR PUBLIC SAFETY GRANT - SUPPLEMENTAL APPROPRIATION
The City Council (1) accepted $355,399.36 from the State of California Citizen's Option for Public Safety (COPS) 2011 grant program as revenue into Account 000721-225170; (2) appropriated $355,399.36 plus projected interest into a project expenditure account to be assigned by the Finance Division; (3) approved the continued funding of salaries and benefits for one Senior Office Specialist, one Police Records Specialist, and one Administrative Analyst to be charged against the Police Department State COPS project expenditure account with any remaining funds to be used for technology to support the records management system (RMS); and

(4) authorized the City Manager, or his designee, to make non-substantive changes and to execute the necessary documents.

GROUNDWATER MANAGEMENT PLAN - RIVERSIDE BASIN - RESOLUTION
The City Council adopted a renewed resolution of intention to draft the Groundwater Management Plan for the Riverside Basin; whereupon, the title having been read and further reading waived, Resolution No. 22140 of the City Council of the City of Riverside, California, of Intent to Draft a Groundwater Management Plan for the Riverside Groundwater Basin, was presented and adopted.

AGREEMENT AMENDMENT - WATER QUALITY CONTROL PLANT EXPANSION
The City Council approved the First Amendment to the Professional Consultant Services Agreement with MWH Americas for project management services for the Riverside Water Quality Control Plant (WQCP) expansion to extend its term to December 31, 2011.

CONTRACT AMENDMENT - ANIMAL PROTECTION SERVICES
The City Council approved the Second Amendment to the Contract for Animal Shelter Services with the County of Riverside for animal web-licensing services effective December 15, 2010.

BID 6894 - BID REJECTION - COMPRESSED NATURAL GAS REFUSE TRUCKS
The City Council rejected Bid 6894 for the purchase of three Compressed Natural Gas (CNG) Automated Refuse Trucks for the Public Works Solid Waste Division.

REIMBURSEMENT AGREEMENT - HIGHGROVE BACKBONE SEWER PROJECT - PALMYRITA TO CITY LIMIT LINE
This item was removed from agenda.

AGREEMENT - SOIL BORINGS AND ANALYSIS - CITY QUARRY - FREMONT/MOUNTAIN VIEW
The City Council approved a Professional Consultant Services Agreement with AMEC Geomatrix, Inc., in an amount not-to-exceed $60,500 for soil borings and testing at the City's Quarry located at Fremont Street and Mountain View Avenue.

CITY COUNCIL, REDEVELOPMENT AGENCY, AND HOUSING AUTHORITY MINUTES

TUESDAY, DECEMBER 14, 2010, 2 P.M.
ART PICK COUNCIL CHAMBER
CITY HALL
3900 MAIN STREET

	WARDS	COUNCIL/AGENCY MEMBERS						
		GARDNER	MELENDREZ	BAILEY	DAVIS	MAC ARTHUR	HART	ADAMS
		1	2	3	4	5	6	7
DISCUSSION CALENDAR								
NET ENERGY METERING INTERCONNECTION AGREEMENT - RESOLUTION Following discussion, the City Council (1) approved proposed changes and adopted a resolution to modify the Electric Net Energy Metering Rate for Solar or Wind Turbine Electric Generating Facilities (Schedule NEM), a new Feed-In Tariff Rate for Renewable Energy Generation Facilities (Schedule FIT), closed the electric Domestic Time-of-Use Rate (Schedule D-T-O-U) to new customers, and modified Electric Rules 10 Distribution System Additions (Electric Rule 10) and Electric Service Facilities (Electric Rule 11) as outlined in the written staff report; and (2) approved changes to the NEM Interconnection Agreement (Standard Contract - NEM) for applicable NEM customers; whereupon, the title having been read and further reading waived, Resolution No. 22141 of the City Council of the City of Riverside, California (1) Adopting Revised Electric Rate Schedule NEM (Net Energy Metering For Solar Or Wind Turbine Electric Generating Facilities) and New Schedule FIT (Feed-In Tariff for Renewable Energy Generation Facilities), Effective January 1, 2011; (2) Closing Schedule D-T-O-U (Domestic Time-Of-Use Service) (Effective Upon City Council Approval); (3) Adopting A Revised Electric Rule 10, "Distribution System Additions," and Electric Rule 11 "Electric Service Facilities," Effective 60 Days From Date of Approval by City Council; (4) Making Findings of Fact; and (5) Directing Staff to File Notice of Exemption, was presented and adopted.	Motion Second All Ayes				X			X

LEGISLATIVE REPORTS
There was nothing to report on the League of California Cities - City Advocate Weekly dated December 3, 2010, and the State Budget.

ITEMS FOR FUTURE CITY COUNCIL CONSIDERATION
There were no items for future consideration.

The City Council adjourned at 9:31 p.m.

Respectfully submitted,

COLLEEN J. NICOL
City Clerk

THE PRESS-ENTERPRISE

CLASSIFIED ADVERTISING PROOF

Printed by: Tinajero, Maria
at: 2:32 pm
on: Wednesday, Dec 15, 2010

Ad #: 10497339

3450 Fourteenth St.
Riverside, CA 92501-3878
1-800-880-0345
951-684-1200
951-368-9018 Fax

Account Information

Phone #:	(951) 826-5557
Name:	RIVERSIDE CITY CLERK
Address:	3900 MAIN ST RIVERSIDE CA 92522
Acct #:	044653
Client:	
Placed by:	Laura Martinez
Fax #:	(951) 826-5470

Ad Information

Classification:	Legals
Publications:	Press-Enterprise
Start date:	**12-17-10**
Stop date:	**12-17-10**
Insertions:	1
Rate code:	LE-City
Ad type:	Ad Liner
Taken by:	Tinajero, Maria
Size:	2x107.390
Bill size:	215.00x 5.14 agate lines
Amount due:	**$236.50**

Ad Copy:

RESOLUTION NO. 22140
A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF RIVERSIDE, CALIFORNIA, OF INTENT TO DRAFT A GROUNDWATER MANAGEMENT PLAN FOR THE RIVERSIDE GROUNDWATER BASIN

WHEREAS, the City of Riverside ("City") is a California charter city and municipal corporation that provides water service to all or a portion of the Riverside Groundwater Basin ("Basin"), a basin which is not subject to groundwater management pursuant to other provisions of law or a court order, judgment or decree; and

WHEREAS, in 1992, the California Legislature enacted Assembly Bill 3030 to provide local public agencies increased management authority over their groundwater resources and subsequently enacted Senate Bill 1938 to encourage local public agencies to adopt groundwater management plans in order to increase their eligibility for grant funds for groundwater related projects (Water Code section 10750); and

WHEREAS, the Legislature has also declared that the additional study of groundwater resources is necessary to better understand how to manage groundwater effectively to ensure the safe production, quality, and proper storage of groundwater in the State; and

WHEREAS, the adoption of a groundwater management plan is encouraged, but not required, by law; and

WHEREAS, on December 19, 2008, the City adopted a resolution of intention to draft a groundwater management plan for the Basin; and

WHEREAS, Government Code section 10753.4 provides that if the City fails to prepare and adopted a groundwater management plan within two years of the date of the resolution of intent, that resolution expires and the City must adopt a new resolution of intent; and

WHEREAS, the City will not be able to complete its groundwater management plan for the Basin prior to the two-year expiration of the December 19, 2008, resolution of intent, and therefore intends to adopt a new resolution of intent; and

WHEREAS, prior to adopting a resolution of intention to draft a groundwater management plan, Water Code section 10753.2 requires a local agency to hold a hearing, after publication of notice pursuant to Government Code Section 6066, on whether or not to adopt a resolution of intention to draft a groundwater management plan; and

WHEREAS, pursuant to Government Code Section 6066, the City duly published notice of a public hearing before the City's Board of Public Utilities on whether or not to adopt a resolution of intention to draft a groundwater management plan for the Basin; and

WHEREAS, the Board of Public Utilities conducted such public hearing on Friday, November 17, 2010 at 8:30 AM in the Riverside Public Utilities Board Room, 3901 Orange Street, Riverside, California.

NOW, THEREFORE, BE IT RESOLVED by the City Council of the City of Riverside, California, as follows:

Section 1: To adopt a resolution of intention to draft a groundwater management plan for the Riverside Basin in accordance with the provisions of Water Code sections 10750 et seq.

Section 2: Direct the City Clerk to publish the Resolution of Intention under Government Code Section 6066 pursuant to Water Code Section 10753.3(a).

Section 3: Direct staff to prepare a groundwater management plan for the Riverside Basin by December 2012 in accordance with Water Code sections 10750 et seq.

ADOPTED by the City Council this 14th day of December, 2010.

RONALD O. LOVERIDGE
Mayor of the City of Riverside

Attest:

COLLEEN J. NICOL
City Clerk of the City of Riverside

I, Colleen J. Nicol, City Clerk of the City of Riverside, California, hereby certify that the foregoing resolution was duly and regularly adopted at a meeting of the City Council of said City at its meeting held on the 14th day of December, 2010, by the following vote, to wit:

Ayes: Councilmembers Gardner, Melendrez, Bailey, Davis, Mac Arthur, Hart, and Adams
Noes: None
Absent: None
Disqualified: None

IN WITNESS WHEREOF, I have hereunto set my hand and affixed the official seal of the City of Riverside, California, this 15th day of December, 2010.

COLLEEN J. NICOL
City Clerk of the City of Riverside

12/17

Council this 16th day of December, 2008.
RONALD O. LOVERIDGE
Mayor of the City of Riverside
ATTEST:
COLLEEN J. NICOL
City Clerk of the City of Riverside

I, Colleen J. Nicol, City Clerk of the City of Riverside, California, hereby certify that the foregoing resolution was duly and regularly introduced and adopted at a meeting of the City Council of said City at its meeting held on the 16th day of December, 2008, by the following vote, to wit:
Ayes: Councilmembers Gardner, Melendrez, Bailey, Schiavone, Mac Arthur, Hart, and Adams
Noes: None
Absent: None
Abstain: None

IN WITNESS WHEREOF, I have hereunto set my hand and affixed the official seal of the City of Riverside, California, this 19th day of December, 2008.
COLLEEN J. NICOL
City Clerk of the City of Riverside 12/26, 1/2

RECEIVED
JAN 12 2009
City of Riverside
City Clerk's Office

THE PRESS-ENTERPRISE

CLASSIFIED ADVERTISING PROOF

Printed by: Tinajero, Maria
at: 12:18 pm
on: Tuesday, Dec 21, 2010

Ad #: 10503132

3450 Fourteenth St.
Riverside, CA 92501-3878
1-800-880-0345
951-684-1200
951-368-9018 Fax

Account Information

Phone #:	(951) 826-5557
Name:	RIVERSIDE CITY CLERK
Address:	3900 MAIN ST RIVERSIDE CA 92522
Acct #:	044653
Client:	
Placed by:	Laura Martinez
Fax #:	(951) 826-5470

Ad Information

Classification:	Legals
Publications:	Press-Enterprise
Start date:	**12-24-10**
Stop date:	**12-24-10**
Insertions:	1
Rate code:	LE-City
Ad type:	Ad Liner
Taken by:	Tinajero, Maria
Size:	2x107.000
Bill size:	214.00x 5.14 agate lines
Amount due:	**$235.40**

Ad Copy:

RESOLUTION NO. 22140

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF RIVERSIDE, CALIFORNIA, OF INTENT TO DRAFT A GROUNDWATER MANAGEMENT PLAN FOR THE RIVERSIDE GROUNDWATER BASIN

WHEREAS, the City of Riverside ("City") is a California charter city and municipal corporation that provides water service to all or a portion of the Riverside Groundwater Basin ("Basin"), a basin which is not subject to groundwater management pursuant to other provisions of law or a court order, judgment or decree; and

WHEREAS, in 1992, the California Legislature enacted Assembly Bill 3030 to provide local public agencies increased management authority over their groundwater resources and subsequently enacted Senate Bill 1938 to encourage local public agencies to adopt groundwater management plans in order to increase their eligibility for grant funds for groundwater related projects (Water Code section 10750); and

WHEREAS, the Legislature has also declared that the additional study of groundwater resources is necessary to better understand how to manage groundwater effectively to ensure the safe production, quality, and proper storage of groundwater in the State; and

WHEREAS, the adoption of a groundwater management plan is encouraged, but not required, by law; and

WHEREAS, on December 19, 2008, the City adopted a resolution of intention to draft a groundwater management plan for the Basin; and

WHEREAS, Government Code section 10753.4 provides that if the City fails to prepare and adopted a groundwater management plan within two years of the date of the resolution of intent, that resolution expires and the City must adopt a new resolution of intent; and

WHEREAS, the City will not be able to complete its groundwater management plan for the Basin prior to the two-year expiration of the December 19, 2008, resolution of intent, and therefore intends to adopt a new resolution of intent; and

WHEREAS, prior to adopting a resolution of intention to draft a groundwater management plan, Water Code section 10753.2 requires a local agency to hold a hearing, after publication of notice pursuant to Government Code Section 6066, on whether or not to adopt a resolution of intention to draft a groundwater management plan; and

WHEREAS, pursuant to Government Code Section 6066, the City duly published notice of a public hearing before the City's Board of Public Utilities on whether or not to adopt a resolution of intention to draft a groundwater management plan for the Basin; and

WHEREAS, the Board of Public Utilities conducted such public hearing on Friday, November 17, 2010 at 8:30 AM in the Riverside Public Utilities Board Room, 3901 Orange Street, Riverside, California.

NOW, THEREFORE, BE IT RESOLVED by the City Council of the City of Riverside, California, as follows:

Section 1: To adopt a resolution of intention to draft a groundwater management plan for the Riverside Basin in accordance with the provisions of Water Code sections 10750 et seq.

Section 2: Direct the City Clerk to publish the Resolution of Intention under Government Code Section 6066 pursuant to Water Code Section 10753.3(a).

Section 3: Direct staff to prepare a groundwater management plan for the Riverside Basin by December 2012 in accordance with Water Code sections 10750 et seq.

ADOPTED by the City Council this 14th day of December, 2010.

RONALD O. LOVERIDGE
Mayor of the City of Riverside

Attest:
COLLEEN J. NICOL
City Clerk of the City of Riverside

I, Colleen J. Nicol, City Clerk of the City of Riverside, California, hereby certify that the foregoing resolution was duly and regularly adopted at a meeting of the City Council of said City at its meeting held on the 14th day of December, 2010, by the following vote, to wit:

Ayes: Councilmembers Gardner, Melendrez, Bailey, Davis, Mac Arthur, Hart, and Adams
Noes: None
Absent: None
Disqualified: None

IN WITNESS WHEREOF, I have hereunto set my hand and affixed the official seal of the City of Riverside, California, this 15th day of December, 2010.

COLLEEN J. NICOL
City Clerk of the City of Riverside

12/24

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APPENDIX B – GEOLOGIC CROSS-SECTIONS

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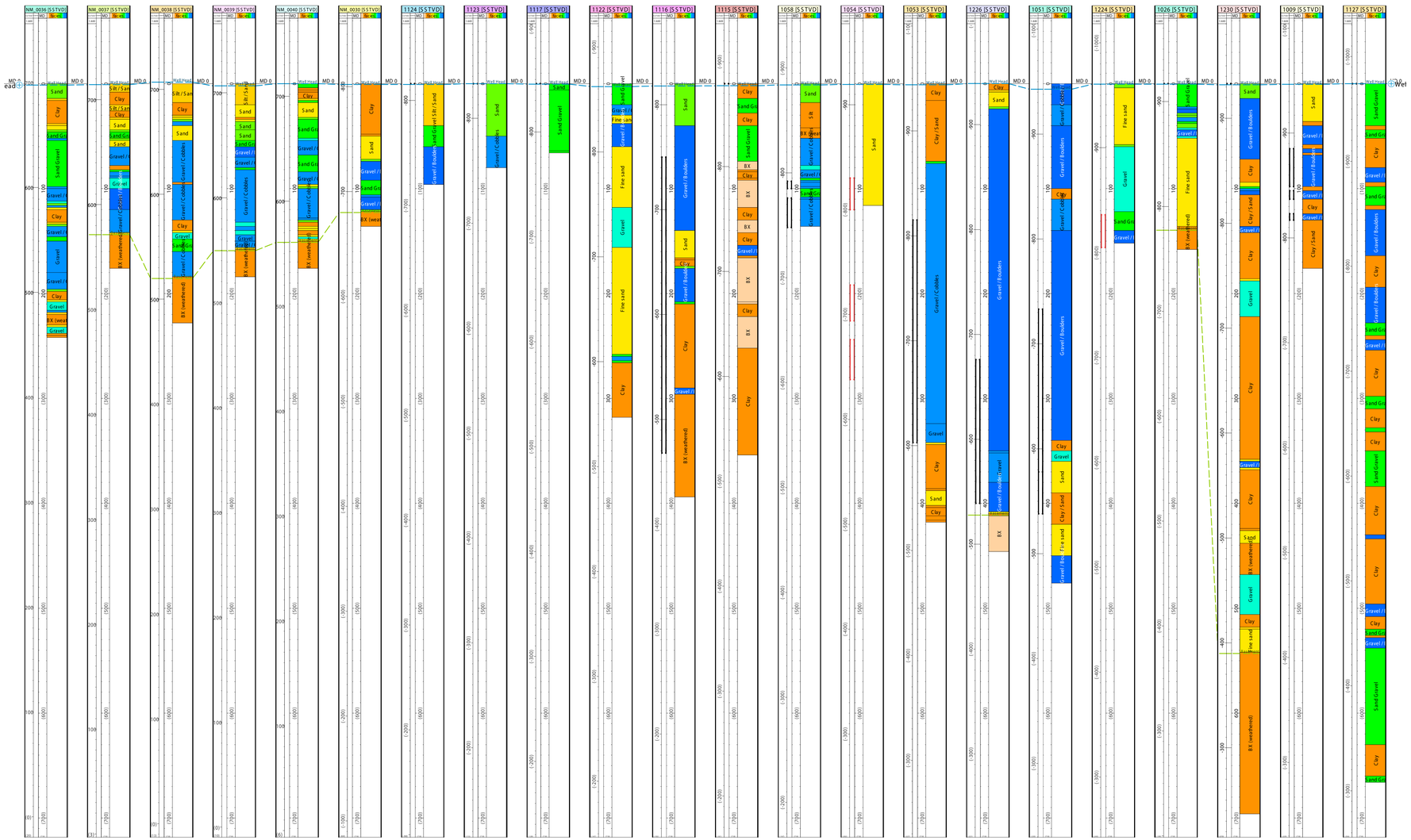
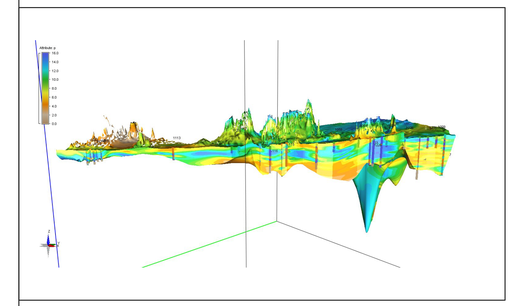
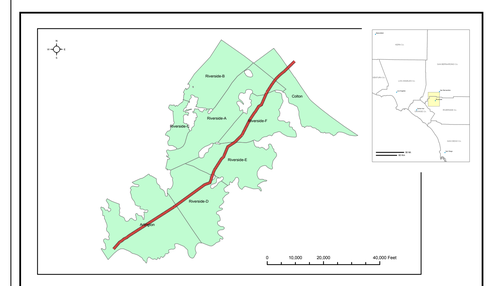
Western Municipal Water District

Geologic cross-sections and 3D lithologic model, Riverside and Arlington Basins

Lithologic Cross - Section A-A'
Figure 1







LEGEND

LITHOLOGY

- gravel (p = 16)
- sand
- silt
- clay
- weathered bedrock
- bedrock (p = 2)

DRAFT COPY

Notes:
- SSTVD is Sub-sea True Vertical Depth.
- MD = Measured Drill Depth
- Vertical Exaggeration 10X

WESTERN MUNICIPAL WATER DISTRICT

Western Municipal Water District

Geologic cross-sections and 3D lithologic model, Riverside and Arlington Basins

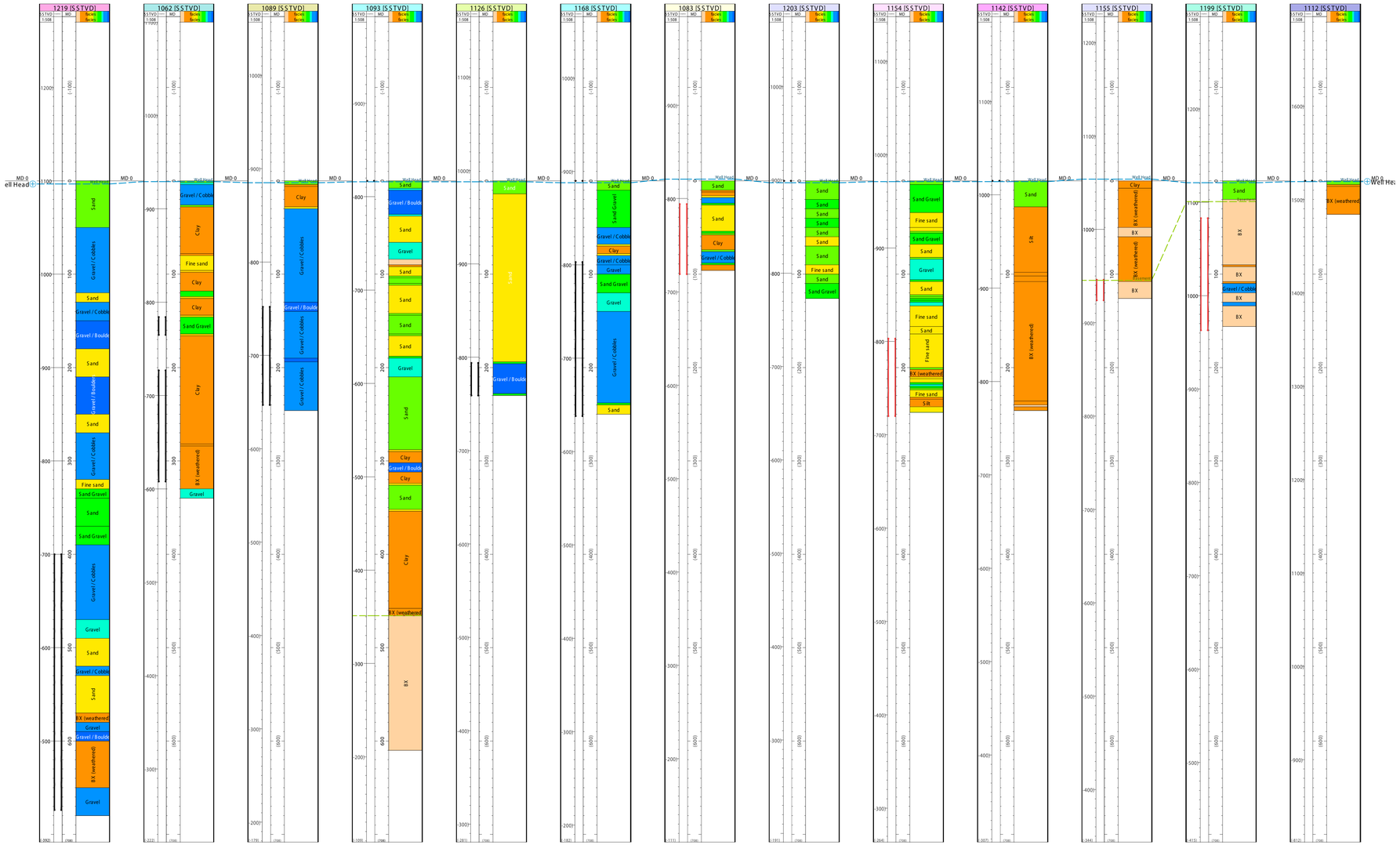
Lithologic cross - section F-F'

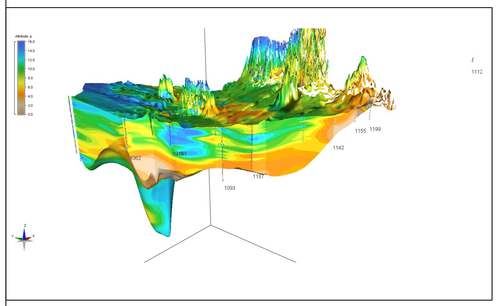
Prepared by:
Numeric Solutions LLC
Geoinformatic Management
www.numericsolutions.com

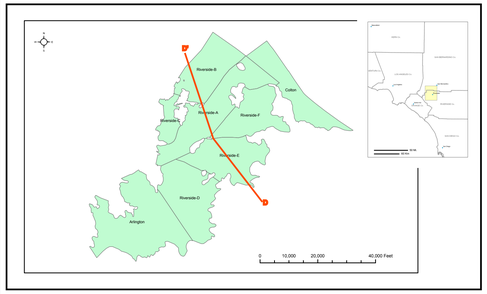
Western Municipal Water District

Geologic cross-sections and 3D lithologic model, Riverside and Arlington Basins

Lithologic Cross - Section D-D'
Figure 4







LEGEND

LITHOLOGY

- gravel (p = 16)
- sand
- silt
- clay
- weathered bedrock
- bedrock (p = 2)

DRAFT COPY

Notes:
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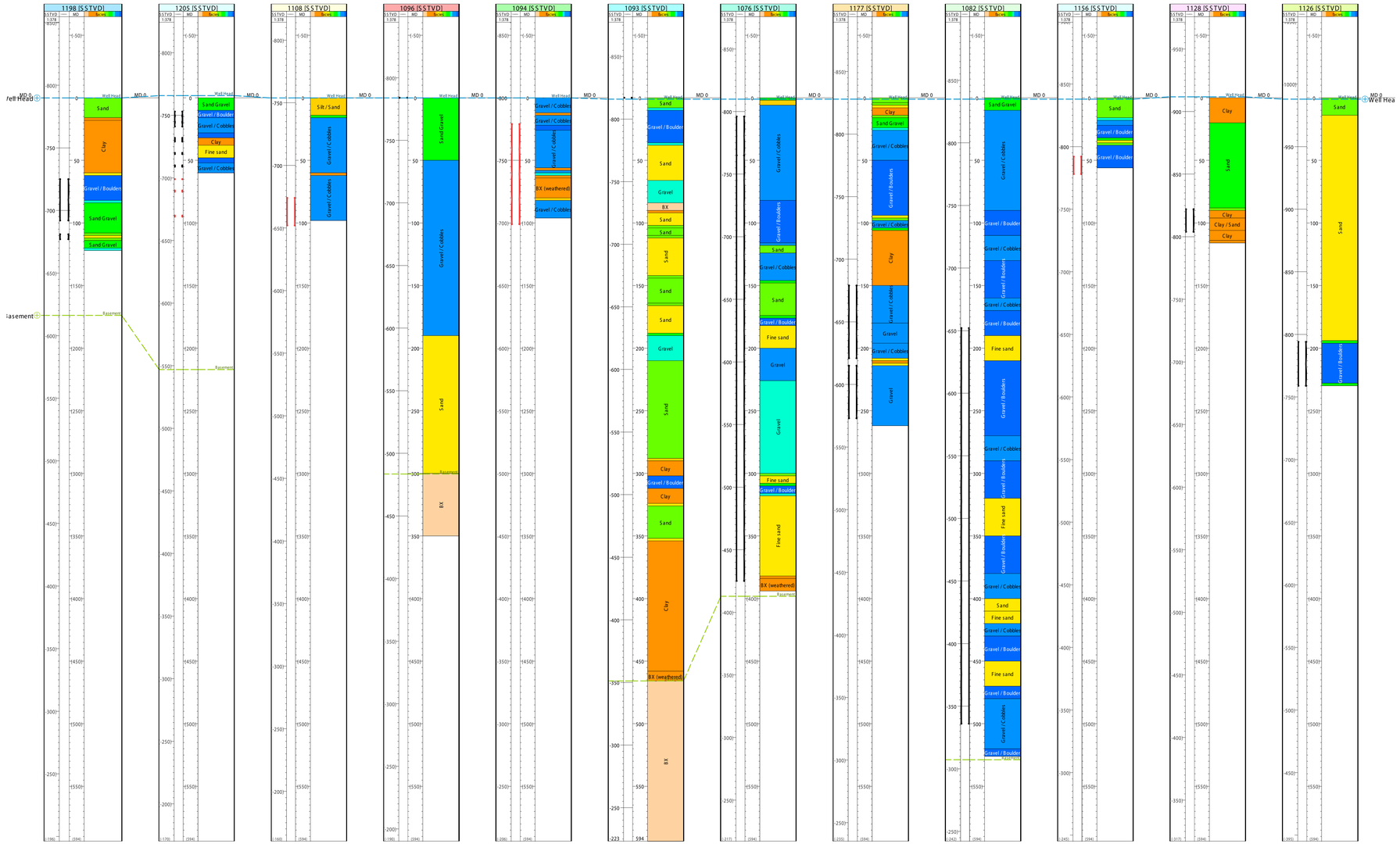
WESTERN MUNICIPAL WATER DISTRICT

Western Municipal Water District

Geologic cross-sections and 3D lithologic model, Riverside and Arlington Basins

Lithologic cross - section F-F'

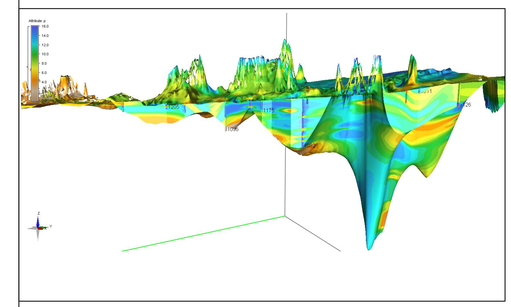
Prepared by:
Numeric Solutions LLC
Geoinformation Management
www.numericsolutions.com

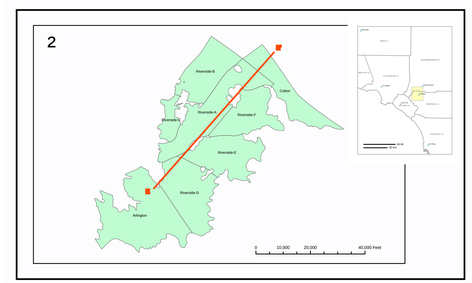


Western Municipal Water District

Geologic cross-sections and 3D lithologic model, Riverside and Arlington Basins

Lithologic Cross - Section E-E'
Figure 6





LEGEND

LITHOLOGY

- gravel (p = 16)
- sand
- silt
- clay
- weathered bedrock
- bedrock (p = 2)

DRAFT COPY

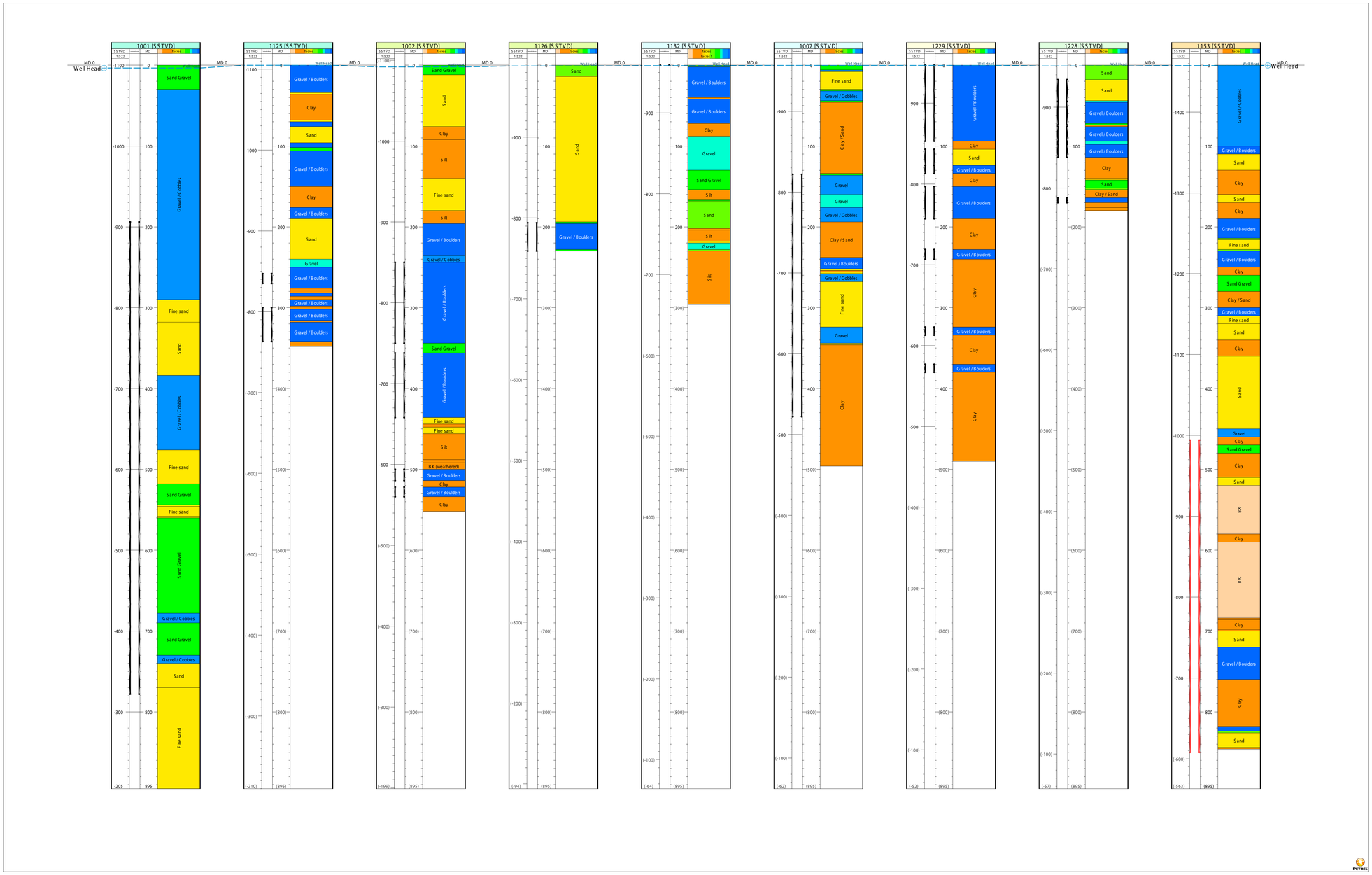
Notes:
- SSTVD is Sub-sea True Vertical Depth.
- MD = Measured Drill Depth
- Vertical Exaggeration 10X

Western Municipal Water District

Geologic cross-sections and 3D lithologic model, Riverside and Arlington Basins

Lithologic cross - section F-F'

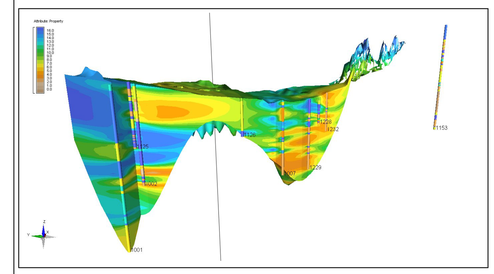
Prepared by:
Numeric Solutions LLC
Water Resources Management
www.numericsolutions.com



Western Municipal Water District

Geologic cross-sections and 3D lithologic model, Riverside and Arlington Basins

Lithologic Cross - Section F-F'
Figure 7



LEGEND

LITHOLOGY

- gravel (p = 16)
- sand
- silt
- clay
- weathered bedrock
- bedrock (p = 2)

DRAFT COPY

Notes:
- SSTVD is Sub-sea True Vertical Depth.
- MD = Measured Drill Depth
- Vertical Exaggeration 10X

WESTERN MUNICIPAL WATER DISTRICT

Western Municipal Water District

Geologic cross-sections and 3D lithologic model, Riverside and Arlington Basins

Lithologic cross - section F-F'

Prepared by: **Numeric Solutions LLC**
Geoinformatics Manager
www.NumericSolutions.com

APPENDIX C – CONSUMER CONFIDENCE REPORTS

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City of Colton
Colton Utility Department
160 South 10th Street
Colton, CA 92324

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COLTON

Public Utilities

RESIDENTIAL CUSTOMER

Consumer Confidence Report

WATER CONSERVATION TIPS

- Take short showers-a 5 minute shower uses 4 to 5 gallons of water compared to up to 50 gallons for a bath.
- Shut off water while brushing your teeth, washing your hair and shaving and save up to 500 gallons a month.
- Use water efficient showerheads. They are inexpensive and can save you up to 750 gallons a month.
- Use your clothes and dishwasher only when they are full. You can save up to 1,000 gallons a month.
- Water plants only when necessary. Water during cooler parts of the day to reduce evaporation.
- Fix leaky toilets and faucets. Place a few drops of food coloring in the toilet tank, if it seeps into the bowl without flushing, you have a leak. Fixing it or replacing it with a new, efficient model can save up to 1,000 gallons a month.

WATER PROTECTION TIPS

- Eliminate excess use of lawn and garden fertilizers and pesticides – they contain hazardous chemicals that can reach your drinking water source.
- Pick up after your pets.
- If you have a septic system, properly maintain the system to reduce leaching to water sources or consider connecting to the public water system.
- Dispose of chemicals properly; take used motor oil to a recycling center.

CITY OF COLTON WATER DEPARTMENT
Consumer Confidence Report for 2010

Estimado cliente –
Este informe contiene información muy importante sobre su agua potable. Por favor encuentre alguien que se lo pueda traducir.

Introduction

The City of Colton Water Department is pleased to present the latest Consumer Confidence Report. This report is designed to keep you informed about the quality of water and services that, through our efforts, are delivered to you every day. We are committed to ensuring the quality of your water. Our constant and main goal is to provide you with a safe and dependable supply of drinking water. We want to help you understand the measures we continuously take to improve the water treatment process and protect the water system resources. These resources consist of thirteen (13) wells, which draw water from three (3) underlying groundwater basins (Colton/Rialto Basin, Bunkerhill Basin and North Riverside Basin). Another source, if needed, is the City of San Bernardino's water supply, which is treated groundwater from the Bunkerhill Basin.

Assessment Information

In September 2002, an assessment was completed of the drinking water from all sources to the City. The report is a vulnerability assessment of potential sources of contaminants for each water source. If you would like to request a summary of the assessments, please contact John Ahearn, City of Colton Water Quality Specialist, at (**909- 370-6164**).

Routine Water Testing / Ensuring Tap Water Safety

City of Colton Water Department staff routinely monitor the drinking water for contaminants. These tests are conducted according to Federal and State laws/regulations. On the following page, you will find a Monitoring Table showing the results for the period covering January 1 to December 31, 2010.

In order to ensure that tap water is safe to drink, the U.S. Environmental Protection Agency (EPA) and the State Department of Public Health (CDPH) prescribe regulations that limit the amount of certain contaminants in water that is provided by public water systems. The same protection is provided by CDPH regulations that establish limits for contaminants in bottled water.

Common Contaminants

Sources of drinking water (both tap & bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally-occurring minerals and, in some cases, radioactive material, and can pick up substances resulting from the presence of animals or human activity. Contaminants that may be present in source water before we treat it include:

- **Microbial contaminants,** such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations and wildlife.
- **Inorganic contaminants,** such as salts and metals, which can be naturally-occurring or result from urban stormwater runoff, industrial or domestic wastewater discharges, oil and gas production, mining or farming.
- **Pesticides and herbicides,** which may come from a variety of sources such as agriculture or residential uses.
- **Radioactive contaminants,** which can be naturally-occurring or be the result of oil and gas production and mining activities.
- **Organic chemical contaminants,** including synthetic and volatile organic chemicals, which are byproducts of industrial processes and petroleum production, and can also come from gas stations, urban stormwater runoff, and septic systems.

Obtaining Contaminant Information

All drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate the water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the Environmental Protection Agency's Safe Drinking Water Hotline (**1-800-426-4791**).

Possible Vulnerability

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons with cancer who are undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly persons, and infants can be particularly at risk of infection. If any of these apply to you, please seek advice from your health care provider regarding the drinking of water. US EPA/CDC guidelines on appropriate means to lessen the risk of infection from Cryptosporidium and other microbiological contaminants are available from the Safe Drinking Water Hotline (**1-800-426-4791**).

Effects of Radon

Radon is a radioactive gas that one cannot see, taste or smell. Radon can move up through the ground and into a home through the cracks and holes in the foundation. Radon can build up to high levels in all types of homes. Radon can also enter indoor air when released from tap water during showering, washing dishes, and other household activities. Compared to Radon entering the home through soil, in most cases it will be a small source of Radon entering the home through tap water use. Radon can lead to lung cancer. Drinking water containing Radon may also cause increased risk of stomach cancer. You can test the air in your home if you are concerned. Testing is inexpensive and easy. Should the level of Radon in your home be 4 picocuries per liter of air (pCi/L) or higher, there are simple ways to fix it that are not too costly. For additional information, call the State Radon Program office or EPA's Radon Hotline (**1-800-SOS-RADON**).

Effects of Nitrate

Nitrate levels may rise quickly for short periods of time because of rainfall or agricultural activity. Nitrate in drinking water at levels above 45 mg/L is a health risk for infants of less than six months of age. Such nitrate levels in drinking water can interfere with the capacity of the infant's blood to carry oxygen, resulting in serious illness; symptoms include; shortness of breath and blueness of the skin. Nitrate levels above 45 mg/L may also affect the ability of the blood to carry oxygen in other individuals, such as pregnant women and those with certain specific enzyme deficiencies. If you are caring for an infant(s), or if you are pregnant, please seek advice from your health care provider.

Effects of Perchlorate

The Dept. of Public Health set the Maximum Contaminate Level (MCL) for Perchlorate at 6 ppb. As a result, the City of Colton has completed installation of two (2) treatment systems for three (3) wells that were impacted by this new level. These systems remove perchlorate to below detection levels, ensuring that the water served never exceeds the State MCL. Drinking water containing Perchlorate in excess of the MCL may cause effects associated with hypothyroidism. Perchlorate interferes with the production of thyroid hormones, which are required for normal pre-/postnatal development in humans, as well as normal body metabolism.

CITY OF COLTON WATER DEPARTMENT
Consumer Confidence Report for 2010

Effects of Lead

If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. The City of Colton is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available to the Safe Drinking Water Hotline or at hppt://www.epa.gov/safewater/lead.

Contacts Regarding Questions or Concerns

If you have any questions concerning your water quality or about this report, please contact John Ahearn, Water Quality Specialist for the City of Colton **(909-370-6164)**. For more information, please visit the City's website at **http://www.ci.colton.ca.us, City Departments, Public Utilities**. The City Council Meeting Agendas/Minutes are also accessible on the website and contain detailed reports of some of the information offered here. You can also attend Utilities Commission Meetings held every second Monday of the month (except October and November, when they are held on the third Monday) at City Hall.

YOUR WATER IS SAFE!

The City of Colton is proud that your drinking water meets or exceeds all Federal and State requirements. Though we have learned through monitoring and testing that some contaminants have been detected, the EPA has determined that your water IS SAFE at these levels. Please refer to the following page, which shows that the City's water system did not have any violations.

Key to Abbreviations and Footnotes

AL Action Levels are health-based advisory levels for chemicals in drinking water for which there are no formal regulatory standards or MCL's.
N/A Not Applicable **NC** Non – Corrosive **ND** Monitored but not detected **NS** No Standard has been set
NTU Nephrelometric Turbidity Units, a measure of suspended material in water **pCi/L** PicoCuries per liter, a measure of radioactivity
mg/l Milligrams per liter, or parts per million **ug/l** Micrograms per liter, or parts per billion **TON** Threshold Odor Number
TT Treatment Technique (See Definitions) **Umhos** Micromhos, a measure of total mineral content < Less than *The State allows for less than annual monitoring for certain constituents because the concentrations do not change frequently. Therefore, the data, though representative, is more than a year old. ** A positive Langlier Index indicates that the water is non – corrosive
*** An aggressiveness index greater than 10 indicates that the water is not aggressive (corrosive) **** For systems collecting 40 or more samples, if more than 5.0 percent of samples collected are total coliform positive, then the MCL is violated.

Definitions

Public Health Goal

The level of contaminant in drinking water below which there is no known or expected health risks. PHG's are set by the California Environmental Protection Agency.

Maximum Contaminant Level (MCL)

The highest level of a contaminant that is allowed in drinking water. Primary MCL's are set as close to PHG's (or MCLG's) as is technologically and economically feasible. Secondary MCL's are set to protect the odor, taste, and appearance of drinking water.

Primary Drinking Water Standards

MCL's for contaminants that affect health, along with their monitoring and reporting requirements, and water treatment requirements.

A required process intended to reduce the level of a contaminant in drinking water

Maximum Residual Disinfectant Level (MRDL)

The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for the control of microbial contaminants.

Maximum Residual Disinfectant Level Goal (MRDLG)

The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for the control of microbial contaminants.

Water Quality Terms

Clarity

Cloudiness or turbidity in water is caused by tiny particles such as clay, silt or other suspended mater. Clarity is regulated because minute particles can shield bacteria from the disinfection process.

Radionuclides

Radioactivity in water originates from both natural sources and human activities. In most low risk areas, potential exposure to radiation in water is a fraction of the background exposure from all other natural sources.

Primary Standards

Were established to protect the consumer from health hazards associated with bacteria and chemicals.

Secondary Standards

The measure of aesthetic qualities such as taste, odor and color, which do not affect health.

CITY OF COLTON - WATER DEPARTMENT

MONITORING TABLE FOR JANUARY 1 - DECEMBER 31, 2010

Contaminant	Violation Y / N	TEST RESULTS Minimum	Maximum	Average	UNIT MEASURE	STATE MCL / MRDL	STATE PHG / MRDLG	YEAR TESTED*	LIKELY SOURCE OF CONTAMINANT
INORGANIC CHEMICALS - PRIMARY STANDARDS									
Fluoride	N	0.31	0.69	0.45	mg/l	2	1	2010	Erosion of natural deposits, water additive for dental hygiene, discharge from fertilizer and aluminum factories
Nitrate (as NO3)	N	0	31	11	mg/l	45	45	2010	Runoff / leaching from fertilizer use, septic tanks, sewage, and erosion of natural deposits
Nitrate+Nitrite as Nitrogen	N	0	0.71	0.23	mg/l	1	1	2009	Runoff / leaching from fertilizer use, septic tanks, sewage, and erosion of natural deposits
CHEMICAL PARAMETERS - SECONDARY STANDARDS									
Chloride	N	6.5	70	19	mg/l	500	NS	2010	Runoff / leaching from natural deposits; seawater influence
Corrosivity (Langlier Index)**	N	-0.75	0.47	0.15	units	NC	NS	2009	Natural or industrial-influenced balance of hydrogen, carbon & oxygen in water, affected by temperature and other factors.
Aggressiveness Index ***	N	11	12	12	units	NS	NS	2009	
Iron	N	0	320	38	ug/l	300	NS	2010	Leaching from natural deposits
Manganese	N	0	63	15	ug/l	50	NS	2010	Leaching from natural deposits
Specific Conductance	N	400	820	516	umhos	1600	NS	2010	Substances that form ions in water; seawater influence
Sulfate	N	24	88	50	mg/l	500	NS	2010	Runoff / leaching from natural deposits, industrial wastes
Total Dissolved Solids	N	240	520	328	mg/l	1000	NS	2010	Runoff / leaching from natural deposits
PHYSICAL PARAMETERS									
Odor - Threshold	N	1	2	1	TON	3	NS	2009	Naturally occurring organic materials
pH	N	8	8	8	units	NS	NS	2010	
Turbidity	N	0	1.6	0.27	NTU	5	N/A	2009	Turbidity is monitored because it is a good indicator of water quality. High turbity can hinder disinfectant effectiveness.
RADIONUCLIDES									
Gross Alpha Particle Activity	N	1.4	1.9	1.6	pCi/L	15	NS	2009	Erosion of natural deposits
Radon 222	N	229	458	333.3	pCi/L	NS	NS	2000	Erosion of natural deposits
Uranium	N	0	5.1	0.46	pCi/L	20	0.43	2010	Erosion of natural deposits
VOLATILE ORGANIC CHEMICALS (VOC's)									
Tetrachloroethylene	N	ND	ND	ND	ug/l	5	0.06	2010	Leaching from PVC pipes, discharge from factories, dry cleaners and auto shops (metal degreaser)
ADDITIONAL PARAMETERS									
Alkalinity	N	140	210	180	mg/l	NS	NS	2010	
Bicarbonate Alkalinity	N	180	260	219	mg/l	NS	NS	2010	
Calcium	N	33	95	63	mg/l	NS	NS	2010	
Total Hardness	N	120	280	196	mg/l	NS	NS	2010	
Magnesium	N	7	15	11	mg/l	NS	NS	2010	
Potassium	N	2	4	3	mg/l	NS	NS	2010	
Sodium	N	13	140	35	mg/l	NS	NS	2010	
Boron	N	0	200	31	mg/l	NS	NS	2010	
DISTRIBUTION SYSTEM									
Microbiological-Total Coliform Bacteria	N	ND	ND	ND	Presense of coliform bacteria in 5% of monthly samples****			2010	Nauturally present in the environment
Total Trihalomethanes	N	0	15	7.6	ug/l	80	NS	2010	By-product of drinking water chlorination
Haloacetic Acids	N	0	1.5	1	ug/l	60	NS	2010	By-product of drinking water chlorination
Chlorine	N	0.58	0.85	0.67	mg/l	4	4	2010	Drinking water disinfectant added for treatment
REGULATED CONTAMINANTS(Perchlorate)									
Perchlorate	N	0	6.4	0.9	ug/l	6	6	2010	Component of explosives,fireworks,matches,and solid rocket fuels.

LEAD AND COPPER

The Lead & Copper Rule became effective in 1993. The City of Colton has performed seven rounds of sampling. The last round was performed in August 2010. Next round is scheduled for 2013. All samples are taken from the first draw of morning water. The first two rounds were from 60 single-family residences with copper pipe with lead solder installed since 1982. The 1998, 2001, 2004,2007 & 2010 sampling included only 30 single-family residences due to favorable results in the previous sampling rounds. The next round is scheduled for August 2013. The 2010 results were:

Contaminant	90th Percentile Result	Unit Measurement	MCL	PHG	LIKELY SOURCE OF CONTAMINANT
LEAD	5	ug/l	AL 15	2	Internal corrosion of household plumbing systems, discharge from industrial mfg, erosion of natural deposits
COPPER	180	ug/l	AL 1300	300	Internal corrosion of household plumbing systems, erosion of natural deposits.

Jurupa
COMMUNITY SERVICES DISTRICT
11201 Harrel Street
Mira Loma, CA 91752

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2010 Consumer Confidence Report

INFORMATION ABOUT YOUR DRINKING WATER

JURUPA COMMUNITY SERVICES DISTRICT – (951) 685-7434 – WWW.JCSD.US

JCSD holds regular Board Meetings on the second and fourth Monday of each month at the Main Office located at 11201 Harrel Street, Mira Loma, at 7:00 p.m.
For more information contact the Administration Department at: (951) 685-7434.

Food for thought: A running toilet can waste up to 200 gallons of water per day.

Hydrant Flushing

Golf Booster Station

We test the drinking water quality for many constituents as required by State and Federal Regulations.

This report shows the results of our monitoring for the period of January 1, 2010 - December 31, 2010.

Last year, as in years past, your metered tap water met all U.S. EPA and State Drinking Water Health Standards.

Este informe contiene información muy importante sobre su agua de beber. Tradúzcalo ó hable con alguien que lo entienda bien.

All water delivered in 2010 was produced from wells.

- JCSD wells are located near Interstate 15 and Highway 60
- Chino I Desalter wells are located in Chino near Chino Airport
- Rubidoux wells are located in Rubidoux
- Roger Teagarden Ion Exchange Treatment Plant is located near Interstate 15 and Highway 60
- Chino II Desalter wells are located near Interstate 15 and Bellegrave

The sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs and wells. As water travels over the surface of the land or through the ground, it dissolves naturally occurring minerals and in some cases, radioactive material, and can pick up substances resulting from the presence of animals or from human activity.

In order to ensure that tap water is safe to drink, the U.S. Environmental Protection Agency (USEPA) and the State Department of Public Health (Department) prescribe regulations that limit the amount of certain contaminants in water provided by public water systems. Department regulations also establish limits for contaminants in bottled water that provide the same protection for public health.

Tables 1, 2, 3, 4, 5 and 6 list all of the drinking water contaminants that were detected during the most recent sampling for the constituent. The presence of these contaminants in the water does not necessarily indicate that the water poses a health risk. The Department requires all water systems to monitor for certain contaminants less than once per year because the concentrations of these contaminants are not expected to vary significantly from year to year. Some of the data, though representative of the water quality, are more than a year old.

Terms Used In This Report

Maximum Contaminant Level (MCL): The highest level of a contaminant that is allowed in drinking water. Primary MCLs are set as close to the PHGs (or MCLGs) as is economically and technologically feasible. Secondary MCLs are set to protect the odor, taste, and appearance of drinking water.

Maximum Contaminant Level Goal (MCLG): The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs are set by the U.S. Environmental Protection Agency.

Maximum Residual Disinfectant Level (MRDL): The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.

Maximum Residual Disinfectant Level Goal (MRDLG): The level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.

Primary Drinking Water Standard (PDWS): MCLs and MRDLs for contaminants that affect health along with their monitoring and reporting requirements and water treatment requirements.

Public Health Goal (PHG): The level of a contaminant in drinking water below which there is no known or expected risk to health. PHGs are set by the California Environmental Protection Agency.

Regulatory Action Level (AL): The concentration of a contaminant, which, if exceeded, triggers treatment or other requirements that a water system must follow.

Secondary Drinking Water Standards (SDWS): MCLs for contaminants that affect taste, odor, or appearance of the drinking water. Contaminants with SDWSs do not affect health at the MCL levels.

Additional General Information On Drinking Water

Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the U.S. Environmental Protection Agency (U.S. EPA's) Safe Drinking Water Hotline (1-800-426-4791).

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. U.S. EPA/Centers for Disease Control (CDC) guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* and other microbial contaminants are available from the Safe Drinking Water Hotline (1-800-426-4791).

Nitrate in drinking water at levels above 45 mg/L is a health risk for infants of less than six months of age. Such nitrate levels in drinking water can interfere with the capacity of the infant's blood to carry oxygen, resulting in serious illness; symptoms include shortness of breath and blueness of the skin (methemoglobinemia or Blue-Baby Syndrome). Nitrate levels above 45 mg/L may also affect the ability of the blood to carry oxygen in other individuals, such as pregnant women and those with certain specific enzyme deficiencies. If you are caring for an infant or you are pregnant, you should ask advice from your health care provider.

If lead in drinking water is present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. Jurupa Community Services District is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline or at:
http://www.epa.gov/safewater/lead.

California Department of Public Health Fluoridation website link: www.cdph.ca.gov/certlic/drinkingwater/Pages/Fluoridation.aspx

Contaminants that may be present in source water include:

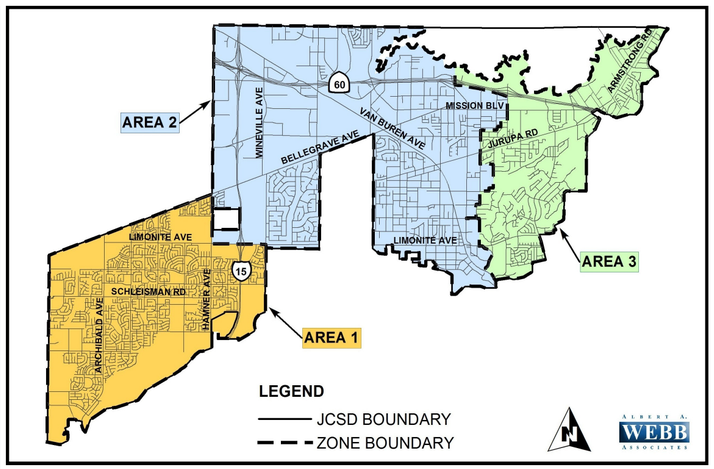
Microbial contaminants, such as viruses and bacteria that may come from sewage treatment plants, septic systems, agricultural livestock operations and wildlife.

Inorganic contaminants, such as salts and metals that can be naturally occurring or result from urban storm water runoff, industrial or domestic wastewater discharges, oil and gas production, mining or farming.

Pesticides and herbicides, that may come from a variety of sources such as agriculture, urban storm water runoff and residential uses.

Organic chemical contaminants, including synthetic and volatile organic chemicals that are byproducts of industrial processes and petroleum production and can also come from gas stations, urban stormwater runoff, agricultural application and septic systems.

Radioactive contaminants, that can be naturally occurring or be the result of oil and gas production and mining activities.



AREA 1- (870 ZONE) IS FED FROM CHINO I DESALTER & SUPLEMENTED FROM AREA 2

AREA 2- IS FED FROM ROGER TEAGARDEN IXP, 17/18 IXP, CHINO II DESALTER, & ADDITIONAL WELLS IN THE 870, 980 & 1110 ZONES

AREA 3 - (900, 1100, 1200, 1350 ZONES) IS FED PRIMARILY FROM AREA 2, OCCASIONALLY FROM AREA 1 DURING LOW WATER DEMAND PERIODS & SUPPLEMENTED FROM RUBIDOUX COMMUNITY SERVICES DISTRICT (BETWEEN JANUARY 2010 THRU DECEMBER 2010)

Abbreviations

mg/L	*milligrams per liter or parts per million (ppm)*	**pCi/L**	*pico Curies per liter (a measure of radiation)*
	(1 ppm is equivalent to 1 second in 11.5 days)	**TT**	*Treatment Technique*
NA	*Not Applicable*	**µg/L**	*micrograms per liter or parts per billion (ppb)*
ND	*Not Detectable at testing limit*	**µS/cm**	*microsiemens per centimeter, a unit of conductance*
ng/L	*nanograms per liter or parts per trillion (ppt)*		*(1 µS/cm = 1 µmho/cm)*

Jurupa Community Services District
Water Quality Report for 2010

Primary Drinking Water Standards

Table 1 - Sampling Results Showing Detection of Coliform Bacteria

Microbiological Contaminants	1110 Zone (Chino II)		980 Zone		870 Zone (IXP)		870 Zone (Chino I)		Rubidoux Inter-Tie		Drinking Water Standard Information		
	Highest No. of Detections	No. of Months in Violation	Highest No. of Detections	No. of Months in Violation	Highest No. of Detections	No. of Months in Violation	Highest No. of Detections	No. of Months in Violation	Highest No. of Detections	No. of Months in Violation	MCL	PHG (MCLG)	Typical Source of Bacteria
Total Coliform Bacteria (Total Coliform Rule)	0%	0	0%	0	0%	0	0%	0	2.5%	0	More than 5% of monthly samples are positive	(0)	Naturally present in the environment
Fecal Coliform or E. coli (Total Coliform Rule)	0%	0	0%	0	0%	0	0%	0	0%	0	A routine sample and a repeat sample are total coliform positive, and one of these is also fecal coliform or E. coli positive	(0)	Human and animal fecal waste

Microbiological Contaminants	Source Well		Source Wells		Source Wells		Source Wells		Source Wells		MCL	PHG (MCLG)	Health Effects
	No. of Detections	Range of Detections	No. of Detections	Range of Detections	No. of Detections	Range of Detections	No. of Detections	Range of Detections	No. of Detections	Range of Detections			
E. coli (Federal Ground Water Rule)	0	ND	0	ND	0	ND	NA	NA	NA	NA	0	(0)	Fecal coliforms and E. coli are bacteria whose presence indicates that the water may be contaminated with human or animal wastes. Microbes in these wastes can cause short-term effect, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a special health risk for infants, young children, some of the elderly, and people with severely compromised immune systems.
Fecal Indicators (Enterococci or Coliphage) (Federal Ground Water Rule)	0	ND	0	ND	0	ND	NA	NA	NA	NA	(1)T T	NA	Fecal indicators are microbes whose presence indicates that the water may be contaminated with human or animal wastes. Microbes in these wastes can cause short-term effect, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a special health risk for infants, young children, some of the elderly, and people with severely compromised immune systems.

Table 2 - Sampling Results Showing Detection of Lead and Copper

Lead and Copper	Reporting Unit	No. of Samples	90th % Level Detected	No. of Samples	90th % Level Detected	No. of Samples	90th % Level Detected	No. of Samples	90th % Level Detected	No. of Samples	90th % Level Detected	Number of Sites Exceeding (AL)	Action Level (AL)	PHG (MCLG)	Typical Source of Contamination
Lead (Pb)	µg/L	NA	NA	NA	NA	33	ND	NA	NA	31	ND	0	15	0.2	Internal corrosion of household water plumbing systems; discharges from industrial manufacturers: erosion of natural deposits
Copper (Cu)	mg/L	NA	NA	NA	NA	33	0.16	NA	NA	31	0.49	0	1.3	0.3	Internal corrosion of household plumbing systems; erosion of natural deposits; leaching from wood preservatives

Table 3 - Sampling Results Showing Detection of Primary Contaminants

Contaminants	Reporting Unit	Average Level Detected	Range of Detection	Average Level Detected	Range of Detection	Average Level Detected	Range of Detection	Average Level Detected	Range of Detection	Average Level Detected	Range of Detection	MCL	PHG (MCLG)	Major Sources in Drinking Water
Barium	µg/L	ND	ND	ND	ND - 100	ND	ND	ND	ND	ND	ND	1000	2000	Discharges of oil drilling wastes and from metal refineries; erosion of natural deposits
(4) Chromium (Total Cr)	µg/L	2.1	ND - 4	4.1	2.6 - 5.4	2.0	1.5 - 3.8	3.9	3.9	1.5	1.5	50	(100)	Discharge from steel and pulp mills and chrome plating; erosion of natural deposits
Fluoride (F)	mg/L	ND	ND - 0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.4	0.4	2	1	Erosion of natural deposits; water additive which promotes strong teeth; discharge from fertilizer & aluminum factories
* Nitrate (as NO_3)	mg/L	18	11 - 25	22	11 - 33	29	23 - 30	21	21	25	21 - 25	45	45	Runoff and leaching from fertilizer use; leaching from septic tanks and sewage; erosion of natural deposits
Gross Alpha	pCi/L	ND	ND	NA	NA	ND	ND	ND	ND	5.2	5.1 - 5.2	15	(0)	Erosion of natural deposits
Uranium	pCi/L	ND	ND	NA	NA	NA	NA	ND	ND	5.0	4.9 - 5.1	20	0.43	Erosion of natural deposits
Perchlorate	µg/L	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND - 4.6	6	6	Discharge from aerospace and other industrial facilities
Trichloroethylene (TCE)	µg/L	ND	ND	ND	ND	ND	(2) ND	ND	ND	NA	NA	5	1.7	Discharge from metal degreasing sites and other factories
Tetrachloroethylene (PCE)	µg/L	ND	ND	ND	(2) ND	ND	ND	ND	ND	NA	NA	5	0.06	Dicharge from factories, dry cleaners, and auto shops (metal degreaser)
Total THM's (Trihalomethanes)	µg/L	ND	ND - 1.0	NA	NA	12	10 - 14	ND	ND	17.4	12 - 22	80	NA	By-product of drinking water disinfection
Haloacetic Acids (HAA5)	µg/L	ND	ND	NA	NA	6.6	ND - 8.6	NA	NA	8.8	ND - 11.0	60	NA	By-product of drinking water disinfection

Secondary Drinking Water Standards

Table 4 - Sampling Results Showing Detection of Secondary Contaminants

Contaminants	Reporting Unit	Average Level Detected	Range of Detection	Average Level Detected	Range of Detection	Average Level Detected	Range of Detection	Average Level Detected	Range of Detection	Average Level Detected	Range of Detection	MCL	PHG (MCLG)	Typical Source of Contamination
Chloride (Cl)	mg/L	75	9.3 - 96	62	23 - 210	122	19 - 150	100	100	54	14 - 65	500	NA	Runoff, leaching from natural deposits; seawater influence
Calcium (Ca)	mg/L	54	41 - 63	74	59 - 130	84	56 - 92	45	45	80	80	NA	NA	One of the elements that make up the earths crust's as components of many rock-forming minerals
Magnesium (Mg)	mg/L	6.9	5.4 - 8	7.4	5.4 - 13	9.0	6 - 9.7	9.8	9.8	12	12	NA	NA	One of the elements that make up the earths crust's as components of many rock-forming minerals
Potassium (K)	mg/L	(3) 2.0	1.0 - 2.0	2.5	2.3 - 2.9	2.4	2.2 - 2.5	1.2	1.2	3.9	3.9	NA	NA	One of the elements that make up the earths crust's as components of many rock-forming minerals
pH	Standard Unit	7.7	7.4 - 7.9	7.7	7.6 - 7.8	7.6	7.6 - 7.8	7.2	7.2	7.4	7.4 - 7.6	NA	NA	Erosion of natural deposits
Specific Conductance (E.C.)	µmho/cm	496	380 - 550	606	480 - 1000	736	460 - 810	540	540	793	660 - 830	1600	NA	Substances that form ions when in water; seawater influence
Sulfate (SO_4)	mg/L	8	4 - 12	22	17 - 27	(3) 17	15 - 17	9.4	9.4	78	62 - 88	500	NA	Runoff, leaching from natural deposits; industrial wastes
Total Alkalinity	mg/L	91	72 - 140	130	120 - 140	132	130 - 140	69	69	200	200	NA	NA	Alkalinity is a measure of the buffering capacity of water, or the capacity of bases to neutralize acids
Total Disolved Solids (TDS)	mg/L	317	220 - 560	414	300 - 820	587	280 - 670	320	320	471	420 - 500	1000	NA	Runoff/leaching from natural deposits
Turbidity	NTU	ND	ND	ND	ND - 0.27	ND	ND	ND	ND	0.48	ND - 9.7	5	NA	Soil runoff
Foaming Agents (MBAS)	µg/L	ND	ND - 60	39	ND - 90	ND	ND	ND	ND	90	90	500	NA	Municipal and industrial waste discharges

Table 5 - Sampling Results Showing Detection of Sodium and Hardness

Contaminants	Reporting Unit	Average Level Detected	Range of Detection	Average Level Detected	Range of Detection	Average Level Detected	Range of Detection	Average Level Detected	Range of Detection	Average Level Detected	Range of Detection	MCL	PHG (MCLG)	Typical Source of Contamination
Sodium (Na)	mg/L	24	21 - 27	25	24 - 29	30	21 - 32	31	31	57	31 - 64	NA	NA	Generally found in ground and surface water
Total Hardness ($CaCO_3$)	mg/L	165	120 - 190	216	170 - 380	247	160 - 270	150	150	250	220 - 280	NA	NA	Generally found in ground and surface water

Table 6 - Sampling Results Showing Detection of Unregulated Contaminants

Contaminants	Reporting Unit	Average Level Detected	Range of Detection	Average Level Detected	Range of Detection	Average Level Detected	Range of Detection	Average Level Detected	Range of Detection	Average Level Detected	Range of Detection	Notification Level	PHG (MCLG)	Health Effects
Boron	µg/L	ND	ND	ND	ND	ND	ND	110	110	180	ND - 250	1000	NA	The babies of some pregnant women who drink water containing boron in excess of the notification level may have an increased risk of developmental effects, based on studies in laboratory animals
(4) Hexavalent Chromium (Collected in 2009)	µg/L	0.99	0.70 - 3.7	4.3	1.3 - 6.9	2.0	0.42 - 3.7	NA	NA	NA	NA	NA	NA	NA
Total Silica	mg/L	NA	NA	NA	NA	NA	NA	9.8	9.8	NA	NA	NA	NA	NA
Trichloropropane (1, 2, 3 - TCP)	ng/L	ND	ND	ND	ND	ND	ND - 15	15	15	NA	NA	5	NA	Some People who use water containing Trichloropropane (1, 2, 3-TCP) in excess of the notification level over many years may have increased risk of getting cancer, based on studies in laboratory animals

(1) NOTE: TT (Treatment Technique) is a requirement of the National Primary Drinking Water Regulations that specifies, for a particular contaminant, one or more specific treatment techniques that lead to a reduction in the level of the contaminant sufficient to achieve compliance with the requirements of 40 code of Federal Regulations Part 141.

(2) NOTE: The treated water samples with ND results are used for Range of Detections for TCE (Trichloroethylene) and PCE (Tetrachloroethylene). The untreated water (raw water) samples had the highest Range of Detection of 0.53 µg/L for TCE and 0.93 µg/L for PCE.

(3) NOTE: The average level shown is due to rounding the number.

(4) NOTE: The sum of chromium-3 (trivalent chromium) and chromium-6 (hexavalent chromium) gives you the value for total chromium that has an MCL of 50 µg/L.

* Under permit for CA Department of Public Health Services, JCSD may blend higher nitrate water sources with lower sources, all under the MCL which were administrative in nature to achieve an acceptable blend. This water is to be blended with all wells within this zone to maintain a maximum blended limit below 36 mg/L (which is 80% of the maximum contaminant level of 45 mg/L). 10 ppm of Nitrate as Nitrogen (NO_3-N) is the same as 44 ppm of Nitrate as Nitrate (NO_3).

JCSD uses Sodium Hypochlorite (Chlorine) for disinfection. JCSD does not use Chloramines.

For additional information regarding your water quality, please contact our Water Quality Department at: (951) 685-7434 Ext. 198.

WATER | ENERGY | LIFE

CITY OF RIVERSIDE

PUBLIC UTILITIES

Water Quality Report 2010

An important message about drinking water sources from the USEPA

The sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of land or through the ground, it dissolves naturally occurring minerals, and in some cases radioactive materials, and can pick up substances resulting from the presence of animals or human activity. Contaminants that may be present in source water include:

Microbial Contaminants, such as viruses and bacteria, that may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.

Inorganic Contaminants, such as salts and metals, that can be naturally occurring or result from urban stormwater runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming.

Pesticides and Herbicides, which may come from a variety of sources, such as agriculture, urban stormwater runoff, and residential uses.

Organic Chemical Contaminants, including synthetic and volatile organic chemicals, which are by-products of industrial processes and petroleum production and can also come from gas stations, urban storm water runoff, agricultural application, and septic systems.

Radioactive Contaminants, which can be naturally occurring or be the result of oil and gas production and mining activities.

Regulations: In order to ensure that tap water is safe to drink, U.S. Environmental Protection Agency and the California Department of Public Health (CDPH) prescribe regulations that limit the amount of certain contaminants in water provided by public water systems. Department regulations also establish limits for contaminants in bottled water that must provide the same protection for public health.

Important Health Information: Some people may be more vulnerable to contaminants in drinking water than the general population. Immunocompromised persons, such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly people, and infants, can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. USEPA/CDC guidelines on appropriate means to lessen the risk of infection by Cryptosporidium and other microbial contaminants are available from the Safe Drinking Water Hot Line. Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that the water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the USEPA's Safe Drinking Water Hotline at 1(800) 426-4791.

Water Sources: Riverside's water is groundwater from wells in the Bunker Hill Basin and Riverside Basin. RPU and other water agencies completed a source-water assessment study for Bunker Hill Basin in San Bernardino in October 2002 and the Riverside Basin in 2000. The source water assessment reports were submitted to the CDPH. Copies are available at Riverside Public Utilities, Water Resources.

This report contains important information about your drinking water. Translate it or speak with someone who understands it.

SPANISH

Este reporte contiene información muy importante sobre su agua potable. Tradúzcalo ó hable con alguien que lo entienda bien. Para más información por favor llame (951) 782-0330.

CHINESE

此份有关你的食水报告,内有重要资料和讯息,请找他人为你翻译及解释清楚。

JAPANESE

この情報は重要です。
翻訳を依頼してください。

TAGALOG

Mahalaga ang impormasyong ito.
Mangyaring ipasalin ito.

VIETNAMESE

Chi tiết này thật quan trọng.
Xin nhờ người dịch cho quý vị.

KOREAN

이 안내는 매우 중요합니다.
본인을 위해 번역인을 사용하십시요.

BlueRiverside.com • 951.351.6331 • 3901 Orange Street • Riverside, CA 92501

SECONDARY STANDARDS

AESTHETIC STANDARDS

	STATE MCL	RIVERSIDE PUBLIC UTILITIES AVERAGE	RIVERSIDE PUBLIC UTILITIES RANGE	SOURCES IN DRINKING WATER
Odor Threshold	3	<1	<1 - 1	Naturally present in environment
Chloride	500 ppm	29 ppm	25 - 31 ppm	Naturally present in environment
Sulfate	500 ppm	67 ppm	57 - 79 ppm	Naturally present in environment
Total Dissolved Solids "TDS"	1,000 ppm	363 ppm	300 - 430 ppm	Naturally present in environment
Specific Conductance	1,600 µmho	575	560 - 590	Substances form ions in water
Corrosivity	Noncorrosive	0.7	0.6 - 0.7	Natural or industrially influenced balance of hydrogen, carbon, and oxygen in the water; affected by temperature and other factors
pH Units	NS	7.7 units	7.0 - 8.1 units	Naturally present in environment
Hardness ($CaCO_3$)	NS	200 ppm (12 gpg)	190 - 210 ppm	Naturally present in environment
Alkalinity ($CaCO_3$)	NS	160 ppm	150 - 170 ppm	Naturally present in environment
Sodium	NS	40 ppm	38 - 42 ppm	Naturally present in environment
Calcium	NS	64 ppm	61 - 67 ppm	Naturally present in environment
Potassium	NS	3 ppm	3 ppm	Naturally present in environment
Magnesium	NS	10 ppm	9 - 11 ppm	Naturally present in environment

Monitoring Report 2010

Riverside Public Utilities tests for more than 200 possible contaminants in our water system. This report provides data from sampling conducted in calendar year 2010. Only those contaminants detected in our water system are listed here. For a listing of additional chemical tests, please contact Water Quality Manager Adam Ly at (951) 351-6331.

Water Resources

Riverside met all of its water supply needs by utilizing groundwater sources located in the San Bernardino, Bunker Hill, and Riverside Basins.

Water Compliance & Monitoring Program

In 2010, we collected more than 18,600 water samples to test for a variety of potential contaminants. Samples were collected at water sources, along transmission pipelines, throughout the distribution system, including reservoirs and booster stations, and treatment plants to ensure water quality from its source to your meter.

The Utility uses state certified independent laboratories to perform water tests. This ensures that an independent set of experts test your water from the source to your meter. Last year, we spent more than $700,000 on compliance laboratory costs.

Riverside Public Utilities 2010 Water Sampling Data

6,752 - Samples collected to test for bacteria.

6,527 - Samples collected for source and system compliance and monitoring.

5,376 - Samples collected for treatment plant compliance and monitoring.

18,655 - Total samples collected.

We are pleased to report that our water met or surpassed all state and federal drinking water quality standards in 2010. We welcome you to attend our Board of Public Utilities meetings at 3901 Orange Street, in Riverside, held at 8:30 a.m. on the first and third Fridays of each month. You can also visit our website at BlueRiverside.com for more information.

RIVERSIDE PUBLIC UTILITIES 2010 WATER QUALITY REPORT

PRIMARY STANDARDS: MANDATORY HEALTH-RELATED STANDARDS

CONTAMINANT	STATE MCL	STATE PHG	RIVERSIDE PUBLIC UTILITIES AVERAGE	RIVERSIDE PUBLIC UTILITIES RANGE	SOURCES IN DRINKING WATER
MICROBIOLOGICAL					
Total Coliform (P/A) (a)	5%	0%	0%	0 - 0.5%	Naturally present in environment
CLARITY					
Turbidity	0.5 NTU	NS	0.1 NTU	<0.1 - 0.7 NTU	Naturally present in environment
REGULATED ORGANIC					
Total Trihalomethanes "TTHMs"	80 ppb	NS	10 ppb	ND - 15 ppb	By-product of drinking water disinfection
Halocetic Acids "HAA5"	60 ppb	NS	ND	ND - 2 ppb	By-product of drinking water chlorination
Chlorine	4 ppm	4 ppm	0.5 ppm	ND - 1.6 ppm	Drinking water disinfectant added for treatment
Control of DBP precursors Total Organic Carbon "TOC"	Treatment Requirement	NS	0.4 ppm	ND - 0.8 ppm	Various natural and man-made sources
Dibromochloropropane "DBCP"	200 ppt	1.7 ppt	ND	ND - 10 ppt	Banned nemotacide still present due to past agricultural activities
REGULATED INORGANIC					
Arsenic	10 ppb	4 ppt	2 ppb	ND - 2 ppb	Erosion of natural deposits
Fluoride	2 ppm	1.0 ppm	0.6 ppm	0.5 - 0.6 ppm	Naturally present in environment
Nitrate (NO_3)	45 ppm	45 ppm	22 ppm	18 - 30 ppm	Naturally present in environment
Perchlorate	6 ppb	6 ppb	ND	ND - 4 ppb	Inorganic chemical used in variety of industrial operations.
RADIOLOGICAL					
Gross Alpha	15 pCi/L	NS	7 pCi/L	<3 - 20 pCi/L	Erosion of natural deposits
Uranium	20 pCi/L	0.5 pCi/L	9.5 pCi/L	<1 - 18 pCi/L	Erosion of natural deposits
LEAD/COPPER (AL) (90% Household Tap)					
Copper (b)	1,300 ppb	170 ppb	470 ppb	<50 - 730 ppb	Internal corrosion of home plumbing

REGULATED CONTAMINANTS WITH NO MCLS	NOTIFICATION LEVEL	STATE PHG OR MCLG	RIVERSIDE AVERAGE	RIVERSIDE RANGE
Chromium VI	NS	NS	2.2 ppb	1.6 - 2.7 ppb
Vanadium	NL 50 ppb	NS	6 ppb	6 - 7 ppb
Boron	NL 1000 ppb	NS	125 ppb	100 - 160 ppb

Definitions

Maximum Contaminant Level (MCL) The highest level of a contaminant that is allowed in drinking water. Primary MCLs are set as close to the PHGs (or MCLGs) as is economically and technologically feasible. Secondary MCLs are set to protect the odor, taste, and appearance of drinking water.

Maximum Contaminant Level Goal (MCLG) The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs are set by the US Environmental Protection Agency (EPA).

Public Health Goal (PHG) The level of a contaminant in drinking water below which there is no known or expected health risk. PHGs are set by the California EPA.

Regulatory Action Level (AL) The concentration of a contaminant which, if exceeded, triggers treatment or other requirements that a water system must follow.

Primary Drinking Water Standard (PDWS) MCLs and MRDL's for contaminants that affect health, along with their monitoring and reporting requirements, and water treatment requirements.

Maximum Residual Disinfectant Level (MRDL) The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.

Maximum Residual Disinfectant Level Goal (MRDLG) The level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.

Parts Per Million (ppm) One part per million corresponds to one minute in two years or one penny in $10,000.

Parts Per Billion (ppb) One part per billion corresponds to one minute in 2,000 years or one penny in $10,000,000.

Parts Per Trillion (ppt) One part per trillion corresponds to one minute in two million years or one penny in $10,000,000,000.

Picocuries Per Liter (pCi/L) A measure of the radioactivity in water.

Nephelometric Turbidity Units (NTU) A measure of suspended material in water.

Micromhos (µMHOS) A measure of conductivity (electric current) in water.

NL	Notification level.
ND	Not detected at the detection limit for reporting.
NS	No standard.
GPG	Grains per gallon of hardness (1 gpg = 17.1 ppm).
<	Less than the detectable levels.

(a) Results of all samples collected from the distribution system during any month shall be free of total coliforms in 95 percent or more of the monthly samples.

(b) The Lead and Copper Rule requires that 90 percent of samples taken from drinking water taps in the program homes must be below the action levels. Monitoring is required every 3 years. In 2010, 62 homes participated in the monitoring program. No lead was detected in the samples collected. The next monitoring program is scheduled for 2013.

Additional Regulatory Information

Fluoride - The California Department of Public Health (CDPH) has established an "optimal" fluoride level for water at 1 ppm. Riverside has naturally occurring fluoride levels at 0.6 ppm and is not planning to add fluoride to its water by artificial means.

Lead - If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. Riverside Public Utilities is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to two minutes before using water for drinking or cooking. If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods, and steps you can take to take minimize exposure is available from the Safe Drinking Water Hotline or at www.epa.gov/safewater/lead.

Nitrate - In drinking water at levels above 45 ppm is a health risk for infants of less than six months of age. Such nitrate levels in drinking water can interfere with the capacity of an infant's blood to carry oxygen, resulting in a serious illness; symptoms include shortness of breath and blueness of the skin. Nitrate levels above 45 ppm may also affect the ability of the blood to carry oxygen in other individuals, such as pregnant women and those with certain specific enzyme deficiencies. If you are caring for an infant or you are pregnant, you should ask advice about nitrate levels from your health care provider.

Riverside provides drinking water that on average is at 22 ppm and has a range from 18 ppm to 30 ppm during the year. CDPH has set the MCL for nitrate at 45 ppm. Riverside has 52 wells that are blended to comply with drinking water standards. The city conducts extensive monitoring of the blend operations. Seasonal variation in demand and flow, in addition to system maintenance and repair, impact the nitrate levels during the year.

Perchlorate - Perchlorate is a regulated drinking water contaminant in California. The maximum contaminant level for perchlorate is 6 parts per billion. Perchlorate salts were used in solid rocket propellants and other industrial applications.

Monitoring Unregulated Contaminants

This monitoring helps USEPA to determine where certain contaminants occur and whether the contaminants need to be regulated. Data is available at www.epa.gov/ogwdw.

STATEMENT

This brochure is a summary of the quality of water that Riverside Highland Water Company provided to its customers in 2010. Included are details about where your drinking water comes from, what it contains, and how it compares to State and Federal Standards. The enclosed tables show the results of our monitoring for the period of January 1st to December 31st, 2010. In some instances, the results are from prior years because not all constituents in water are required to be tested every year according to the vulnerability of the water being pumped from certain basins.

In an effort to keep our customers informed, we are providing you with updated information because we feel ***well informed customers/shareholders are our best allies***. If, after reading this report, you have any questions or concerns, please call Don Hough, General Manager, or Craig Gudgeon, Distribution Superintendent, at (909) 825-4128.

Also included in this brochure are our Annual Shareholders Letter and Financial Statements for 2010.

Incorporated February 21, 1898, Riverside Highland Water Company is proud to be celebrating its **113th year of continuous operation**. This achievement could not have been attained without the ongoing support and involvement of our shareholders.

In 2010, your drinking water met all Environmental Protection Agency (EPA) and State of California drinking water health standards. Riverside Highland Water Company diligently safeguards your water supply and will continue to improve our water delivery system in an effort to maintain our high water quality standards.

The ongoing goal of Riverside Highland Water Company's Management and Staff is to provide you, our customers/shareholders, with safe and reliable drinking water. We are committed to providing excellent customer service and will respond **24 hours a day, seven days a week**, if you have a problem. All you have to do is call (909) 825-4128.

The company is managed by a nine member Board of Directors, of which, three are elected each year. The Board members for 2010 were William McKeever, President; Karen McHugh, Vice President; Anthony Petta, Secretary/Treasurer; Wendell Baker, Robert Best, James McNaboe, Frank Ferré, Denis Kidd, and Donald Larkin, Jr. The daily operation of the company was the responsibility of Don Hough, General Manager; Sharon Sanchez, Administrative Secretary/Treasurer and Craig Gudgeon, Distribution Superintendent.

The company's annual shareholders' meeting is the fourth Thursday of March at 9:00 a.m. The location of the meeting is included in the shareholders' packet. The Board of Directors meet on the fourth Thursday of each month. For additional information regarding Board meetings or this report, please call Mr. Hough at (909) 825-4128.

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NAVIGATION

Statement
Water Protection Plan
CCR Definitions
Monitoring Report
System Reliability
Water Conservation Tips

Important Health Information

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ trasplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seeks advice about drinking water from their health care providers. USEPA/Centers for Disease Control (CDC) guidelines on appropriate means to lessen the risk of infection by Cryptosporidium and other microbial contaminants are available from the Safe Drinking Water Hotline.

Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the EPA's Safe Drinking Water Hotline (1-800-426-4791).

The sources of drinking water (both tap water and bottled water) include rivers, lakes streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally-occuring minerals and, in some cases, radioactive material, and an pick up substances resulting from the presence of animals or from human activity. Contaminants that may be present in source water include:

Microbial Contaminants, such as viruses and bacteria, that may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.

Inorganic Contaminants, such as salts and metals, that can be naturally-occurring or result from urban stormwater runoff, industrial or domestic wastewater discharges, oil and gas production mining, or farming.

Pesticides and Herbicides, which may come from a variety of sources such as agriculture, urban stormwater runoff, and residential uses.

Organic Chemical Contaminants, including synthetic and volatile chemicals, that are by-products of industrial processes and petroleum production, and can also come from gas stations, urban stormwater runoff, and septic systems.

Radioactive Contaminants, which can be naturally-occurring or be the result of oil and gas production and mining activities.

Regulations: In order to ensure that tap water is safe to drink, USEPA and the California Department of Health Services (Department) prescribe regulations that limit the amount of certain contaminants in water provided by public water systems.

Department regulations also establish limits for contaminants in bottled water that must provide the same protection for public health.

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CCR DEFINITIONS

CONSUMER CONFIDENCE REPORT DEFINITIONS	
NA	Not available or not determined.
ND	Non-detected or below detection limit; constituent is not present or detectable.
ppm or mg/L	Parts per million: approximately one minute in two years.
ppb or ug/L	Parts per billion: approximately one minute in 2000 years.
ppt or nanograms/L	Parts per trillion: approximately one minute in 2 million years.
ppq or picograms/L	Parts per quadrillion: approximately one minute in 2 billion years.
pCi/L	Pico curies per liter: is a measure of radioactivity in water.
MFL	Million fibers per liter: measure of the presence of asbestos fibers that are longer than 1.0 micrometer.
NTU	Nephelometric Turbidity Units – measure of the clarity of water. Turbidity in above 5 NTU is just noticeable with the eye.
AL	Regulatory Action Level: the concentration of a contaminant, which if exceeded, triggers treatment or other requirements which a water system must follow.
MCL	Maximum Contaminant Level: The highest level of a contaminant that is allowed in drinking water. Primary MCLs are set as close to the PHGs (or MCLGs) as is economically and technologically feasible. Secondary MCLs are set to protect the odor, taste, and appearance of drinking water.
MCLG	Maximum Contaminant Level Goal: The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs are set by the U.S. Environmental Protection Agency.
PHG	Public Health Goals: the level of a contaminant in drinking water below which there is no known or expected risk to health. PHGs are set by the California Environmental Protection Agency.
PDWS	Primary Drinking Water Standards: MCL's for contaminates that affect health along with their monitoring and reporting requirements, and water treatment requirements.
Range	The lowest and highest level of constituent testing during the period.

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Statement
Water Protection Plan
CCR Definitions
CCR 2010
System Reliability
Water Conservation Tips

WATER MONITORING RESULTS

Microbiological Contaminants

Contaminant	Violation Y/N	Highest No. of dections	No. of months in violation	Unit Measurement	MCL in CCR units	PHG	MCLG	Likely Source of Contamination
Total Coliform Bacteria	N	0	0	0	For systems that collect less than 40 samples per month, no more than 1 positive sample	0	0	Naturally present in the environment
Fecal coliform and *E.coli*	N	0	0	0	a routine sample and repeat sample are total coliform positive, and one is also fecal coliform or *E. coli* positive	0	0	Human and animal fecal waste
Turbidity	N	0.2	0.1/0.4	TT	5	N/A	N/A	Soil runoff'

RADIOACTIVE CONTAMINANTS

Contaminant	Violation Y/N	Level Detected	Range	Unit Measurement	MCL in CCR units	PHG	MCLG or MRDLG	Likely Source of Contamination
Gross Alpha	N	5.6	N/D/11.3	pCi/L	15	N/A	N/A	Erosion of natural deposits
Uranium	N	5.1	N/D/10.4	pCi/L	20	0.43	N/A	Erosion of natural deposits
Radon	N	268	256/524	pCi/L	N/A	N/A	0*	Naturally occurring in soil

INORGANIC CONTAMINANTS

Contaminant	Violation Y/N	Level Detected	Range	Unit Measurement	MCL in CCR units	PHG	MCLG or MRDLG	Likely Source of Contamination
Arsenic	N	1.8	N/D/4.1	ppb	10	0.004	0.004	Erosion of natural deposits; runoff from orchards; glass and electronics production wastes
Fluoride	N	0.4	0.26/1.0	ppm	2.0	1	1	Erosion of natural deposits; water additive which promotes strong teeth; discharge from fertilizer and aluminum factories
Nitrate (as No3)	N	12	8.4/23	ppm	45	45	45	Runoff and leaching from fertilizer use; leaching from septic tanks and sewage; erosion of natural deposits
Nitrate + Nitrite as Nitrogen	N	2495	1800/6800	ppm	10,000	10,000	10,000	Runoff and leaching from fertilizer use; leaching from septic tanks and sewage; erosion of natural deposits

DISTRIBUTION SYSTEM - DISINFECTION BYPRODUCTS, DISINFECTANT RESIDUALS

Contaminant	Violation Y/N	Level Detected	Range	Unit Measurement	MCL in CCR units	PHG	MCLG	Likely Source of Contamination
TTHMs - Total Trihalomethanes	N	2.5	2.5/45.5	ppb	80	N/A	N/A	Byproduct of drinking water chlorination
Halocetic Acids	N	0.3	0.3/8.0	ppb	60	N/A	N/A	Byproduct of drinking water disinfection
Chlorine	N	0.52	0.36/0.57	ppm	4.0	4	4	Drinking water disinfection added for treatment

SECONDARY STANDARDS

Constituent	Violation Y/N	Level Detected	Range	Unit Measurement	MCL in CCR units	PHG	MCLG or MLDRG	Likely Source of Contamination
Chloride	N	17	4.5/53	ppm	500	N/A	N/A	Runoff/leaching from natural deposits; seawater influence
Barium	N	0.12	ND/130	ppb	1000	N/A	N/A	Discharge of oil drilling wastes and from metal refineries, erosion of natural deposits
Iron	N	0.14	ND/160	ppb	300	N/A	N/A	Leaching from natural deposits, industrial wastes
Odor	N	1	1/1	TON	3	N/A	N/A	Naturally occurring organic materials
pH	N	7.4	6.9/7.7	STD unit	6.5/8.5	N/A	N/A	Comparison of “Alkalinity” & “Acidity” of water
Specific Conductance	N	450	320/2560	US	1600	N/A	N/A	Substances that form ions when in water; seawater influence
Sulfate	N	39	20/120	ppm	500	N/A	N/A	Runoff, leaching from natural deposits; industrial waste
Total Dissolved Solids (TDS)	N	284	210/610	ppm	1000	N/A	N/A	Runoff, leaching from natural deposits
Foaming Agents (MBAS)	N	0.0005	N/D/0.020	ppb	500	N/A	N/A	Municipal and industrial waste discharges

ADDITIONAL CONSTITUENTS ANALYZED

Constituent	Violation Y/N	Level Detected	Range	Unit Measurement	MCL in CCR units	PHG	MCLG or MRDLG	Likely Source of Contamination
Calcium	N	60	30/120	ppm	N/A	N/A	N/A	Natural in limestone, marble, chalk
Total Hardness CA C03	N	187	95/330	ppm	N/A	N/A	N/A	Total concentration of calcium and magnesium
Total Alkalinity	N	125	120/320	ppm	N/A	N/A	N/A	Bicarbonate sand hydroxide components in raw water
Bicarbonate	N	222	140/390	ppm	N/A	N/A	N/A	Bicarbonate components in water
Magnesium	N	9	5.0/22.0	ppm	N/A	N/A	N/A	Metallic chemical element in soil
Potassium	N	3	2.8/4.6	ppm	N/A	N/A	N/A	Nutritional element in soil for humans
Sodium	N	32	15/99	ppm	N/A	N/A	N/A	Alkaline element industrial and chemical manufacturing

UNREGULATED CONTAMINANTS

Unregulated contaminant monitoring helps the EPA and the California Department of Health Services to determine where certain contaminants occur and whether the contaminants need to be regulated.

Chemical	Action Level ppb	Level Detected	Range	Health Effects
Boron	1000	87	N/D/270	The babies of some pregnant women who drink water containing boron in excess of the notification level may have an increased risk of development effects based on studies in laboratory animals.
Chromium VI (Hexavalent chromium)	N/A	0.3	N/D/1.7	N/A
Vanadium	0	4.2	N/D/4.6	The babies of some pregnant women who drink water containing vanadium in excess of the notification level may have an increased risk of development effects based on studies in laboratory animals.

LEAD & COPPER

Lead and Copper Rules became effective in 1993. The Company has performed six rounds of testing. The last round was performed in 2006. Another round is scheduled for July 2009. All samples are taken from first draw of morning water. The first two rounds were from 40 single-family residences with copper pipe with lead solder installed since 1982. Due to favorable results in earlier rounds, the 1997, 2000 and 2003 rounds included only 20 single-family residences. Because of the increase in our customer base, the 2006 round of testing required us to sample 30 single-family residences.

Contaminant	90TH Percentile	Unit Measurement	MCL In CCR Units	PHG	MCLG	Likely Source of Contamination
Lead	N/D	Ppb	AL 15	2	0	Internal corrosion of household plumbing system, discharge industrial mfg. erosion of natural deposits
Copper	0.36	Ppb	AL 1300	170	1300	Internal corrosion of household system, erosion of natural deposits

Rubidoux Community Services District

ANNUAL CONSUMER CONFIDENCE REPORT

Established 1952 Spring 2011

We are pleased to present to you this year's Annual Consumer Confidence Report. This report is designed to inform you about the quality of water and services we deliver to you every day. Our constant goal is to provide you with a safe and dependable supply of drinking water. We want you to understand the efforts we make to continually improve the water treatment process and protect our water resources. We are committed to ensuring the quality of your water. This report shows the quality of your water and what it means. We are pleased to report that your drinking water meets all federal and state requirements.

Este informe contiene información muy importante sobre su agua beber. Tradúzcalo ó hable con alguien que lo entienda bien.

The sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally-occurring minerals and, in some cases, radioactive material, and can pick up substances resulting from the presence of animals or from human activity.

Contaminants that may be present in source water include:

- *Microbial contaminants*, such as viruses and bacteria, that may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.
- *Inorganic contaminants*, such as salts or metals that can be naturally-occurring or result from urban stormwater runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming.
- *Pesticides and herbicides*, which may come from a variety of sources such as agriculture, urban stormwater runoff, and residential uses.
- *Organic chemical contaminants*, including synthetic and volatile organic chemicals that are byproducts of industrial processes and petroleum production, and can also come from gas stations, urban stormwater runoff, agricultural application, and septic systems.
- *Radioactive contaminants*, which can be naturally-occurring or be the result of oil and gas production and mining activities.

In order to ensure that tap water is safe to drink, the U.S. Environmental Protection Agency (USEPA) and the California Department of Public Heath (CDPH) prescribe regulations that limit the amount of certain contaminants in water provided by public water systems. CDPH regulations also establish limits for contaminants in bottled water that provide the same protection for public health.

Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that the water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the USEPA's Safe Drinking Water Hotline (800-426-4791), or the National Radon Hotline (800-SOS-RADON).

The water Rubidoux Community Services District delivers to you comes from groundwater, which we currently pump from six active drinking water wells (Wells 2, 4, 6, 8, 17, and 18). All of our wells are located within the Rubidoux Community Services District boundaries and draw from the Riverside South Groundwater Basin. Water from Wells 4 and 6 is treated at the District's Anita B. Smith Nitrate Removal Facility to reduce the concentration of nitrate before it enters the distribution system. To reduce the concentration of manganese in the water delivered to customers, water from Wells 17 and 18 is treated at the District's LaVerne J. Mahnke Manganese Removal Facility and blended with water from Wells 2 and 8 before it enters the distribution system.

We routinely monitor for contaminants in your drinking water according to Federal and State laws. Tables 1 through 7 list all of the drinking water contaminants that were detected during the period of January 1st to December 31st, 2010. The presence of these contaminants in the water does not necessarily indicate that the water poses a health risk. The State allows us to monitor for some contaminants less than once per year because the concentrations of these contaminants do not change frequently. Some of the data, though representative of the water quality, are more than one year old.

In this report are terms and abbreviations you might not be familiar with. To help you better understand these terms, we have provided the following definitions:

Non-Detect (ND) - laboratory analysis indicates that the constituent is not present at a level greater than or equal to the Detection Limit for Reporting (DLR).

Parts per million (ppm) or *Milligrams per liter (mg/L)* – a measure of concentration in water. One part per million corresponds to one minute in two years or a single penny in $10,000.

Parts per billion (ppb) or *Micrograms per liter (μg/L)* – a measure of concentration in water. One part per billion corresponds to one second in 11.5 years, or a single penny in $10,000,000.

Picocuries per liter (pCi/L) - a measure of the radioactivity in water.

Nephelometric Turbidity Unit (NTU) - a measure of the clarity of water. Turbidity in excess of 5 NTU is just noticeable to the average person.

Regulatory Action Level (AL) or Notification Level (NL) - the concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow.

Maximum Contaminant Level (MCL) - the highest level of a contaminant that is allowed in drinking water. Primary MCLs are set as close to the PHGs (or MCLGs) as is economically and technologically feasible. Secondary MCLs are set to protect the odor, taste, and appearance of drinking water.

Maximum Contaminant Level Goal (MCLG) - the level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs are set by the U.S. Environmental Protection Agency.

Maximum Residual Disinfectant Level (MRDL) - the highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.

Maximum Residual Disinfectant Level Goal (MRDLG) - the level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.

Public Health Goal (PHG) – the level of a contaminant in drinking water below which there is no known or expected risk to health. PHGs are set by the California Environmental Protection Agency. *Note: PHGs do not take into account economic or technological feasibility.*

Primary Drinking Water Standard (PDWS) – MCLs and MRDLs for contaminants that affect health, along with their monitoring and reporting requirements, and water treatment requirements.

Secondary Drinking Water Standard (SDWS) – MCLs for contaminants that affect taste, odor, or appearance of the drinking water. Contaminants with SDWSs do not affect health at the MCL levels.

No violations of the nitrate MCL (45 ppm) occurred at any time during 2010. As shown in Table 2, nitrate is present in detectable quantities in the water at an average concentration of 25 ppm. Nitrate in drinking water at levels above 45 mg/L is a health risk for infants of less than six months of age. Such nitrate levels in drinking water can interfere with the capacity of the infant's blood to carry oxygen, resulting in a serious illness; symptoms include shortness of breath and blueness of the skin. Nitrate levels above 45 mg/L may also affect the ability of the blood to carry oxygen in other individuals, such as pregnant women and those with certain specific enzyme deficiencies. If you are caring for an infant, or you are pregnant, you should seek advice from your health care provider. Nitrate levels may rise quickly for short periods of time because of rainfall or agricultural activity.

Perchlorate has been shown to interfere with uptake of iodide by the thyroid gland, and to thereby reduce the production of thyroid hormones, leading to adverse effects associated with inadequate hormone levels. Thyroid hormones are needed for normal prenatal growth and development of the fetus, as well as for normal growth and development in the infant and child. In adults, thyroid hormones are needed for normal metabolism and mental function.

Turbidity has no health effects. However, high levels of turbidity can interfere with disinfection and provide a medium for microbial growth. Turbidity may indicate the presence of disease-causing organisms. These organisms can include bacteria, viruses, and parasites that can cause symptoms such as nausea, cramps, diarrhea, and associated headaches.

The California Department of Public Health (CDPH) sets drinking water standards and has determined that chlorine is a health concern at certain levels of exposure. Chlorine is added to drinking water as a disinfectant to kill bacteria and other disease-causing microorganisms and is also added to provide continuous disinfection throughout the distribution system. Disinfection is required for surface water systems. However, at high doses for extended periods of time, chlorine has been shown to affect blood and the liver in laboratory animals. CDPH has set a drinking water standard for chlorine to protect against the risk of these adverse effects. Drinking water which meets this CDPH standard is associated with little to none of this risk and should be considered safe with respect to chlorine.

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. USEPA/Centers for Disease Control (CDC) guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* and other microbiological contaminants are available from the Safe Drinking Water Hotline (800-426-4791).

If you have any questions about this report or concerning your water utility, please contact Steven W. Appel, District Engineer, at the District office, (951) 684-7580. We want our valued customers to be informed about their water utility. If you want to learn more, please attend any of our regularly scheduled meetings. They are held on the first and third Thursdays of each month at 4:00 p.m. at 3590 Rubidoux Blvd., Rubidoux, CA 92509.

TABLE 1 – SAMPLING RESULTS SHOWING DETECTION OF COLIFORM BACTERIA

Microbiological Contaminant	Highest Percentage of Detections (in a month)	No. of Months in Violation	MCL	PHG (MCLG)	Typical Source of Bacteria
Total Coliform Bacteria	2.5%	0	Detections in 5% of monthly samples	0	Naturally present in the environment

TABLE 2 – DETECTION OF INORGANIC CONTAMINANTS WITH A PRIMARY DRINKING WATER STANDARD

Chemical or Constituent	Units	Average Level Detected	Range of Detection	MCL	PHG (MCLG)	Typical Source of Contaminant
Fluoride	ppm	0.4	0.2 – 0.5	2	1	Erosion of natural deposits; water additive that promotes strong teeth; discharge from fertilizer and aluminum factories
Nitrate	ppm	25	21-25	45	45	Runoff and leaching from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits

TABLE 3 – DETECTION OF ORGANIC CONTAMINANTS WITH A PRIMARY DRINKING WATER STANDARD

Chemical or Constituent	Units	Average Level Detected	Range of Detection	MCL or MRDL	PHG (MCLG or MRDLG)	Typical Source of Contaminant
Chlorine	ppm	0.8	0.4 – 2.5	4.0	4.0	Drinking water disinfectant added for treatment
HAA [Haloacetic Acids]	ppb	8.8[(a)]	0 – 11.0	60	None established	Byproduct of drinking water disinfection
Perchlorate	ppb	0.28	0 – 4.6	6	6	Discharge from aerospace and other industrial facilities
TTHMs [Total Trihalomethanes]	ppb	17.4[(a)]	12 – 22	80	None established	Byproduct of drinking water chlorination

TABLE 4 – SAMPLING RESULTS FOR RADIOACTIVITY

Gross Alpha Activity and Uranium samples are taken every three years. Data below reflect samples taken in 2010.

Chemical or Constituent	Units	Average Level Detected	Range of Detection	MCL	PHG (MCLG)	Typical Source of Contaminant
Alpha Activity, Gross	pCi/L	5.15	5.1 – 5.2	15	0	Erosion of natural deposits
Uranium	pCi/L	5.0	4.9 – 5.1	20	0.43	Erosion of natural deposits

TABLE 5 – DETECTION OF CONTAMINANTS WITH A SECONDARY DRINKING WATER STANDARD

Chemical or Constituent	Units	Average Level Detected	Range of Detection	MCL	PHG[(b)] (MCLG)	Typical Source of Contaminant
Chloride	ppm	54	14 - 65	500	None established	Runoff/leaching from natural deposits; seawater influence
pH	pH Units	7.4	7.4 - 7.6	None established	None established	Erosion of natural deposits
Specific Conductance	µS/cm	793	660 - 830	1600	None established	Substances that form ions when in water; seawater influence
Sulfate	ppm	78	62 - 88	500	None established	Erosion of natural deposits; industrial wastes
Total Dissolved Solids	ppm	471	420 - 500	1000	None established	Erosion of natural deposits
Turbidity	NTU	0.48	0 – 9.7[(c)]	5	None established	Erosion of natural deposits

TABLE 6 – SAMPLING RESULTS FOR LEAD[(d)] AND COPPER

Lead and copper samples are taken every three years. Data below reflect samples taken in 2008.

Chemical or Constituent and Reporting Units	No. of Samples Collected	90th Percentile Level Detected	No. of Sites Exceeding AL	AL	PHG (MCLG)	Typical Source of Contaminant
Copper (ppm)	31	0.49	0	1.3	0.3	Internal corrosion of household plumbing systems; erosion of natural deposits; leaching from wood preservatives
Lead (ppb)[(d)]	31	0	0	15	0.2	Internal corrosion of household water plumbing systems; discharges from industrial manufacturers; erosion of natural deposits

TABLE 7 – SAMPLING RESULTS FOR BORON, SODIUM, AND HARDNESS

Chemical or Constituent	Units	Average Level Detected	Range of Detection	MCL or NL	PHG (MCLG)	Typical Source of Contaminant
Boron	ppb	180	0 - 250	NL=1000	None established	Erosion of natural deposits
Sodium	ppm	57	31 – 64	None established	None established	Erosion of natural deposits
Hardness	ppm	250	220 - 280	None established	None established	Erosion of natural deposits

(a) Highest running annual average during 2010.

(b) There are no PHGs, MCLGs, or mandatory standard health effects language for these constituents because Secondary MCLs are set on the basis of aesthetics.

(c) Out of 162 system samples taken in 2010, there was only one detection of a turbidity level exceeding the Secondary MCL of 5 NTU.

(d) If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. Rubidoux Community Services District is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline (800-426-4791) or at http://www.epa.gov/safewater/lead.

West Valley Water District

Spring 2011 Volume 30

Water News

BASELINE FEEDER WELL REPLACEMENT PROJECT

In the early 1990's, San Bernardino Valley Municipal Water District (Valley District) in conjunction with West Valley Water District (WVWD) constructed water facilities known as the "Baseline Feeder". These facilities consisted of two wells, 9th Street Well and Perris Street Well, a pipeline, and other associated facilities to convey water from the southern and central part of the San Bernardino Basin to users on the west side of Valley District's service area. The customers of the Baseline Feeder include WVWD, City of Rialto, and Riverside Highland Water Company, each of which has a contract for a delivery of a certain volume of water from the Baseline Feeder system.

In 2005 the 9th Street well became inoperable and the Perris Street well became inoperable and was planned to be rehabilitated. A proposed new project was conceived, the Baseline Feeder Well Replacement Project, to support continued production and distribution of potable water to Valley District's customers in the western portion of its service area by replacing the well capacity lost from the 9th Street and Perris Street wells.

In order to replace the lost capacity of up to 7,000 gallons per minute from the 9th Street and Perris Street wells, Valley District, in cooperation with WVWD and the Baseline Feeder Stakeholders, proposed to install two replacement wells and associated facilities on WVWD property in the Lytle Creek Alluvial Fan.

The two wells proposed would each have a rated capacity of up to 3,500 gallons per minute. In addition to the wells, a reservoir of 350,000 gallons capacity would be constructed. The associated facilities would include a pump station to boost water from the reservoir to the Baseline Feeder; a chlorination system; a retention pond to contain recharge onsite storm water; control systems; supporting electrical facilities; sound control buildings for booster pumps and control panels; and a limited amount of pipeline.

In addition, work on the Perris Street well site would consist of well rehabilitation work, wellhead improvement, and installation of new pumping equipment. A new sound control enclosure will be installed as part of the construction.

It is estimated that construction would be completed and the new facilities operational by summer of 2012.

Wells would be pumped to provide water to the Baseline Feeder up to 24 hours per day. WVWD staff would visit the site one to two times a day to check on well operations. Well monitoring and water quality monitoring will also occur on a regular basis.

WEST VALLEY WATER DISTRICT

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2010 CONSUMER CONFIDENCE REPORT

The West Valley Water District is pleased to provide you with the 2010 Consumer Confidence Report. We want to keep you informed about the quality of your drinking water, detected contaminants and possible health risks. We believe these regulations are very important and we make every effort to present this detailed information in a simple manner. We encourage you to read this report and if you have any questions, please feel free to contact, Ken Sikorski, Superintendent/Chief Operator at (909) 875-1322. The information in this report is also submitted to the California Department of Public Health. They monitor our compliance for all water quality regulatory standards to assure safe drinking water is consistently delivered to your tap. For more information on your District, please visit our Website at www.wvwd.org.

Nosotros creemos que estas regulaciónes son muy importantes y estamos poniendo todo nuestro esfuerzo para presentar toda esta información detallada en una manera sencilla. Si usted necesita assistencia en español con este reporte, por favor de contactarnos al (909) 875-1804 o visitenos en 855 W. Baseline Road, Rialto, CA 92377.

Board meetings are held on the 1st and 3rd Thursday of the month at 3:00 p.m. in the District Board Room located at 855 W. Baseline, Rialto, CA. For information on agenda items or group tours of the Oliver P. Roemer Water Filtration Facility, please contact Peggy Asche at (909) 875-1804.

IMPORTANT DEFINITIONS

To protect public health, the US Environmental Protection Agency and the California Department of Public Health will commonly use the following definitions to standardize water quality information.

- **Maximum Contaminant Level (MCL):** The highest level of a contaminant that is allowed in drinking water. Primary MCL's are set as close to the PHG's (or MCLG's) as is economically and technologically feasible.
- **Secondary MCL's:** are set to protect the odor, taste and appearance of drinking water.
- **Maximum Contaminant Level Goal (MCLG):** This level of a contaminant in drinking water below which there is no known or expected risk to health. MCLG's are set by the U.S. Environmental Protection Agency.
- **Public Health Goal or PHG:** The level of a contaminant in drinking water below, which there is no known or expected risk to health. PHG's are set by the California Environmental Protection Agency.
- **Maximum Residual Disinfectant Level (MRDL):** The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.
- **Maximum Residual Disinfectant Level Goal (MRDLG):** The level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.
- **Primary Drinking Water Standard or PDWS:** MCL's for contaminants that affects health along with their monitoring and reporting requirements, and water treatment requirements.
- **Treatment Technique:** A required process intended to reduce the level of a contaminant in drinking water.
- **Picocuries per Liter (pCi/L):** Measurement of the radioactivity in water.
- **Nephelometric Turbidity Unit (NTU):** A measure of clarity of water. Turbidity in excess of 5 NTU is just noticeable to the average person.
- **Milligrams per Liter (Mg/L):** Or part per million corresponds to one minute in two (2) years.
- **Micrograms per Liter (Ug/L):** Or parts per billion: One microgram per liter corresponds to one (1) minute in 2000 years.
- **State Regulatory Action Level (AL):** Concentration of a contaminant which, when exceeded, triggers treatment or other requirements that a water system must follow.
- **N/A:** not applicable
- **N/D:** not detected
- **NL:** notification level
- **DLR:** Detection Level for Purposes of Reporting
- **Drinking Water Source Assessment and Protection (DWSAP):** Source assessment program for all District water sources.
- **IDSE:** Initial Distribution System Evaluation

EDUCATIONAL INFORMATION TO LEARN MORE ABOUT YOUR DRINKING WATER

Drinking water, including bottled, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the EPA's Safe Drinking Water Hotline (1-800-426-4791).

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as people with cancer undergoing chemotherapy, people who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. US EPA/ Centers for Disease Control (CDC) guidelines on appropriate means to lessen the risk of infection by Cryptosporidium and other microbial contaminants are available from the Safe Drinking Water Hotline (1-800-426-4791).

The sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally-occurring minerals and in some cases, radioactive material and can pick up substances resulting from the presence of animals or from human activity.

Contaminants that may be present in source water include:

- Microbial Contaminants, such as viruses and bacteria that may come from sewage treatment plants, septic systems, agricultural livestock operations, and wild life.
- Inorganic Contaminants, such as salts and metals, that can be naturally-occurring or result from urban storm water runoff, industrial or domestic waste water discharges, oil and gas production, mining or farming.
- Pesticides and herbicides, that may come from a variety of sources such as agriculture, urban storm water runoff, and resident uses.
- Organic chemical contaminants, including synthetic and volatile organic chemicals that are by-products of industrial processes and petroleum productions, and can also come from gas stations, urban storm water runoff, and septic systems.
- Radioactive contaminants that can be naturally-occurring or be the result of oil and gas productions and mining activities.

In order to ensure that tap water is safe to drink, US EPA and the California Department of Public Health prescribe regulations that limit the amount of certain contaminants in water provided by public water systems. Department of Public Health also establishes limits for contaminants in bottled water that must provide the same protection for public health.

CONTAMINANT HEALTH RISK INFORMATION

(Significance of Results)

The District has listed the following as a health risk informational guide only. Health risk assessments are based upon exceeding a Maximum Contaminant Level (MCL). The State allows us to monitor for some contaminants less than once per year because the concentrations of these contaminants do not change frequently. Some of our data, though representative, are more than one year old. Nitrate is routinely sampled within District pressure Zone 3A and District wells annually. None of these routine nitrate samples exceeded the MCL. Perchlorate was detected in five (5) groundwater sources. All of these sources have treatment systems installed for Perchlorate removal.

Nitrate: Nitrate in drinking water at levels above 45 mg/L is a health risk for infants of less than six months of age. Such nitrate levels in drinking water can interfere with the capacity of the infant's blood to carry oxygen, resulting in a serious illness; symptoms include shortness of breath and blueness of the skin. Nitrate levels above 45 mg/L may also affect the ability of the blood to carry oxygen in other individuals, such as pregnant women and those with certain specific enzyme deficiencies. If you are caring for an infant, or you are pregnant, you should ask advice from your health care provider.

Arsenic: (10 ppb) While your drinking water meets the current EPA standard for arsenic, it does contain low levels of arsenic. The standard balances the current understanding of arsenic's possible health effects against the costs of removing arsenic from drinking water. The California Department of Public Health continues to research the health effects of low levels of arsenic, which is a mineral known to cause cancer in humans at high concentrations and is linked to other health effects such as skin damage and circulatory problems. People who drink water containing arsenic in excess of the MCL over many years could experience skin damage or problems with their circulatory system, and may have an increased risk of getting cancer.

Gross Alpha Activity: Certain minerals are radioactive and may emit a form of radiation known as alpha radiation. Anyone who drinks water containing alpha emitters in the excess of the MCL over many years may have an increased risk of getting cancer.

Chromium: Those who use water containing chromium in excess of the MCL over many years may experience allergic dermatitis.

Combined Radium: Some people who drink water containing radium 226 or 228 in excess of the MCL over many years may have an increased risk of getting cancer.

Radon: Is a radioactive gas that you cannot see, taste, or smell. It is found throughout the U.S. Radon can move up through the ground and into a home through cracks and holes in the foundation. Radon can build up to high levels in all types of homes. Radon can also get into indoor air when released through tap water from showering, washing dishes, and other household activities. Compared to Radon entering the home through soil, Radon entering the home through tap water will in most cases be a small source of Radon in indoor air. Radon is a known human carcinogen. Breathing air containing Radon can lead to lung cancer. Drinking water containing Radon may also cause increased risk of stomach cancer. If you are concerned about Radon in your home, test the air in your home. Testing is inexpensive and easy. Fix your home if the level of Radon in your air is 4 picocuries per liter (pCi/L) or higher. There are simple ways to fix a Radon problem that are not too costly. For additional information, call your State Radon Program or call EPA's Radon Hotline (800-S0S-RADON).

Fluoride: Some people drink water containing fluoride in excess of the Federal MCL of 4 Mg/L over many years may get bone disease, including pain and tenderness of the bones. Children who drink water containing fluoride in excess of the State MCL of 2 Mg/L may get mottled teeth.

Total Organic Carbon (TOC): Total Organic Carbon (TOC) has no health effects. How ever, TOC provides a medium for the formation of disinfection by-products. These byproducts include trihalomethanes (THMs) and haloacetic acids (HAAs). Drinking water containing these by-products in excess of the MCL may lead to adverse health effects, liver or kidney problems, or nervous system effects and may lead to an increased risk of cancer. TOC result is based on quarterly RAA of percent removal ratio. Paired samples (one from source and the other from treated water) are collected monthly. The percent removal between source water and treated water is divided by the required monthly TOC percent removal based on certain criteria that all public water systems must follow.

Total Trihalomethanes (TTHMs) and Haloaceticacids (HAA5): Total Trihalomethanes (TTHMs) are the total of four trihalomethanes of concern in drinking water: chloroform, bromoform, bromodichloromethane, and chlorodibromomethane. In the Primary Standards Disinfection By-products section of the Water Quality Chart under System RAA from Distribution System, the highest area-wide Running Annual Average (RAA) for 2010 monthly sampling is 3.89 Ug/L, which is less than the Federal TTHM MCL of 80 Ug/L. These samples were taken from dedicated sample points within the distribution system and are representative of maximum residence time in the system. The federal TTHM MCL of 80mg/L (RAA) will be applicable to individual sampling points or locations by Year 2012 pursuant to a recently approved USEPA ruling.

The highest HAA5 individual result from quarterly sampling was 2.27 Ug/L, and the RAA of all quarterly samples, taken in 2010, was 1.82 Ug/L, well below the MCL of 60 Ug/L.

- **Health effects of Total Trihalomethanes (TTHMs):** Drinking water containing trihalomethanes in excess of the MCL over many years may experience liver, kidney, or central nervous system problems and may have an increased risk of getting cancer.
- **Health effects of Holoaceticacids (HAA5):** Drinking water containing HAA5's in excess of the MCL over many years may lead to an increased risk of getting cancer.

Tetrachloroethylene (PCE): Using water containing tetrachloroethylene in excess of the MCL over many years may lead to liver problems and an increased risk of getting cancer.

Aluminum: Those who drink water containing aluminum in excess of the MCL over many years may experience short-term gastrointestinal tract effects.

Perchlorate: Perchlorate has been shown to interfere with uptake of iodide by the thyroid gland, and to thereby reduce the production of thyroid hormones, leading to adverse affects associated with inadequate hormone levels. Thyroid hormones are needed for normal prenatal growth and development of the fetus, as well as for normal growth and development in the infant and child. In adults, thyroid hormones are needed for normal metabolism and mental function.

Este informe contiene información muy importante sobre su agua beber.

Tradúcalo ó hable con alguien que lo entienda bien.

VULNERABILITY OF DISTRICT WATER SOURCES

In 2002, the District, in partnership with the San Bernardino Valley Water Conservation District, conducted Source Water Assessments of all our drinking water wells. In May 2004, Source Water Assessments were also conducted for new District Wells No. 1A, 4A, and 54. No contaminants have been detected above the Maximum Contaminant Levels (MCL) set by California Department of Public Health; however sources are considered most vulnerable to the following:

Fecal Coliform and E. Coli Bacteria in our Source Water Supply. Heavy recreational activities in both Lytle Creek and Lake Silverwood during warm summer months increase the vulnerability.

Methyl Tertiary Butyl Ether (MTBE) sources located near gasoline service stations and underground gas storage tanks are vulnerable. A MTBE plume is leaching from the Colton Gasoline Storage Terminal. Two (2) District Wells are located south of the Terminal. Wells No. 40 and 41 are sampled monthly. No MTBE has ever been detected in these wells or any other District Well.

VOC & SOC Chemicals tested in all District groundwater wells were determined to be vulnerable to both Volatile Organic Chemicals (VOC's) and Synthetic Organic Chemicals (SOC's).

Nitrate in some groundwater wells are vulnerable. Nitrate contamination is the result of leaching septic systems and past citrus farming.

Perchlorate has been detected at low levels in six (6) groundwater wells (No's 11, 16, 17, 18A, 41, 42). Five of these wells are primary water sources and have treatment systems installed. It is believed that the likely sources for Perchlorate originate from former manufactures of rocket fuel/fireworks and fertilizer. (Wells 11, 16, 17, 18A & 42 now have Ion Exchange Systems installed for Perchlorate removal.

Cryptosporidium is a microbial pathogen found in surface water throughout the U.S. Although filtration removes Cryptosporidium, the most commonly-used filtration methods

cannot guarantee 100 percent removal. Our monitoring indicates the presence of these organisms in our source water and/or finished water. Current test methods do not allow us to determine if the organisms are dead or if they are capable of causing disease. Ingestion of Cryptosporidium may cause Cryptosporidiosis, an abdominal infection. Cryptosporidium may cause cryptosporidiosis, an abdominal infection. Symptoms of infection include nausea, diarrhea, and abdominal cramps. Most healthy individuals can overcome the disease within a few weeks. However, immune-compromised people are at greater risk of developing life-threatening illness. We encourage immune-compromised individuals to consult their doctor regarding appropriate precautions to avoid infection. Cryptosporidium must be ingested to cause disease, and it may be spread through means other than drinking water.

Completed Source Water Assessments may be viewed at your Districts Office located at:

855 West Base Line

Rialto, California 92376

Fun Facts

65,283
Population served

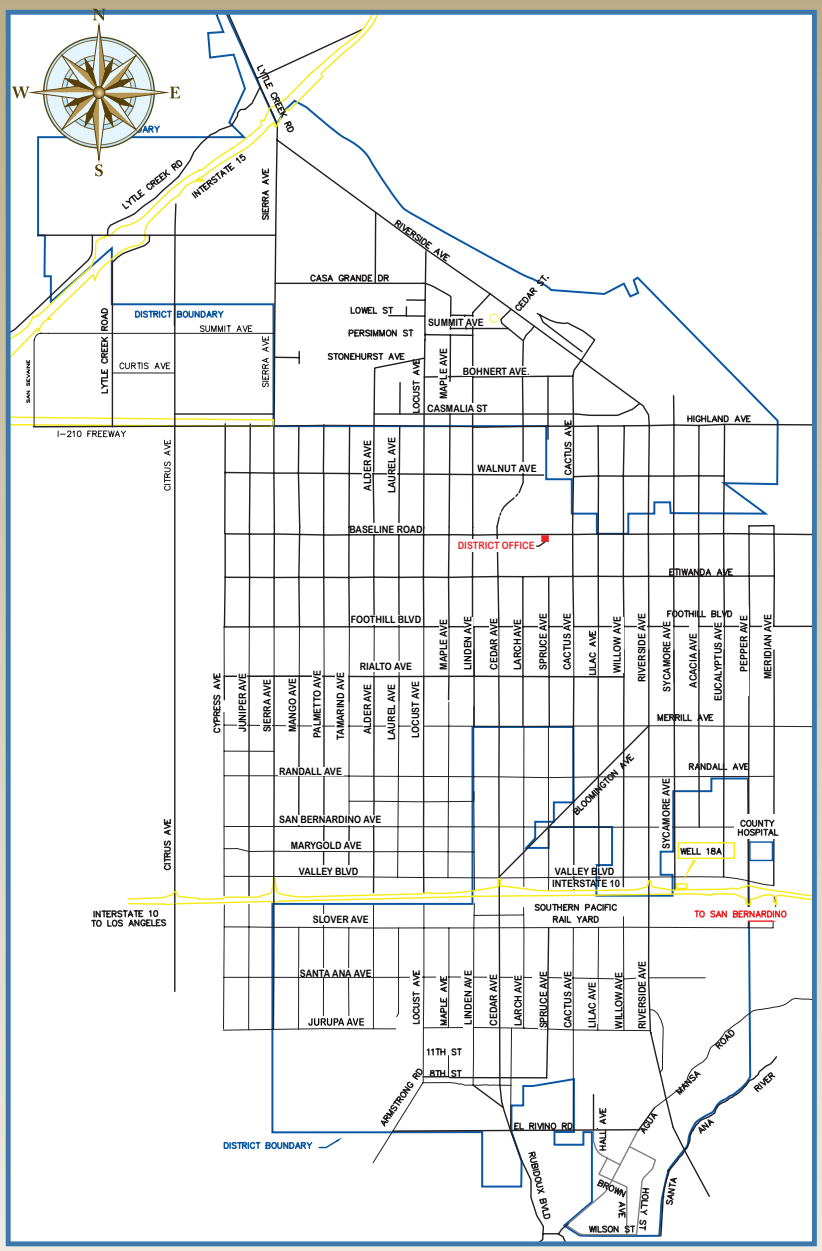
7031 Million
Gallons Annual Water Production

19.3 Million
Gallons Average Daily Water Demand

811 Million
Gallons Peak Production Month of August

3
Water Treatment Plants

SAFE WATER PROVIDED TO ALL SERVICE AREAS



The West Valley Water District provides water service to portions of Rialto, Colton, Fontana, the community of Bloomington and North Riverside County.

Our source of water comes from seventeen (17) groundwater wells that pump from the Lytle, Rialto, Bunkerhill and North Riverside aquifers. We also treat surface water from Lytle Creek in the San Bernardino Mountains, California State Project Water - Lake Silverwood. Your District routinely tests for contaminants from these sources in accordance with Federal and State Regulations.

WATER CONSERVATION...

A WAY OF LIFE IN SOUTHERN CALIFORNIA

The 2010/2011 rain season ends July 1st. This season's total rainfall at our District Headquarters was 25.47 inches. This is above last year's rainfall of 19.39 inches. Lower Lytle Creek had 48.97 inches and our South Shop had 24.07 inches. This will have a positive impact on our water wells pumping levels, although we must continue to practice water conservation. We live in an arid environment where droughts are common. Water is a precious commodity and using it wisely must always be a part of our daily lives in Southern California.

FOLLOW THESE TIME-OF-USE RULES WHEN WATERING YOUR LANDSCAPE:

Just any hour of the day may not be the best time to water your landscaping.

Watering during the hot afternoons is a sure way to get the least value for your water dollar. The sun will simply evaporate away the good you have done, and the afternoon winds will blow it away.

If you have sprinkler systems with timers, set them to run at night between 11 p.m. and 8 a.m., both summer and winter.

If you hand water, do so on weekends or holidays after 6 p.m. and before 8 a.m. both summer and winter.

Be water wise and energy wise-don't water during the day!

WEST VALLEY WATER DISTRICT

SOURCE OF SUPPLY: WELL WATER

District well water made up 61% of water delivered to District customers.

Radioactive Contaminants[(a)]

Contaminant	Violation Y/N	Highest Level Detected	Range	Unit of Measure	MCL	DLR	PHG	MCLG	Likely Source of Contamination
1. Gross Alpha Activity	N	4.7	<3.0-4.7	pCi/L	15	3.0	N/A	N/A	Erosion of natural deposits

(a) Effective 6/11/2006, the gross beta particle activity MCL is 4 millirem/year annual dose equivalent to the total body or any internal organ. 50 pCi/L is used as a screening level. We have not detected any gross beta activity in our system this year.

Inorganic Contaminants

2. Arsenic*	N	3.12	1.6-3.12	Ug/L	10	2.0	N/A	N/A	Erosion of natural deposits; runoff from orchards; glass and electronics production wastes
* Effective 1/23/2006, the federal arsenic MCL is 0.010 mg/L.									
3. Fluoride	N	.58	.16-.58	Mg/L	2	0.1	1	N/A	Erosion of natural deposits; water additive which promotes strong teeth; discharge from fertilizer and aluminum factories
4. Nitrate (NO3)	N	33	<2.0-33	Mg/L	45	2.0	45	N/A	Runoff and leaching from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits

Regulated Chemicals

Contaminant	Violation Y/N	Highest Level Detected	Range	Weighted Averages	Units	Secondary	DLR	Likely Source of Contamination
5. Perchlorate**	N	ND	ND	ND	Ug/L	6.0	6.0	Oxidant used in the manufacturing of solid rocket fuel and fire works

*Arsenic was detected above the maximum contaminate level (MCL) at the District Wells No. 2 and 36. Both Wells were taken out of service. A new Arsenic Treatment Plant has been constructed to remove Arsenic from Well No. 2. This Well source was put back in service in 2008. Water produced by Well No. 2 first goes through the treatment system prior to being delivered to customers. Well No. 36, although, not exceeding the four quarter running annual (RAA) average for Arsenic, was also inactivated. The District is investigating treatment technology for this source and has future plans to reactivate the well.

**Perchlorate has been detected at the low levels in seven (7) groundwater wells. Wells 11, 16, 17, 18A & 42 now have Ion Exchange Systems installed for Perchlorate removal.

Regulated Contaminants with Secondary MCL's

Contaminant	Violation Y/N	Highest Level Detected	Range	Weighted Averages	Units	Secondary MCL's	DLR	Likely Source of Contamination
6. Chloride	N	130	2.1-130	19.6	Mg/L	500	N/A	Runoff/leaching from natural deposits; seawater influence
7. Sulfate	N	26	18-26	21.0	Mg/L	500	0.5	Runoff/leaching from natural deposits; industrial wastes
8. TDS	N	330	190-330	234	Mg/L	1000	N/A	Runoff/leaching form natural deposits
9. Specific Conductance	N	560	290-560	380	Micromhos	1600 Micromhos	N/A	Substances that form ions when in water; seawater influence
10. Color	N	5	<1-5.0	5.0	Units of color	15 units	N/A	Naturally-occurring organic-materials
11. Iron	N	<.040	<.040	N/A	Mg/L	0.3	N/A	Leaching from natural deposits; industrial wastes.

Unregulated Contaminants

Contaminant	Violation Y/N	Highest Level Detected	Range	Weighted Averages	Units	MCL	DLR	Likely Source of Contamination
12. Hexavalent Chromium	N	1.6	1.6	1.6	Ug/L	No Standard	1.0	Discharge from factories chrome plating, leather tanning, wood preserving, dyes and pigments

Contaminant	Highest Level Detected	Range	Weighted Averages	Units	MCL
13. Sodium	19	9.1-19	12.00	Mg/L	No Standard
14. Tot. Hard	320	48-320	149	Mg/L	No Standard
15. Calcium	120	19-120	46.6	Mg/L	No Standard
16. Magnesium	11.00	.51-11.0	5.94	Mg/L	No Standard
17. Tot. Alkalinity	180	.52-180	111	Mg/L	No Standard
18. pH	8.27	6.0-8.27	7.9	Standard Units	No Standard
19. Potassium	3.2	1.5-3.2	2.2	Mg/L	No Standard

Nitrate (NO3) was detected at > 1/2 of the Maximum Contaminant Level (MCL) in District Wells 11 and 18A, but less than the MCL. State Regulations required quarterly sampling, the District conducts monthly sampling of this source. District Wells No. 22A and 37 were inactivated in 2007 for exceeding the Nitrate Mg/L. Infants below the age of six months who drink water containing nitrate in excess of the MCL may quickly become seriously ill and if untreated may die. Symptoms include shortness of breath and blue baby syndrome. Pregnant women who drink water containing nitrate in excess of the MCL may experience anemia. District Wells No. 34 and 36 were inactivated in 2007 due to Arsenic levels.

WEST VALLEY WATER DISTRICT

SOURCE OF SUPPLY: PURCHASED WELL WATER FROM THE CITY OF SAN BERNARDINO MUNICIPAL WATER DEPARTMENT/BASELINE FEEDER

The District purchased 14% of the water delivered to customers. This water is pumped from City of San Bernardino Well facilities.
These are the results of the weighted average from all wells pumping into the Encanto Booster station, which supplies water to West Valley Water District.

Radioactive Contaminants

Contaminant	Violation Y/N	Highest Level Detected	Range	Unit of Measure	MCL	DLR	PHG/ MCLG	Likely Source of Contamination
1. Gross Alpha	N	10.12	ND-10.12	pCi/L	15	N/A	N/A	Erosion of natural deposits
Inorganic Contaminants								
2. Fluoride	N	1.20	.27-1.20	Mg/L	2	0.1	1	Erosion of natural deposits; water additive which promotes strong teeth; discharge from fertilizer and aluminum factories
3. Nitrate (NO3)	N	29.0	2.20-29.0	Mg/L	45	2	45	Runoff and leaching from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits
Volatile Organic Contaminants (VOC's)								
4. Tetrachloroethylene (PCE)	N	2.20	ND-2.20	Ug/L	5	N/A	0.06	Leaching from PVC pipes; discharge from factories, dry cleaners and auto shops (metal degreaser)
5. Trichloroethylene (TCE)	N	.96	ND-.96	Ug/L	5	N/A	0.8	Discharge from metal degreasing site and other factories
Regulated Contaminants with Secondary MCL's								
Contaminant	**Violation Y/N**	**Highest Level Detected**	**Range**	**Weighted Averages**	**Units**	**DLR**	**Secondary MCL's**	**Likely Source of Contamination**
6. Sulfate	N	100	14.0-100	46.02	Mg/L	0.5	500	Runoff/leaching from natural deposits; industrial wastes

Other Contaminants

Contaminant	Highest Level Detected	Range	Weighted Averages	Units	MCL	
7. Sodium	48	13-48	20.25	Mg/L	No Standard	
8. Total Hardness	320	110-320	232.71	Mg/L	No Standard	
Contaminant	**Highest Level Detected**	**Range**	**Weighted Averages**	**Units**	**MCL**	
9. Hexavalent Chromium*	4.9	ND-4.9	1.44	Ug/L	No Standard	Unregulated Contaminant

*Last sampled 2009

Last year, as in years past, your tap water met all EPA and State Drinking Water Health Standards. West Valley Water District vigilantly safeguards its water supplies and once again, we are proud to report that our system has not violated any water quality standards. We tested for over 80 contaminants to ensure your water quality. This was not without a high expense. In 2010 water quality analysis costs were $166,986.26

WEST VALLEY WATER DISTRICT

SOURCE OF SUPPLY: SURFACE WATER

Local Lytle Creek water and California State Project water treated at the Oliver P. Roemer Water Filtration Facility made up 25% of water delivered to District customers.

Microbiological Contaminants

Contaminant	Violation Y/N	Highest Level Detected	Range	Unit of Measure	MCL	DLR	PHG	MCLG	Likely Source of Contamination
1. Effluent Turbidity*	N	.060	.040-.060	NTU	0.3-1	N/A	N/A	N/A	Soil runoff
Note: The annual monthly 95th percentile range was 0.060 to 0.080 NTU in 2008. This means that 95 percent of the (4) hours turbidity readings within the month were below the indicated range.									
2. Cryptosporidium**		0	0	oocyst/L	N/A	N/A	N/A	N/A	Human and animal fecal waste
**This result is from untreated California State Project Water that comes from Northern California via San Bernardino Valley Municipal Water District out of 24 samples from 4/17/07 through 3/17/09 only one sample detected Cryptosporidium. The weighted average value for all Cryptosporidium samples taken was .004 oocyst Per liter. The District uses ultra violet (UV) disinfection when ever State Project Water is treated at the O.P. Roemer Water Filtration Facility.									
Inorganic Contaminants									
3. Aluminum***	N	170	61-170	Ug/L	1000	50	N/A	N/A	Residue from surface water treatment process
Disinfection By-Products									
Tthm and HAA5 analysis are conducted quarterly within the Distribution System, results listed in this report represents a four quarter running weighted average for the year 2010. The 4 quarter running average for Tthm = 3.89 Ug/L and HAA5=1.82 Ug/L.									
4. Total Trihalomethanes (TThm)	N	4.74	2.47-4.74	Ug/L	60	N/A	N/A	N/A	By-product of drinking water chlorination
5. Haloacetic Acids (HAA5)	N	2.27	1.18-2.27	Ug/L	40	N/A	N/A	N/A	By-product of drinking water chlorination

Initial Distribution System Monitoring (***) (Disinfection By-Products)

Contaminant	Violation Y/N	Highest Level Detected	Range	Highest Locational Running Annual Average (LRAA)
6. Total Trihalomethanes (TThm)****	N/A	4.74	2.47-4.74	3.89
7. Haloacetic Acids (HAA5)***	N/A	2.27	1.18-2.27	1.82

Regulated Contaminants with Secondary MCL's

Contaminant	Violation Y/N	Highest Level Detected	Range	Units	Secondary MCL's	DLR	Likely Source of Contamination
8. Aluminum***	N	170	61-170	Ug/L	200	50	Erosion of natural deposits; Residue from surface water treatment process
9. Chloride	N	8.5	4.3-8.5	Mg/L	500	N/A	Runoff/leaching from natural deposits; sea water influence
10. Sulfate	N	25	25	Mg/L	500	0.5	Runoff/leaching from natural deposits; sea water influence
11. TDS	N	220	220	Mg/L	1000	N/A	Runoff/leaching from natural deposits
12. Specific Conductance	N	340	340	Micromhos	1600	N/A	Substances that form ions when in water; seawater influence

*Turbidity is a measure of the cloudiness of the water. We monitor it because it is a good indicator of the effectiveness of our filtration system.
**Source water monitoring for the Long Term 2 Enhanced Surface Water Treatment Rule (LT2 Rule) Cryptosporidium/E. Coli analyses was completed in 2009.
***The weighted running annual average (RAA) for Aluminum leaving Oliver P. Roemer Water Filtration Facility was 110 Ug/L in year 2010. This is an aesthetic standard that does not pose a risk to public health (see definition for secondary standard). To reduce Aluminum in the effluent water, Plant Staff regularly balances our primary coagulant chemical (Aluminum Sulfate) with treatment equipment at the facility. Secondary MCLs do not have PHGs/MCLGs because secondary MCLs are set to protect the aesthetics of water and PHGs/MCLGs are based on health concerns.
****An Initial Distribution System Evaluation (IDSE) is required as part of Stage 2 Disinfectants and Disinfection By-products Rule (DBPR). IDSEs are an important part of the Stage 2 DBPR. They are one-time studies conducted by water systems to identify distribution system locations with high concentrations of trihalomethanes (THMs) and haloacetic acids (HAAs). The District will use results from the IDSE, in conjunction with their Stage 1 DBPR compliance monitoring data, to select compliance monitoring locations for the new Stage 2 DBPR. Recently the District has initiated site specific locational Running Annual Averages reporting results for the Stage 2 DBPR.

Other Contaminants

Contaminant	Highest Level Detected	Range	Units	MCL
11. Sodium	19	9.1-19	Mg/L	No Standard
12. Total Hardness	160	160	Mg/L	No Standard
13. Calcium	120	19-120	Mg/L	No Standard
14. Magnesium	8.4	8.4	Mg/L	No Standard
15. Total Alkalinity	150	150	Mg/L	No Standard
16. pH	8.2	7.10-8.2	Standard Units	No Standard
17. Potassium	2.1	2.1	Mg/L	No Standard

DISTRIBUTION SYSTEM

These tables reflect combined water quality of all sources.

Contaminant	Violation Y/N	Highest Level Detected	Range	Unit of Measure	MCL	PHG	MCLG	Likely Source of Contamination
Microbiological Contaminants								
1. Total Coliform Bacteria	N	0.3%	0.3%	Present Absent (P/A)	Presence of coliform bacteria in 3% of monthly samples	N/A	0	Naturally present in the environment (Note: 973 samples required; District took 1904 samples)
Inorganic Contaminants								
1. Nitrate	N	19	6.19-19	Mg/L	45	45	N/A	Runoff and leaching from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits
2. Fluoride	N	0.65	.28-.65	Mg/L	2	1	N/A	Erosion of natural deposits; water additive which promotes strong teeth; discharge from fertilizer and aluminum factories
Tri Annual Lead & Copper Monitoring- August 2006								
1. Lead*	N	90th Percentile 1.9Ug/L	ND-4.0	Ug/L	15 (AL)	2	N/A	Internal corrosion of household water plumbing systems; discharges from industrial manufacturers; erosion of natural deposits
2. Copper*	N	90th Percentile 140 Ug/L	13-160	Ug/L	1300 (AL)	170	N/A	Industrial corrosion of household plumbing systems; erosion of natural deposits; leaching from wood preservatives

*Lead and Copper analysis is conducted at thirty (30) households within the District, on a Tri Annual schedule as mandated by the California Department of Health Services. Last testing was conducted in July 2009. Next Tri Annual monitoring is scheduled for July 2012.
Lead: Infants and children who drink water containing lead in excess of the (AL) may experience delays in their physical or mental development. Children may show slight deficits in attention span and learning abilities. Adults who drink this water over many years may develop kidney problems or high blood pressure.
Copper: Copper is an essential nutrient, but some people who drink water containing Copper in excess of the (AL) over a relatively short amount of time may experience gastrointestinal distress. Some people who drink water containing copper in excess of the (AL) over many years may suffer liver or kidney damage. People with Wilson's Disease should consult their personal doctor.

Regulated Contaminants with Secondary Standards

Contaminant	Violation Y/N	Highest Level Detected	Range	Unit of Measure	Weighted Averages	Secondary MCL's	Likely Source of Contamination
1. Chloride (CL)	N	130	2.1-130	Mg/L	19.6	500	Runoff/leaching from natural deposits; sea water influence
2. Sulfate (SO4)	N	28	21-28	Mg/L	24	500	Runoff/leaching from natural deposits; industrial wastes
3. Specific Conductance	N	440	340-440	Micromhos	390	1600	Substances that form ions when in water; seawater influence
4. TDS	N	200	190-220	Mg/L	201	1000	Runoff/leaching from natural deposits

Other Contaminants

Contaminant	Violation Y/N	Highest Level Detected	Range	Unit of Measure	Weighted Averages	Secondary MCL's
1. Calcium	N	72	43-72	Mg/L	55.7	No Standard
2. Magnesium	N	7.9	6.6-7.9	Mg/L	7.2	No Standard
3. Potassium	N	38	ND-38	Mg/L	3.8	No Standard
4. Sodium	N	19	13-19	Mg/L	15	No Standard
5. Total Hardness	N	200	140-200	Mg/L	170	No Standard
6. Total Alkalinity	N	180	120-180	Mg/L	149	No Standard
7. pH	N	8.40	7.5-8.4	Mg/L	7.9	No Standard
8. Bicarbonate	N	190	52-190	Mg/L	119	No Standard

Regulated Chemicals

Contaminant	Violation Y/N	Highest Level Detected	Range	Unit of Measure	Weighted Averages	MCL Secondary MCL's	PHG
9. Perchlorate*	N	ND	ND	Ug/L	ND	6.0 Ug/L	6.0 Ug/L

* West Valley Water District conducts Perchlorate monitoring at 30 locations.

Ways To Conserve Water And Save Money

These tips are easy and can help conserve water for the future, save you money and help the environment.

Indoor tips:

- Never put water down the drain when it can be used for watering plants or a garden.
- Verify the home leak free. Have the pipes checked for leaks.
- Repair dripping faucets by replacing washers. A faucet dripping at the rate of one drop per second wastes 2,700 gallons in one year.
- Avoid flushing the toilet unnecessarily. Dispose of tissues and insects in the trash.
- Take short showers. Showers lasting less than five minutes will save up to 1,000 gallons a month. Replace the showerhead with an ultra-flow version.
- Install low-volume toilets.
- Don't let the water run while washing, shaving or brushing your teeth. Turning off the water while brushing your teeth saves four gallons a minute. That equals 200 gallons a week for a family of four.
- Retrofit faucets with aerators with flow restrictors.
- Operate automatic dishwashers and clothes washers when fully loaded or when properly set for correct water level.
- Don't use running water to thaw frozen foods.
- Start a compost pile. Skip using the kitchen sink disposal, which requires water to operate properly.
- Insulate hot water pipes.
- Dump leftover ice from cups on a plant.
- Don't let the water run while washing hands.

Outdoor tips:

- Avoid planting turf in areas that are hard to water.
- Water only during morning hours to minimize evaporation.
- Use a broom instead of a hose to clean driveways or sidewalks. This saves 80 gallons of water each time.
- Adjust the lawn mower to a higher setting. Longer grass shades root systems and holds soil moisture better.
- Direct downspouts and other runoff toward shrubs and trees, or collect and use in the garden.
- Use a commercial car wash that recycles water.
- Buy a rain gauge to track irrigation needs.
- Xeriscape with drought resistant trees, plants and groundcover.
- Use a hose nozzle and turn off the water when not using it.

Water Facts

- **A slow dripping faucet can waste as much as 15 gallons a day.**
- **An extra five minutes in the shower uses as much as 25 gallons.**
- **It takes 660 gallons of water to supply 1,000 square feet of lawn with 1 inch of water.**
- **Turning off the water while brushing your teeth saves 4 gallons a minute.**
- **Using new water-saving appliances like washing machines can save up to 20 gallons per load.**
- **A dishwasher uses 25 gallons for a full cycle.**

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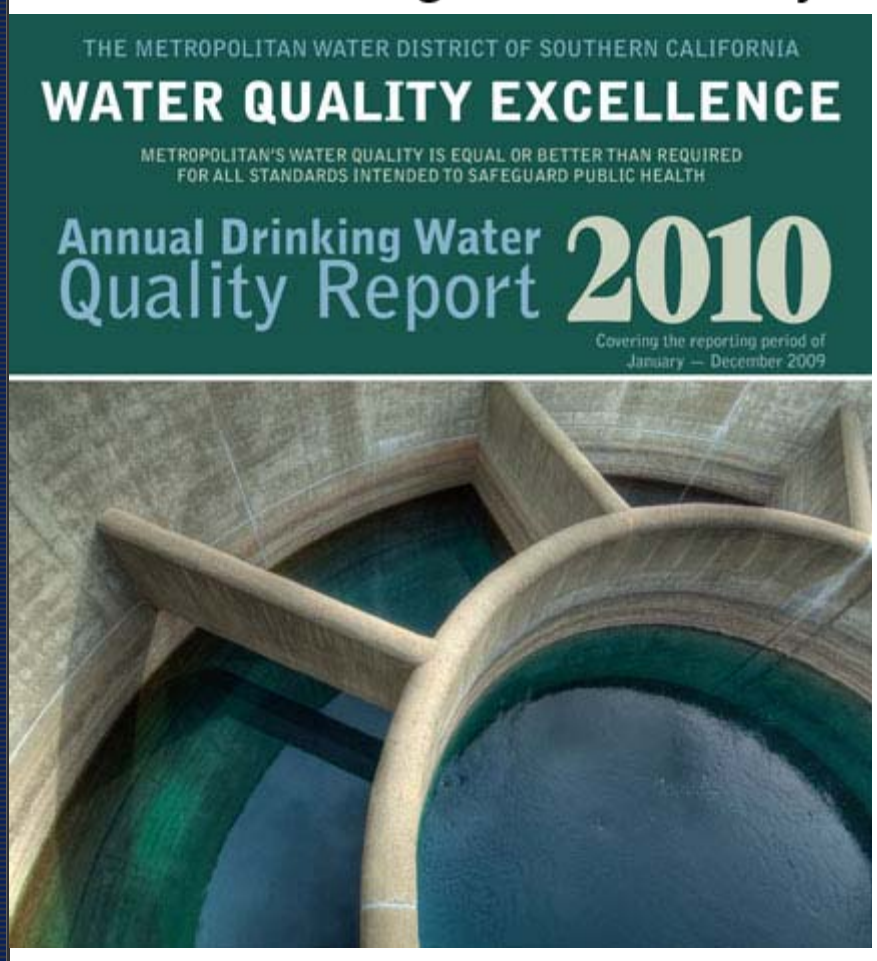
Report prepared by District Staff: Ernie Montelongo, Angela Navarro, Maria Guerrero & Ken Sikorski

Annual Drinking Water Quality Report



A Letter from the Chairman

Click here for a message from Timothy F. Brick, Chairman, Metropolitan Board of Directors.

Drinking Water & Your Health

Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that the water poses a health risk. Learn more (497 Kb pdf)*

Click here for a health advisory for people with weakened immune systems. (537 Kb pdf)*

Protecting Water at the Source

Source water protection is an important issue for all of California. Large water utilities are required by the California Department of Public Health to conduct a Watershed Sanitary Survey every five years to examine possible sources of drinking water contamination ... Learn more

Water Quality Report Tables

- 2009 Water Quality Table (418 Kb pdf)*
- Other Detected Constituents That May Be of Interest to Consumers (420 Kb pdf)*
- Readers Guide to the Water Quality Table (1,250 Kb pdf)*
- 2010 Reporte Anual de la Calidad del Agua (2,810 Kb pdf)*

Additional Resources

California Department of Health Services Office of Drinking Water
601 N. 7th St.
Sacramento, CA 94234-7320

U.S. Environmental Protection Agency
Ariel Rios Building
1200 Pennsylvania Avenue, NW
Washington, DC 20460-0003
Safe Drinking Water Hotline (800) 426-4791

General drinking water information

Information on how drinking water standards are set

* All PDF documents on this site require Adobe Acrobat Reader 4.0 or higher. If you do not have Adobe Acrobat Reader, or must upgrade your version, you may download it for free from Adobe's Web site. If you are using a dial-up modem, please note that many of these documents are large in size and take a long time to open. Use of software other than Adobe Reader may cause discrepancies from the original documents. These risks will be assumed by the reader.

Readers Guide to the Water Quality Table

The cornerstone of the water quality report is a table that lists the results of year-round monitoring for more than 120 constituents. Only the constituents that are found are listed in the table.

By reading the table from left to right, you will learn the quantity of a constituent found in Metropolitan's water and how that compares with the allowable state and federal limits. You will also see the range and average of the constituent measured as well as its origin.

The questions and answers on this page lettered A through I, will explain the important elements of the table.

A

What are the sources of the water Metropolitan delivers?

Metropolitan imports water from both the San Francisco-San Joaquin Bay-Delta via the State Water Project, and the Colorado River via the Colorado River Aqueduct. The table shows the percentage of the total water delivered by Metropolitan that is from the State Water Project. The remainder is from the Colorado River.

B

What is in my drinking water?

Your water may contain different types of chemicals (organic and inorganic), microscopic organisms (e.g., bacteria, algae, protozoa, and viruses) and radioactive materials (radionuclides), many of which are naturally-occurring. Health agencies require monitoring for these constituents, because at certain levels they could result in short- and long-term health risks. The column marked "Parameter" lists the constituents found in the water from Metropolitan's treatment plants.

C

How are constituents reported?

"Units" describe how a constituent is reported. Usually constituent levels are measured in extremely tiny quantities such as a part per million, part per billion and in some cases, part per trillion. Even small concentrations of certain constituents can be a health concern. That is why regulatory standards are set at very low levels for certain constituents.

D

What are the maximum allowed levels for constituents in drinking water?

Health agencies have maximum contaminant levels (MCLs) for constituents so that drinking water is safe and looks, tastes and smells good. A few constituents have the letters "TT" in the MCL column because they do not have a numerical MCL. Instead, they have certain treatment requirements that have to be met to reduce their levels in drinking water. One of the constituents, total chlorine residual, has an MRDL (maximum residual disinfection level) instead of an MCL. The MRDL is the level of a disinfectant added for water treatment that may not be exceeded at the consumer's tap. While disinfectants are necessary to kill harmful microbes, drinking water regulations protect against too much disinfectant being added. Another constituent, turbidity, has a requirement that 95 percent of the measurements taken must be below a certain number. Turbidity is a measure of the cloudiness of the water. We monitor it because it is a good indicator of the efficiency of our filtration system.

E

Why are some of the constituents listed in the section labeled "Primary Standards" and others in the "Secondary Standards" section?

Constituents that are grouped in the primary standards section may cause health problems at certain levels. In general, if the average amount of a constituent is greater than the MCL, the water may not be safe to drink.

Constituents that are grouped under the secondary standards section can affect the appearance, taste and smell of water. These substances do not affect the safety of the water unless they also have a primary standard. Some constituents (e.g., aluminum) have two different MCLs, one for health-related impacts, and another for non-health-related impacts.

F

What are Public Health Goals and Maximum Contaminant Level Goals?

PHGs and MCLGs are targets or goals set by regulatory agencies for the water industry. They define a constituent level in the water that does not pose any significant threat to health. It is oftentimes not possible to remove or reduce constituents to the level of PHGs and MCLGs because it is technologically impossible or the cost for treatment is so expensive that it would make tap water unaffordable. That is why PHGs and MCLGs are considered goals to work toward, and not realistic standards that can be enforced.

G

How do I know how much of a constituent is in my water and if it is at a level that is safe?

With a few exceptions **, if the AVERAGE amount of a constituent found in tap water over the course of a year is no greater than the MCL, then the regulatory requirements are considered to be satisfied. The highest and very lowest levels measured over a year are shown in the RANGE. Requirements for safety, appearance, taste and smell are based on the AVERAGE levels recorded and not the RANGE.

Water agencies have specific procedures to follow if a constituent is found at levels higher than the MCL and considered a potential threat to public health. News is shared immediately with the regulatory agencies and broadcast to the public, usually via the news media. If there is no health threat but standards are exceeded, the situation is reported to the regulatory agencies and noted in the annual water quality report.

**Some constituents have special rules described in the footnotes to the water quality table. Constituents that have the letters "TT" instead of a numerical MCL meet the drinking water standard if there is also a "TT" in the columns designated as "H."

H

What are the testing results for each of Metropolitan's treatment plants?

Metropolitan operates five water treatment plants to treat and disinfect water from Northern California and the Colorado River. The monitoring results for the water delivered by each of the plants are listed. Typically the F.E. Weymouth Water Treatment Plant serves parts of Los Angeles County, the San Gabriel Valley and areas of Orange County. The Robert B. Diemer Water Treatment Plant also provides treated water to areas of Orange County and coastal Los Angeles. The Joseph Jensen Water Treatment Plant supplements local water supplies in the San Fernando Valley, Ventura County and Central Los Angeles. The Robert A. Skinner Water Treatment Plant serves western Riverside County, Moreno Valley and San Diego County. Finally, the Henry J. Mills Water Treatment Plant also serves western Riverside County and Moreno Valley.

I

How do constituents get into the water supply?

The most likely source for each constituent is listed in the last column of the table. Some constituents are natural and come from the environment, others come from cities and farms, and some result from the water disinfection process itself. Some chemicals have found their way into California's water supplies, making water treatment more difficult. Certain industrial processes -- like dry cleaning, fireworks and rocket fuel manufacturing – have left constituents in the environment, as has the use of certain fertilizers and pesticides. Many of these chemicals have since been banned from use.

2009 Water Quality Table

	B	C	D	F	G	H					I
						Treatment Plant Effluent					
	Parameter	Units	State MCL [MRDL]	PHG (MCLG) [MRDLG]	Range Average	Weymouth Plant	Diemer Plant	Jensen Plant	Skinner Plant	Mills Plant	Major Sources in Drinking Water
A	Percent State Project Water	%	NA	NA	Range **Average**	0 - 34 12	3 - 34 14	100 100	6 - 52 20	100 100	NA
E	**PRIMARY STANDARDS - Mandatory Health-Related Standards**										
	CLARITY										
	Combined Filter Effluent Turbidity	NTU %	0.3 95 (a)	NA	Highest **% < 0.3**	0.06 100	0.06 100	0.06 100	0.08 100	0.18 100	Soil runoff
	MICROBIOLOGICAL										
	Total Coliform Bacteria (b)	%	5.0	(0)	Range **Average**	**Distribution System-wide:** 0 - 0.2 **Distribution System-wide:** 0					Naturally present in the environment
	Heterotrophic Plate Count (HPC) (c)	CFU/mL	TT	NA	Range **Average**	**Distribution System-wide:** TT **Distribution System-wide:** TT					Naturally present in the environment
	ORGANIC CHEMICALS										
	Acrylamide	NA	TT	(0)	Range **Average**	TT TT	TT TT	TT TT	TT TT	TT TT	Water treatment chemical impurities
	Epichlorohydrin	NA	TT	(0)	Range **Average**	TT TT	TT TT	TT TT	TT TT	TT TT	Water treatment chemical impurities
	INORGANIC CHEMICALS										
	Aluminum (d)	ppb	1,000	600	Range **Highest RAA**	110 - 240 160	100 - 230 170	ND - 100 76	ND ND	ND - 160 96	Residue from water treatment process; natural deposits erosion
	Arsenic	ppb	10	0.004	Range **Highest RAA**	ND - 2.5 2.2	ND - 2.6 2.3	2.5 - 3.9 3.1	ND ND	ND - 3.4 2.6	Natural deposits erosion; glass and electronics production wastes
	Barium	ppb	1,000	2,000	Range **Average**	110 - 140 120	120 - 140 130	ND ND	ND - 110 ND	ND ND	Oil and metal refineries discharge; natural deposits erosion
	Fluoride (e) (treatment-related)	ppm	2.0	1	Control Range **Optimal Fluoride Level**	0.7 - 1.3 0.8	0.7 - 1.3 0.8	0.7 - 1.3 0.8	0.7 - 1.3 0.8	0.6 - 1.2 0.7	Water additive for dental health
					Range **Average**	0.7 - 1.0 0.8	0.7 - 0.9 0.8	0.6 - 0.9 0.8	0.7 - 1.0 0.8	0.5 - 0.9 0.7	
					Range	**Distribution System-wide:** 0.6 - 1.0					
	Nitrate (as N) (f)	ppm	10	10	Range **Highest RAA**	ND - 0.4 0.4	ND - 0.4 0.4	0.6 - 0.9 0.8	ND - 0.4 ND	ND - 0.8 0.6	Runoff and leaching from fertilizer use; sewage; natural deposits erosion
	RADIONUCLIDES (g)										
	Gross Alpha Particle Activity	pCi/L	15	(0)	Range **Average**	ND - 7.6 5.2	3.8 - 9.3 5.6	ND - 7.3 3.4	3.3 - 4.3 3.6	ND - 5.5 ND	Erosion of natural deposits
	Gross Beta Particle Activity (h)	pCi/L	50	(0)	Range **Average**	ND - 9.7 4.2	ND - 6.4 4.3	ND - 5.2 ND	ND - 8.8 ND	ND - 7.5 ND	Decay of natural and man-made deposits
	Uranium	pCi/L	20	0.43	Range **Average**	2.4 - 3.4 2.9	2.9 - 3.7 3.3	1.6 - 2.0 1.8	2.3 - 2.7 2.5	1.5 - 2.8 2.1	Erosion of natural deposits
	DISINFECTION BY-PRODUCTS, DISINFECTANT RESIDUALS, AND DISINFECTION BY-PRODUCTS PRECURSORS (i)										
	Total Trihalomethanes (TTHM) (j)	ppb	80	NA	Range **Average**	25 - 67 43	26 - 56 43	17 - 33 28	26 - 56 41	20 - 33 25	By-product of drinking water chlorination
	Total Trihalomethanes (TTHM) (j)	ppb	80	NA	Range **Highest RAA**	**Distribution System-wide:** 15 - 81 **Distribution System-wide:** 39					By-product of drinking water chlorination
	Haloacetic Acids (five) (HAA5) (k)	ppb	60	NA	Range **Average**	5.6 - 20 11	7.3 - 12 10	2.0 - 3.2 2.5	9.9 - 15 12	2.3 - 7.0 4.3	By-product of drinking water chlorination
	Haloacetic Acids (five) (HAA5) (k)	ppb	60	NA	Range **Highest RAA**	**Distribution System-wide:** 1.5 - 30 **Distribution System-wide:** 14					By-product of drinking water chlorination
	Total Chlorine Residual	ppm	[4.0]	[4.0]	Range **Highest RAA**	**Distribution System-wide:** 1.5 - 3.0 **Distribution System-wide:** 2.4					Drinking water disinfectant added for treatment
	Bromate (l)	ppb	10	0.1	Range **Highest RAA**	NA NA	NA NA	4.2 - 12 6.9	NA NA	3.9 - 12 8.0	By-product of drinking water ozonation
	DBP Precursor Control (TOC)	ppm	TT	NA	Range **Average**	TT TT	TT TT	TT TT	TT TT	TT TT	Various natural and man-made sources
E	**SECONDARY STANDARDS - Aesthetic Standards**										
	Aluminum (d)	ppb	200	600	Range **Highest RAA**	110 - 240 160	100 - 230 170	ND - 100 76	ND ND	ND - 160 96	Residue from water treatment process; natural deposits erosion
	Chloride	ppm	500	NA	Range **Highest RAA**	89 - 100 98	89 - 99 97	77 - 82 79	93 - 100 97	67 - 99 85	Runoff/leaching from natural deposits; seawater influence
	Color	Units	15	NA	Range **Highest RAA**	1 - 2 2	1 - 2 2	1 - 2 2	1 - 2 2	1 - 2 2	Naturally occurring organic materials
	Odor Threshold (m)	TON	3	NA	Range **Average**	2 2	2 2	2 2	**12 - 24** **18**	2 2	Naturally occurring organic materials
	Specific Conductance	µS/cm	1,600	NA	Range **Highest RAA**	850 - 1,100 1,000	880 - 1,100 1,000	570 - 610 590	760 - 1,100 960	460 - 670 590	Substances that form ions in water; seawater influence
	Sulfate	ppm	500	NA	Range **Highest RAA**	180 - 260 240	190 - 250 240	56 - 70 66	130 - 250 220	32 - 77 68	Runoff/leaching from natural deposits; industrial wastes
	Total Dissolved Solids (TDS)	ppm	1,000	NA	Range **Highest RAA**	510 - 660 620	530 - 640 610	310 - 340 330	440 - 640 580	250 - 380 330	Runoff/leaching from natural deposits; seawater influence
	Turbidity (a)	NTU	5	NA	Range **Highest RAA**	0.05 - 0.06 0.06	0.04 - 0.05 0.04	0.04 - 0.05 0.04	0.04 - 0.05 0.05	0.05 - 0.08 0.06	Soil runoff

ABBREVIATIONS AND DEFINITIONS

CFU/mL	Colony-Forming Units per milliliter	pCi/L	picoCuries per liter
DBP	Disinfection By-Products	PHG	Public Health Goal - The level of a contaminant in drinking water below which there is no known or expected risk to health. PHGs are set by the California Environmental Protection Agency.
MCL	Maximum Contaminant Level - The highest level of a contaminant that is allowed in drinking water. Primary MCLs are set as close to the PHGs (or MCLGs) as is economically and technologically feasible. Secondary MCLs are set to protect the odor, taste, and appearance of drinking water.	ppb	parts per billion or micrograms per liter (µg/L)
		ppm	parts per million or milligrams per liter (mg/L)
MCLG	Maximum Contaminant Level Goal - The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs are set by the U.S. Environmental Protection Agency (USEPA).	RAA	Running Annual Average
MRDL	Maximum Residual Disinfectant Level - The highest level of a disinfectant allowed in drinking water. Addition of a disinfectant is necessary for control of microbial contaminants.	TOC	Total Organic Carbon
MRDLG	Maximum Residual Disinfectant Level Goal - The level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.	TON	Threshold Odor Number
N	Nitrogen	TT	Treatment Technique - A required process intended to reduce the level of a contaminant in drinking water.
NA	Not Applicable	µS/cm	microSiemen per centimeter; or micromho per centimeter (µmho/cm)
ND	Not Detected	Primary Standards (Primary Drinking Water Standards) - MCLs and MRDLs for contaminants that affect health along with their monitoring and reporting requirements, and water treatment requirements.	
NTU	Nephelometric Turbidity Units	Secondary Standards - Requirements that ensure the appearance, taste and smell of drinking water are acceptable.	

FOOTNOTES

(a) The turbidity level of the filtered water shall be less than or equal to 0.3 NTU in 95% of the measurements taken each month and shall not exceed 1 NTU at any time. Turbidity is a measure of the cloudiness of the water and is an indicator of treatment performance. The averages and ranges of turbidity shown in the Secondary Standards were based on the treatment plant effluent.

(b) Total coliform MCLs: No more than 5.0% of the monthly samples may be total coliform-positive. Compliance is based on the combined distribution system sampling from all the treatment plants. In 2009, 8116 samples were analyzed and two samples were positive for total coliforms. The MCL was not violated.

(c) All distribution system samples collected had detectable total chlorine residuals and no HPC was required. HPC reporting level is 1 CFU/mL.

(d) Aluminum has both primary and secondary standards.

(e) Metropolitan was in compliance with all provisions of the State's Fluoridation System Requirements.

(f) State MCL is 45 mg/L as nitrate, which is the equivalent of 10 mg/L as N.

(g) Data collected from four consecutive quarters of monitoring in 2008.

(h) The gross beta particle activity MCL is 4 millirem/year annual dose equivalent to the total body or any internal organ. The screening level is 50 pCi/L.

(i) Metropolitan was in compliance with all provisions of the Stage 1 Disinfectants/ Disinfection By-Products (D/DBP) Rule. Compliance was based on the RAA.

(j) Reporting level is 0.5 ppb for each of the following: bromodichloromethane, bromoform, chloroform, and dibromochloromethane.

(k) The detection limit for purposes of reporting is 1.0 ppb for each of the following: dichloroacetic acid, trichloroacetic acid, monobromoacetic acid, and dibromoacetic acid; and 2.0 ppb for monochloroacetic acid.

(l) Bromate reporting level is 3 ppb.

(m) Data based on the State-required quarterly monitoring following MCL exceedance. Metropolitan utilizes a flavor-profile analysis (FPA) method that can detect odor occurrences more accurately and found the FPA samples from this location acceptable. No taste and odor event was observed and no complaints were received during the period.

Annual Drinking Water Quality Report

2010

Covering the period from January through December 2009, our annual water quality report provides a snapshot of important information about your drinking water. ***Western's water is safe and healthy to drink and meets all water quality standards.*** For those individuals with special health concerns, please refer to page 5.

Note: Industrial and commercial users, including hospitals, medical centers and health clinics, please forward this report to your Environmental Compliance Manager.

Éste informe contiene información muy importante sobre su agua potable. Tradúzcalo o hable con alguien que lo entienda bien. Si desea más informacion, por favor contacte a Public Affairs en Western Municipal Water District, 951.789.5000 or en water@wmwd.com

Securing Your Water Supply

WESTERN MUNICIPAL WATER DISTRICT

450 E. Alessandro Blvd., Riverside, CA 92508

Securing Your Water Supply

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Securing Your Water Supply

Éste informe contiene información muy importante sobre su agua potable. Tradúzcalo o hable con alguien que lo entienda bien. Si desea más informacion, por favor contacte a Public Affairs en Western Municipal Water District, 951.776.4519 or en water@wmwd.com

Western's Annual Drinking Water Quality Report for 2009 contains a detailed summary of our water quality monitoring and testing.

Western Municipal Water District is pleased to present the report to you, our consumers, and note that our water supply meets all drinking water quality standards. The U.S. EPA and the California Department of Public Health (CDPH) require that all water agencies produce an annual water quality report for customers about their drinking water. Flipping through the pages, you'll find important information about the origin of your water, the composition of your water and the steps we take to protect your health and safety with our water treatment process and water quality monitoring and testing. It's important to know that the production and mailing of this report is mandatory and efforts have been made to keep costs down.

If you have any questions about this report or water quality, please contact our Public Affairs Office at 951.776.4519 or visit us on the web at wmwd.com.

"Western's water is safe and healthy to drink and meets all water quality standards."

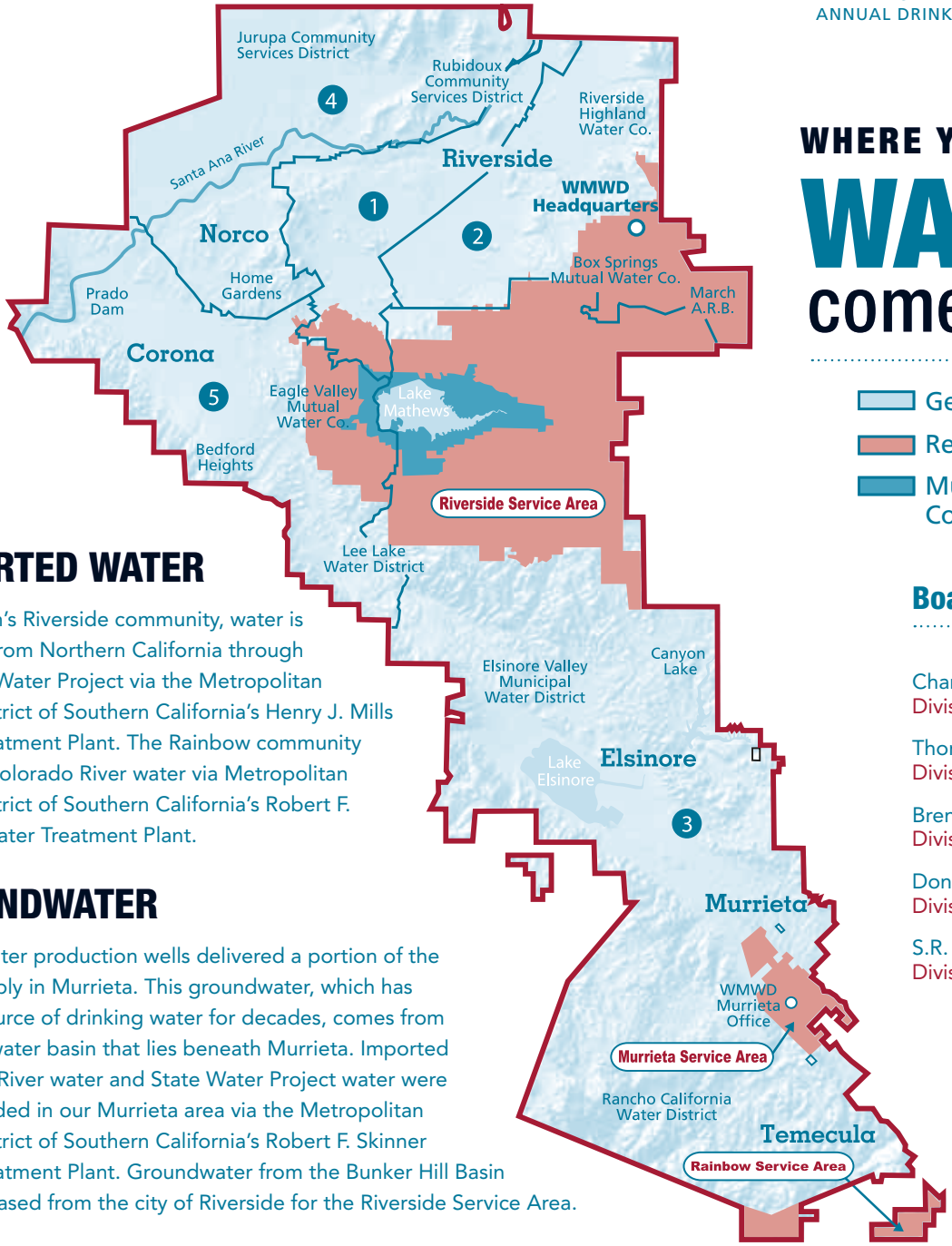
Why is There Anything in My Water?

Sources of drinking water (both tap and bottled) include rivers, lakes, streams, ponds, reservoirs, springs and wells. As water travels over the surface of the land or through the ground, it dissolves-naturally occurring minerals, and can pick up substances resulting from the presence of animals or from human activity. Contaminants that may be present in source water due to these activities include:

- ***Microbial contaminants***, such as viruses and bacteria that may come from sewage treatment plants, septic systems, agriculture, livestock operations and wildlife.
- ***Inorganic contaminants***, such as salts and metals, that can be naturally occurring or result from urban storm water runoff, industrial or domestic wastewater discharges, oil and gas production, mining or farming.
- ***Pesticides and herbicides***, which may come from a variety of sources such as agriculture, urban storm water runoff and residential uses.
- ***Organic chemical contaminants***, including synthetic and volatile organic chemicals that are by-products of industrial processes and petroleum production, and can also come from gas stations, urban storm water runoff, agricultural application and septic systems.
- ***Radioactive contaminants***, which can be naturally-occurring or the result of oil and gas production and mining activities.

In order to ensure that tap water is safe to drink, the U. S. EPA and the California Department of Public Health (CDPH) prescribe regulations that limit the amount of certain contaminants in water provided by public water systems. The U.S. Food and Drug Administration regulates bottled water. For more information, log onto the Department web site at: www.cdph.ca.gov.

WHERE YOUR WATER comes from



General District
Retail District
Multi-Species Habitat Conservation Plan

IMPORTED WATER

In Western's Riverside community, water is supplied from Northern California through the State Water Project via the Metropolitan Water District of Southern California's Henry J. Mills Water Treatment Plant. The Rainbow community receives Colorado River water via Metropolitan Water District of Southern California's Robert F. Skinner Water Treatment Plant.

GROUNDWATER

Groundwater production wells delivered a portion of the water supply in Murrieta. This groundwater, which has been a source of drinking water for decades, comes from a groundwater basin that lies beneath Murrieta. Imported Colorado River water and State Water Project water were also provided in our Murrieta area via the Metropolitan Water District of Southern California's Robert F. Skinner Water Treatment Plant. Groundwater from the Bunker Hill Basin was purchased from the city of Riverside for the Riverside Service Area.

Board of Directors

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S.R. "Al" Lopez
Division 5

Our Service Areas

Riverside Service Area

The communities of Orangecrest, Mission Grove, El Sobrante, Eagle Valley, Temescal Canyon, Woodcrest, Lake Mathews and March Air Reserve Base.

Murrieta Service Area

A 6.5 mile portion of the city of Murrieta located west of the I-15 freeway including historic downtown Murrieta.

Rainbow Service Area

A small area of unincorporated Riverside County south of the city of Temecula.

WATER QUALITY TABLE for CALENDAR YEAR 2009

REGULATED AT THE WATER SOURCE

Primary Drinking Water Standards Mandatory Health Related Standards	Units of Measure	State/Fed MCL [MRDL]	PHG (MCLG) [MRDLG]	Riverside (a)		Murrieta (a)		Rainbow (a)		Primary Sources
Inorganic Chemicals				Average	Range	Average	Range	Average	Range	
Aluminum	ppb	1000	600	96	ND – 160	ND	ND	ND	ND	Residue from water treatment process; erosion of natural deposits
Arsenic	ppb	10	0.004	2.5	ND – 3.4	ND	ND – 3.0	ND	ND	Erosion of natural deposits
Barium	ppb	1000	2000	ND	ND	112	ND – 250	ND	ND – 110	Discharge of oil drilling waste; erosion of natural deposits
Chromium (Total)	ppb	50	100	ND	ND	ND	ND	ND	ND	Discharge from steel/pulp mills; erosion of natural deposits
Fluoride	ppm	2	1	0.7	0.5 – 0.9	0.6	0.3 – 1.1	0.9	0.6 – 0.9	Erosion of natural deposits
Nitrate (NO_3^-) (b)	ppm	45	45	1.1	ND – 6.8	ND	ND – 0.4	ND	ND – 0.4	Industrial waste discharge, agricultural practice, leaking septic tank
Perchlorate	ppb	6	6	ND	ND	ND	ND	ND	ND	Industrial waste discharge
Radiological										
Gross Alpha	pCi/L	15	(0)	ND	ND – 5.5	3.6	3.3 – 4.3	3.6	3.3 – 4.3	Erosion of natural deposits
Gross Beta	pCi/L	50	(0)	ND	ND – 7.5	ND	ND – 8.8	ND	ND – 8.8	Erosion of natural deposits
Uranium	pCi/L	20	0.43	3.0	1.5 – 21	2.5	2.3 – 2.7	2.5	2.3 – 2.7	Erosion of natural deposits
Secondary Standards - Aesthetic Standards Inorganic Chemicals										
Chloride	ppm	500	N/A	80	31 – 99	101	93 – 120	97	93 – 100	Runoff/leaching from natural deposits
Hardness	ppm	NS	N/A	130	87 – 232	242	160 – 300	270	190 – 300	Erosion of natural deposits
Manganese	ppb	50	NL = 500	ND	ND	ND	ND – 25	ND	ND	Leaching from natural deposits
MBAS (Foaming Agents)	ppb	0.5	N/A	ND	ND	ND	ND – 0.07	ND	ND	Municipal and industrial waste discharge
Sodium	ppm	NS	N/A	70	40 – 83	92	78 – 100	93	78 – 100	Erosion of natural deposits
Sulfate	ppm	500	N/A	68	32 – 78	168	49 – 250	220	130 – 250	Runoff/leaching from natural deposits
Total Dissolved Solids (TDS)	ppm	1000	N/A	335	250 – 458	544	410 – 640	580	440 – 640	Runoff/leaching from natural deposits
Physical Properties										
Color	Units	15	N/A	ND	ND – 3	ND	ND – 5	ND	ND	Naturally-occurring organic material
Specific Conductance	µS/cm	1600	N/A	593	460 – 670	916	760 – 1100	960	760 – 1100	Substance that forms ions when in water
Turbidity (c)	NTU	TT/5	N/A	ND	ND - 0.46	ND	ND – 0.23	ND	ND	Soil runoff
Other Parameters Tested										
Alkalinity	ppm	NS	N/A	91	69 – 180	132	94 – 190	110	94 – 120	Dissolved as water passes through limestone deposits
Calcium	ppm	NS	N/A	30	17 – 73	62	44 – 74	65	44 – 74	Dissolved as water passes through limestone deposits
Chlorate	ppb	N/A	NL = 800	54	ND – 79	34	ND – 79	34	ND – 79	By-product of drinking water chlorination; industrial processes
Magnesium	ppm	NS	N/A	12	9 -15	21	9 – 29	26	20 – 29	Naturally-occurring
N-Nitrosodimethylamine (NDMA)	ppt	NS	NL = 10	4	ND – 10	ND	ND – 4	ND	ND – 4	Industrial processes, by-product of naturally-occurring drinking water chloramination
Potassium	ppm	NS	N/A	2.9	2.4 – 4	3.7	1.4 – 5	4.7	4.2 – 5	Naturally-occurring
Unregulated Chemicals Requiring Monitoring										
Boron	ppb	NS	NL = 1000	148	100 – 180	140	130 – 140	140	130 – 140	Runoff/leaching from natural deposits; industrial wastes
Chromium VI	ppb	NS	N/A	0.5	0.05 – 2.3	0.16	0.08 – 0.23	0.16	0.08 – 0.23	Industrial waste discharge
Vanadium	ppb	NS	NL = 50	6.4	5.7 – 7	ND	ND	ND	ND	Erosion of natural deposits

REGULATED IN THE DISTRIBUTION SYSTEM

Disinfection By-products				Riverside (a)		Murrieta (a)		Rainbow (a)		
Total Trihalomethanes (TTHMs)	ppb	80 (d)	N/A	24	7.1 – 36	44	25 – 63	42	28 – 51	By-product of drinking water disinfection
Haloacetic Acids (HAA5)	ppb	60 (d)	N/A	15	ND – 19	22	ND – 31	19	15 – 19	By-product of drinking water disinfection
Bromate	ppb	10 (d)	0.1	8	3.9 – 12	N/A	N/A	N/A	N/A	By-product of drinking water ozonation
Microbiological										
Total Coliform	%	5.0	(0)	0	No Range	0.5	No Range	0	No Range	Naturally present in the environment
Disinfectant										
Chloramines	ppm	[4]	[4]	1.7	0.4 – 2.5	1.8	0.4 – 3.8	2.1	1.8 – 2.7	Drinking water disinfectant added for treatment
Organic Chemicals										
Dibromochloropropane	ppt	200	1.7	ND	ND – 20	ND	ND	ND	ND	Banned hematocide that may still be present in soils

Abbreviations

MCL	Maximum Contaminant Level	**PHG**	Public Health Goal
MRDL	Maximum Residual Disinfectant Level	**ppm**	parts per million
MRDLG	Maximum Residual Disinfectant Level Goal	**ppb**	parts per billion
N/A	Not Available	**ppt**	parts per trillion
ND	Not Detected	**pCi/L**	picoCuries per Liter
NL	Notification Level	**TON**	Threshold Odor Number
NS	No MCL Standard	**TT**	Treatment Technique
NT	Testing Not Performed	**Units**	A measure of the relative color or odor in the water
NTU	Nephelometric Turbidity Units; a measure of the suspended material in water	**µS/cm**	microSiemens per centimeter
		<	Less than
		[ ]	Brackets refer to MRDL or MRDLG

Footnotes

(a) Groundwater from the Bunker Hill Basin was purchased from the City of Riverside to supplement the imported water source from the Metropolitan Water District Mills Treatment Plant. The presented data for Murrieta reflects the characteristics of groundwater distributed to the service area. Water was also imported from Metropolitan Water District's Skinner Treatment Plant to supplement groundwater. The information for the Rainbow system, except as noted, reflects the quality of water obtained from Eastern Municipal Water District.

(b) Nitrate levels in California are measured as NO_3^-, and the MCL is 45 ppm. The EPA regulates nitrates as N^-, and the MCL is 10 ppm. Both measurements represent the same nitrate concentration.

(c) Turbidity is a measure of the cloudiness of the water. High turbidity can hinder the effectiveness of disinfectants. We monitor it because it is a good indicator of water quality and the effectiveness of filtration systems, where used.

(d) Compliance to the MCL is based on running annual average only, not range parameters.

Hotline

Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants doesn't necessarily indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the U.S. Environmental Protection Agency Safe Drinking Water Hotline at **800.426.4791**.

WATER USE IT WISELY®

Special Health Information

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons, such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants, can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. U.S. Environmental Protection Agency/Centers for Disease Control (CDC) guidelines on appropriate means to lessen the risk of infection by *cryptosporidium* and other microbial contaminants are available from the U.S. Environmental Protection Agency Safe Drinking Water Hotline at 800.426.4791. *Cryptosporidium* is a microbial pathogen found in surface water throughout the U.S.

Although filtration removes *cryptosporidium*, the most commonly used filtration methods cannot guarantee 100 percent removal. Ingestion of *cryptosporidium* may cause cryptosporidiosis, an abdominal infection. Symptoms of infection include nausea, diarrhea and abdominal cramps. Most healthy individuals can overcome the disease within a few weeks. However, immuno-compromised people are at greater risk of developing life-threatening illness. We encourage immuno-compromised individuals to consult their doctor regarding appropriate precautions to take to avoid infection. *Cryptosporidium* must be ingested to cause disease, and it may spread through means other than drinking water. Our water quality monitoring indicates no *cryptosporidium* organisms in the Mills, as well as Skinner, source and finished water.

Nitrate in drinking water at levels above 45 mg/L is a health risk for infants of less than six months of age. Such nitrate levels in drinking water can interfere with the capacity of the infant's blood to carry oxygen, resulting in a serious illness; symptoms include shortness of breath and blueness of skin. Nitrate levels above 45 mg/L may also affect the ability of the blood to carry oxygen in other individuals, such as pregnant women and those with certain specific enzyme deficiencies. If you are caring for an infant or you are pregnant, you should ask advice from your health care provider. Water in all Western service areas is well below the 45 mg/L level.

Westerns's Water Testing

Drinking water in Western's service area comes from Northern California via the State Water Project, the Colorado River and local groundwater.

The imported water reaches Riverside County and is treated at either Metropolitan Water District's Mills Treatment Plant or its Skinner Treatment Plant. The water is filtered to remove any particulates and then disinfected to remove any harmful microorganisms by ozone – a highly energetic form of oxygen. Treated – or finished – water, including the groundwater, is then dosed with a combination of chlorine and ammonia, which forms chloramines, to maintain a residual disinfectant level keeping the water pathogen free.

After it's treated, the water enters a distribution system stretching over 70-square miles. Western Operations staff conducts daily, weekly and annual sampling of the water.

Water samples are tested in the field to determine pH (a measure of acidity/alkalinity) and residual disinfectant. Samples are also delivered to a California State Certified Laboratory, E.S. Babcock & Sons Laboratories, Inc., for further microbiological testing, as well as organic and inorganic chemical testing.

The lab uses analytical devices as simple as pH meters or as complex as gas chromatographs and mass spectrometers. The results are delivered to the California Department of Public Health on a monthly, quarterly and annual basis ensuring that only the highest quality drinking water is provided to our customer.

Special Exceptions

Kidney Dialysis/Aquariums

Customers who have unique water quality needs and who use specialized home treatments, such as kidney dialysis machines, should make the necessary adjustments to remove chloramines. Like chlorine, chloramines are toxic to dialysis water. Customers who have fish tanks in their homes or businesses should also take precautions to remove chloramines prior to adding water to tanks. Effective treatments include using granular-activated carbon filters or using chemicals specifically designed to remove chloramines.

Industry Leading Water Monitoring and Treatment Process

A key step in the treatment process is disinfection. Without disinfection, water would not be safe to drink.

Western water quality staff works with the Metropolitan Water District of Southern California, the State Department of Public Health and independent certified testing laboratories to continuously monitor the quality of the water supplies. Metropolitan, the supplier of much of the water Western provides to its customers, has one of the most sophisticated water quality monitoring and treatment programs in the world. It performs continuous water monitoring and conducts several hundred water quality tests per day. Western then performs even more testing with more than 85 routine bacteriological samplings and more than 25 physical samplings taken from more than 40 different locations. These samples are compared to more than 175 state and federal standards.

Water delivered within the Riverside Service Area, which comes from the Metropolitan Water District's Mills Water Treatment Plant, has been through a complex treatment process. Metropolitan Water District uses ozone as the primary disinfectant in its Mills Treatment Plant. The water is also disinfected with chloramines. Chloramines, a combination of chlorine and ammonia, are a type of disinfectant used to prevent re-growth of potentially harmful bacteria in the water distribution system. They're approved by the Environmental Protection Agency as a disinfectant for drinking water and have been used safely for years. Chloraminated water is safe to drink because the digestive process neutralizes the chloramines before they enter the bloodstream. Chloraminated water is also safe for all other daily uses, including bathing and cooking. In addition, using chloramines as the residual disinfectant results in lower overall levels of disinfection by-products such as trihalomethanes.

Additional Riverside Service Area supply comes from groundwater similar to our Murrieta Service Area. Within the Murrieta Service Area, the water delivered to the customer's tap is chloraminated at each well site before entering the distribution system. The imported water supplied from the Metropolitan Water District's Skinner Water Treatment Plant is also chloraminated and is delivered to the Rainbow Service Area.

Source Water Assessment

A Source Water Assessment lists possible contaminants that might affect the quality of your water sources.

The assessment of the Murrieta system was completed in July 2001 and identified no known immediate threats to the groundwater. In Dec. 2002, the Metropolitan Water District completed its source water assessment of its State Water Project supply and the Colorado River source. The Colorado River source is considered to be most vulnerable to urban/storm water runoff, increasing urbanization in the watershed and wastewater. State Water Project supplies are considered to be most vulnerable to urban/storm water runoff, wildlife, agriculture, recreation and wastewater. Copies of complete assessments are available from Western Municipal Water District. Please contact the Public Affairs Office at 951.776.4519 or via email at water@wmwd.com for further assistance.

Lead and Copper Testing

The Lead and Copper Rule (LCR) was developed to protect public health by minimizing lead and copper levels in drinking water. The most common source of lead and copper in drinking water is corrosion of plumbing materials. Plumbing materials that can be made with lead and copper include pipes, solder, fixtures and faucets. The LCR established an action level of 15 ppb (parts per billion) for lead and 1.3 ppm (parts per million) for copper based on the 90th percentile level of tap water samples. This means no more than 10 percent of your samples can be above either action level. The Maximum Contaminant Level Goal (MCLG) for copper is 1.3 ppm; there is no MCLG for lead. The number of homes tested for the LCR in Riverside was 46; Murrieta, 21; and Rainbow, 8. Lead and copper are sampled on a state mandated three year testing cycle with sampling conducted at the customer's tap.

Lead and Copper Testing (Inorganic) – regulated at customer's tap

	Lead (ppb)	Copper (ppm)
Action Level @ 90th Percentile	15	1.3
MCLG	N/A *	1.3
Riverside		
90th percentile value	ND*	0.110
# over action level	0 of 46	0 of 46
Murrieta		
90th percentile value	ND*	0.320
# over action level	0 of 21	0 of 21
Rainbow		
90th percentile value	12	0.306
# over action level	1 of 8	0 of 8

If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. Western Municipal Water District is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline or at http://www.epa.gov/safewater/lead.

Forty-six homes tested in the Riverside service area; 21 tested in the Murrieta service area with the last three year testing cycle completed in August 2007. Lead and copper are sampled on a state mandated three year testing cycle. Sampling is required within the distribution system. Eight homes were tested in the Rainbow service area with the last three year testing cycle completed in June 2009.

** Please see abbreviations on page 4.*

Measurement Terms

This water quality table provides data on the levels of constituents detected and how these compare to state standards. If you have questions, suggestions or comments about the information contained in this 2010 Water Quality Report, or for additional copies, please contact Matt Buck at 951.789.5085 or via email at mbuck@wmwd.com.

Maximum Contaminant Level (MCL): The highest level of a contaminant that is allowed in drinking water. Primary MCLs are set as close to the PHGs (or MCLGs) as is economically and technologically feasible. Secondary MCLs are set to protect the odor, taste and appearance of drinking water.

Maximum Contaminant Level Goal (MCLG): The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs are set by the U.S. Environmental Protection Agency.

Maximum Residual Disinfectant Level (MRDL): The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.

Maximum Residual Disinfectant Level Goal (MRDLG): The level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.

Notification Level (NL): The level at which notification of the public water system's governing body is required. Prior to 2005, NL was known as the Action Level (AL).

Primary Drinking Water Standards (PDWS): MCLs and MRDLs for contaminants that affect health along with their monitoring and reporting requirements, and water treatment requirements.

Public Health Goal (PHG): The level of a contaminant in drinking water below which there is no known or expected health risk. PHGs are set by the California Environmental Protection Agency.

Regulatory Action Level (AL): The concentration of a contaminant, which, if exceeded, triggers treatment or other requirements that a water system must follow.

Treatment Technique (TT): A required process intended to reduce the level of a contaminant in drinking water.

APPENDIX D – MONITORING PROTOCOLS

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Riverside and Arlington Basins
Groundwater Monitoring Protocols

TABLE OF CONTENTS

TABLE OF CONTENTS ..... **II**

TABLE OF FIGURES ..... **III**

TABLE OF TABLES ..... **IV**

ACRONYMS AND ABBREVIATIONS ..... **V**

SECTION 1 INTRODUCTION **1**

SECTION 2 GROUNDWATER LEVELS AND QUALITY **3**

LOCATIONS 3

Water Levels 3

Water Quality 8

FREQUENCY 11

METHODS 11

Groundwater Levels 11

Groundwater Quality 12

Shipping 14

Analytical Methods 14

Laboratory Quality Control 14

SECTION 3 SURFACE WATER FLOW AND QUALITY **15**

SECTION 4 GROUNDWATER PRODUCTION **17**

SECTION 5 LAND SUBSIDENCE **18**

SECTION 6 REFERENCES **19**

TABLE OF FIGURES

Figure D-1a Wells Monitored for Groundwater Levels, Arlington Basin

Figure D-1b Wells Monitored for Groundwater Levels, Riverside Basin

Figure D-2a Wells Monitored for Groundwater Quality, Arlington Basin

Figure D-2b Wells Monitored for Groundwater Quality, Riverside Basin

TABLE OF TABLES

Table D-1a Wells Monitored for Water Levels, Arlington Basin

Table D-1b Wells Monitored for Water Levels, Riverside Basin

Table D-2a Wells Monitored for Water Quality, Arlington Basin

Table D-2b Wells Monitored for Water Quality, Riverside Basin

Table D-3 Location and Data Availability of Selected USGS Stream Gages

ACRONYMS AND ABBREVIATIONS

1969 Western Judgment	Judgment in *Western Municipal Water District of Riverside County et al., vs. East San Bernardino County Water District* et al.
Basin Plan	Water Quality Control Plan for the Santa Ana Basin
DPH	California Department of Public Health
GWMP	Groundwater Management Plan
TDS	total dissolved solids
Watermaster	Western-San Bernardino Watermaster

SECTION 1 INTRODUCTION

These Monitoring Protocols are developed as part of the Riverside Basin Groundwater Management Plan (Riverside GWMP) and the Arlington Basin Groundwater Management Plan (Arlington GWMP). The Monitoring Protocols cover both basins. With the exception of regulatory or court ordered monitoring, monitoring is performed by individual agencies on a voluntary basis, with additional monitoring activities by Western's Cooperative Well Measurement Program.

It is important that monitoring protocols and frequencies be adhered to over the long-term. As such, the protocols and frequencies are defined to be realistic for agencies that have limited funds and personnel for monitoring activities. Should an agency feel that the monitoring is an undue burden, they should request revision to the requirements in the Plan so that the most critical monitoring can be identified for continuation, while less critical monitoring can be ceased or curtailed.

These Monitoring Protocols are intended to meet the current and future needs for:

- Compliance with the Groundwater Management Plan (GWMP) Basin Management Objectives, including:
    - Groundwater levels
    - Groundwater quality
    - Land subsidence
- Trend analysis of groundwater level and groundwater quality
- Analysis of flow direction
- Future estimates of change in storage and other groundwater budget components
- Groundwater projects that will required baseline water level and water quality data for planning and operational monitoring
- Groundwater modeling efforts, which rely heavily on historical data
- Compliance with groundwater requirements of the 1969 Western Judgment (*Western Municipal Water District of Riverside County v. East San Bernardino County Water District*, Superior Court No. 78426)
- Compliance with anticipated requirements of the California Statewide Groundwater Elevation Monitoring (CASGEM) Program, authorized by SBx7 6, enacted in November 2009.

CASGEM is a particularly urgent part of these monitoring protocols as deadlines occured as soon as January 1, 2011. CASGEM is a statewide program to measure groundwater elevations in California's basins and subbasins. It establishes collaboration between local monitoring entities and DWR where the local entities collect water level data and submits the data to DWR's database. If no local entity volunteers to provide such assistance and become a Monitoring Entity, DWR assumes the monitoring role in the basin and certain entities in the

basin may be ineligible for water grants or loans. Therefore, it is critical that entities within the Riverside and Arlington Basins determine who should be the Monitoring Entity or Entities for the basins and notify DWR of this intent prior to the January 1, 2011 deadline. Potential Monitoring Entities include a combination of the Western-San Bernardino Watermaster (Watermaster), Western, Valley District, and the individual retail water purveyors. Additional details are online at http:/ / www.water.ca.gov/ groundwater/ casgem.

SECTION 2 GROUNDWATER LEVELS AND QUALITY

The location and frequency of sampling requires foresight into the data needs of the future. Today's monitoring is typically of little use until or unless there is a long period of record to analyze trends and a large dataset to analyze spatial variability. Decisions to monitor for water levels and water quality today can greatly improve the ease and accuracy of future water planning efforts.

LOCATIONS

WATER LEVELS

Wells currently being monitored for water levels are owned by water agencies or are private wells monitored by the Cooperative Well Measurement Program. Monitoring wells related to groundwater remediation projects and monitored by the Potentially Responsible Parties are also significant sources of data.

Wells monitored for compliance with the 1969 Western Judgment are:

- 1S 4W 21 Q3 (Johnson 1)
- 1S 4W 29 H1 (Flume 2)
- 1S 4W 29 Q1 (Flume 5)

Note that Johnson 1 is located outside of the Riverside and Arlington Basins, in the Rialto-Colton Basin. These three wells are monitored in the fall for compliance with the 822.04 feet above sea level 1963 average water level.

A list of wells recently monitored for groundwater levels is provided in Tables D-1a and D-1b and shown on Figures D-1a and D-1b, based on 2003-2007 AWQ water level data. Figures D-1a and D-1b also show wells equipped with pressure transducers. These wells should continue to be monitored and any other relevant wells should be added to the monitoring program, with a focus on dedicated monitoring wells with records of well construction and lithology.

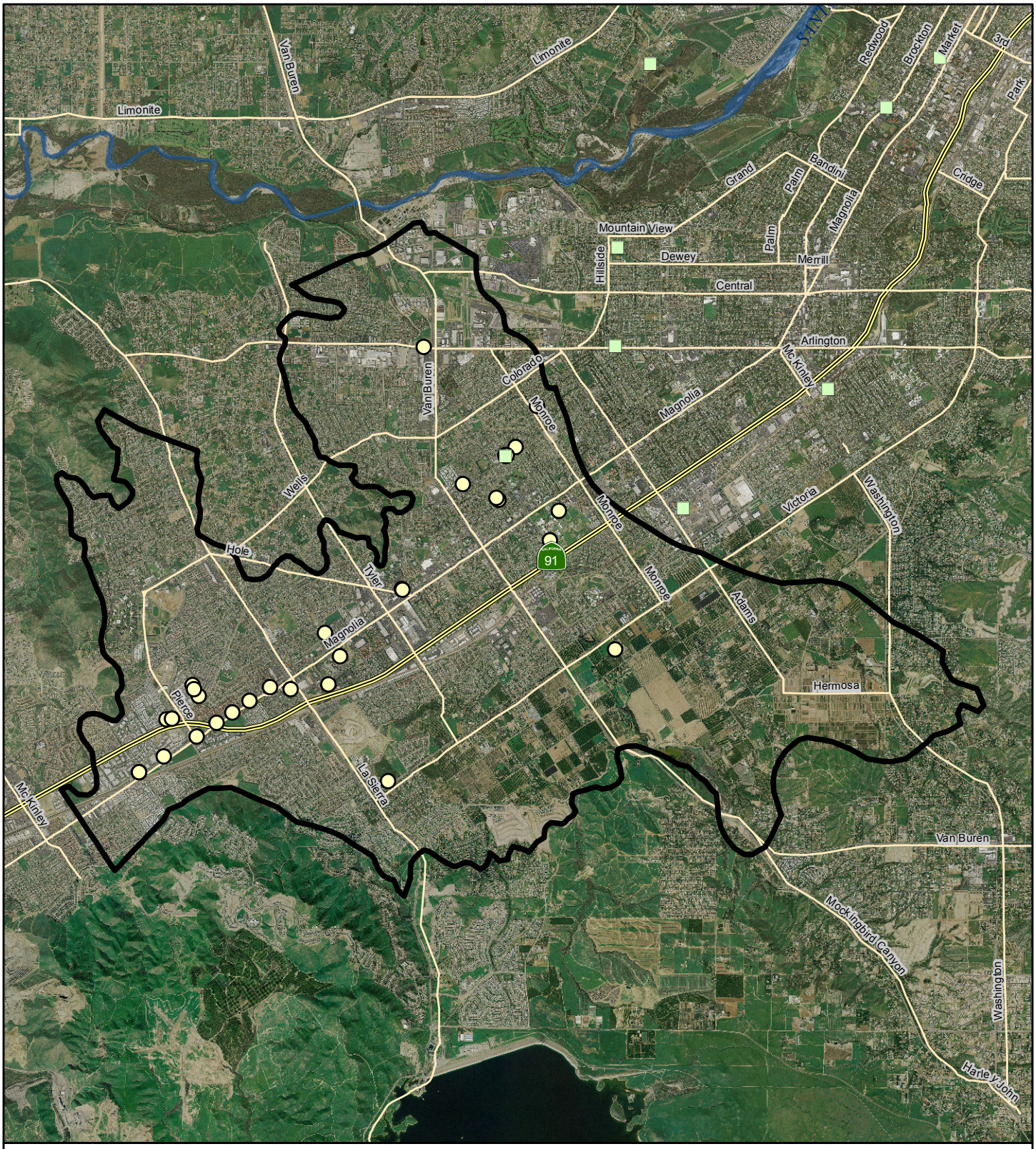
Table D-1a Wells Monitored for Water Levels, Arlington Basin

Abraham	Cal Baptist	La Sierra 6
AD-1	Daly 2	Loving Homes
AD-2	Doi	Mobil #18 D8H (#89208)
AD-3	Garfield	Pierce St Sewer 2
AD-4	Hole 1	Pierce St Sewer 3
AD-5	Hole 2	Polk*
Arlington Mutual	Iselin 1	Sherman High
Army 1	Iselin 2	Sherman Tower
Army 3	Jackson	Twin Buttes 1
Buchanan 1	La Sierra 4	Unocal (#89213)
Buchanan 2	La Sierra 5	Walton

*Polk Well has been destroyed.
Monitoring has recently begun at the Flat Rock Well.

Table D-1b Wells Monitored for Water Levels, Riverside Basin

1	Fill	Rialto CRMW-3
8	First Street	Rialto CRMW-4
#12, Airport	Flume 2	Rialto CRMW-5
#13 Hunter 6	Flume 3	Rialto CRMW-6
#14, 46th St	Flume 4	RN 16
#2, Troyer	Flume 5	RN 17
#4, Skotty	Flume 6	RN 20
#5 New 36st	Freeway Well	RN 21
#7 36&Daley	Garner	RN 22
28thSt.,#3	Garner B	RN 6
8th St	Garner C	RN 7
Arco #1941 (#94603)	Garner D	Roos
Arco #5168 (#931015)	Highgrove 1	Roos #2 S'ly
Belltown BMW-1	Highgrove 3	Russell C Well
Belltown BMW-2	Jurupa 6	SAR@RRxing
Belltown BMW-3	Jurupa 7	SIX (6)
Belltown BMW-4	Jurupa Water Co. #3	Sunnyslope #3
Brunton	La Loma	Sunnyslope #5
C-122	Laura Lane	Tequesquite CW-2A
C-124	Lincoln Heights	Tequesquite M3D
Cal Electric #3	LV 3	Tequesquite M4D
Cal Electric #4	Main Pellisier Ran	Tequesquite W-16
CL-01	Mobil #18-182 (#89330)	Tequesquite W-24
CL-05	Moore-Griffith	Tequesquite W-4A
CL-06	Mori No. 2	Twin Buttes 6
Clear Water	Mori Well	Twin Springs
Co.Parks HQ	Mulberry	Van Buren 1
CPC East Side	NO 1	Van Buren 2
Cunningham 2	No. 5 Well	West Riverside
Deberry	Olivewood 1	West Riverside RG-2
Double D Ranch	Olivewood 2	West Riverside RG-3
E	Olivewood 3	West Riverside RG-4
Edmunds "D"	Orange Acres	West Riverside RG-5
Electric Street	Palmyrita 2	West Riverside RG-6
Eleventh Strt Well	Park HQ 1	WVWD 18A
EVMWD Palm	Park HQ 2	WVWD 29
Fairmont 1	Pico #64	WVWD 41
Fairmount 2	Rialto CRMW-1	
Fast Gas (#92371) Gemco	Rialto CRMW-2	



Legend

- Groundwater Level Monitoring Wells*
- Transducer Wells
- Plan Area
- Highway
- Roads

* Groundwater Level Monitoring Wells are a subset of wells in the Cooperative Well Measuring Program that have groundwater measurment records from 2003 to 2007, locations derived from AWQ Database

N
W E
S

0 0.5 1 2 Miles

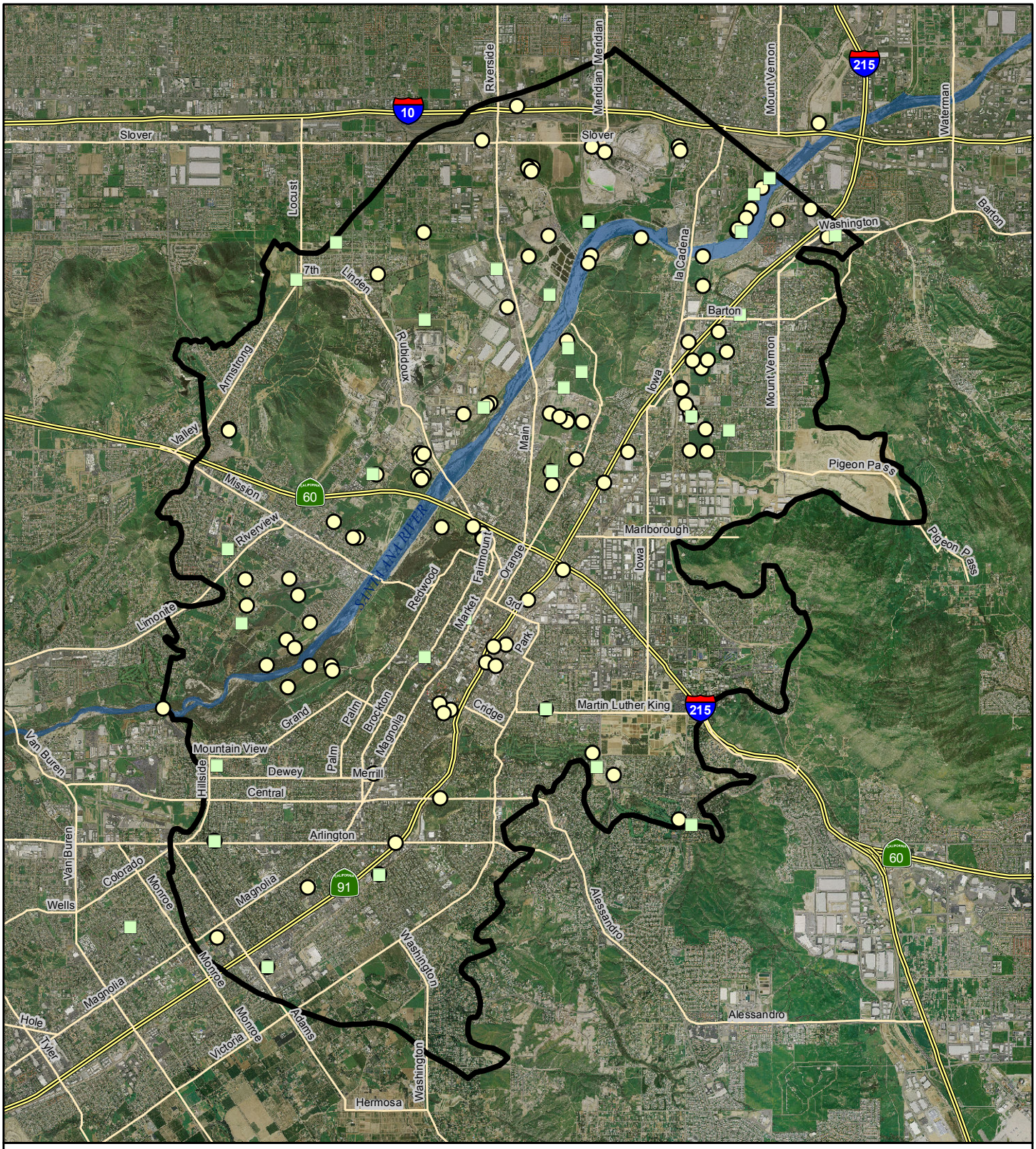
WESTERN MUNICIPAL WATER DISTRICT

Wells Monitored for Groundwater Levels

Arlington and Riverside Basin Groundwater Management Plans

2010

Figure D-1a



Legend

- Transducer Wells
- Groundwater Level Monitoring Wells*
- Plan Area
- Highways
- Roads

* Groundwater Level Monitoring Wells are a subset of wells in the Cooperative Well Measuring Program that have groundwater measurment records from 2003 to 2007, locations derived from AWQ Database

N W E S

0 0.5 1 2 Miles

CITY OF RIVERSIDE

Wells Monitored for Groundwater Levels

Arlington and Riverside Basin Groundwater Management Plans

2010

Figure D-1b

WATER QUALITY

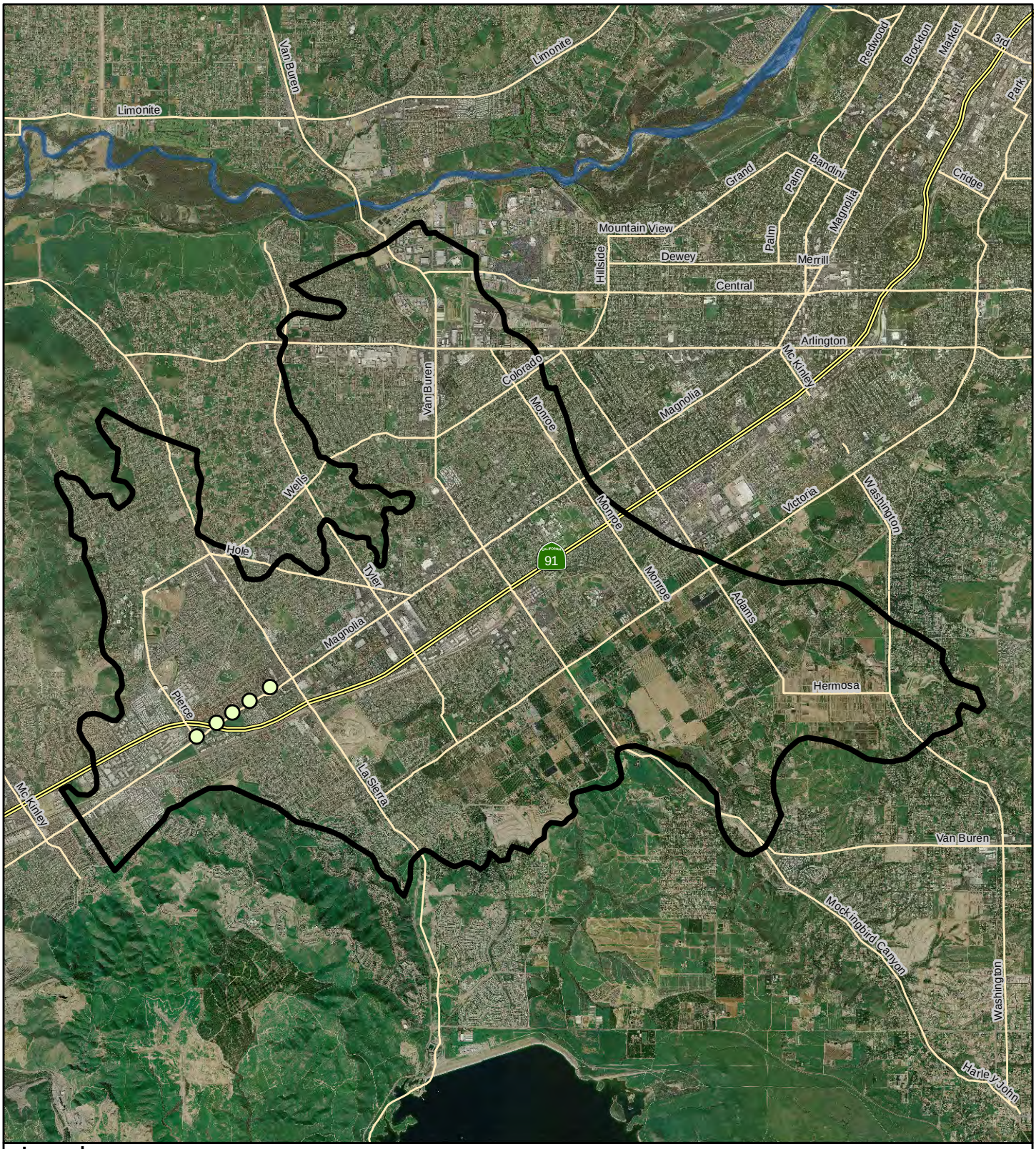
Water quality should be sampled as needed to meet Title 22 requirements, with additional nitrate and total dissolved solids (TDS) sampling to improve analysis needed for compliance and definition of Basin Plan Objectives and to plan for future recharge and desalter projects. A list of wells recently monitored for nitrate or TDS, with well owner, is provided in Tables D-2a and D-2b and shown on Figures D-2a and D-2b. These wells should continue to be monitored and any other relevant wells should be added to the monitoring program.

Table D-2a Wells Monitored for Water Quality, Arlington Basin

AD-1
AD-2
AD-3
AD-4
AD-5

Table D-2b Wells Monitored for Water Quality, Riverside Basin

8th St	Flume 6	RN 17
Agua Mansa	Garner B	RN 20
Center Street Well	Garner C	RN 21
CL-01	Garner D	RN 22
Cunningham 2	Jurupa 7	RN 6
DeBerry	LV 3	RN 7
Electric Street	Moore-Griffith	Russell C Well
Eleventh Street Well	Mulberry	SAR@RRxing
EVMWD Palm	OBO1	Twin Springs
Fill	OBO2	Van Buren 1
First Street	Olivewood 1	Van Buren 2
Flume 2	Palmyrita 1	WVWD 18a
Flume 3	Palmyrita 2	WVWD 41
Flume 4	RIX Site	



Legend

- Groundwater Quality Monitoring Wells*
- Plan Area
- Highway
- Roads

* Groundwater Quality Monitoring Wells are derived from the AWQ Database and have records from 2003 to 2007

N W E S

0 0.5 1 2 Miles

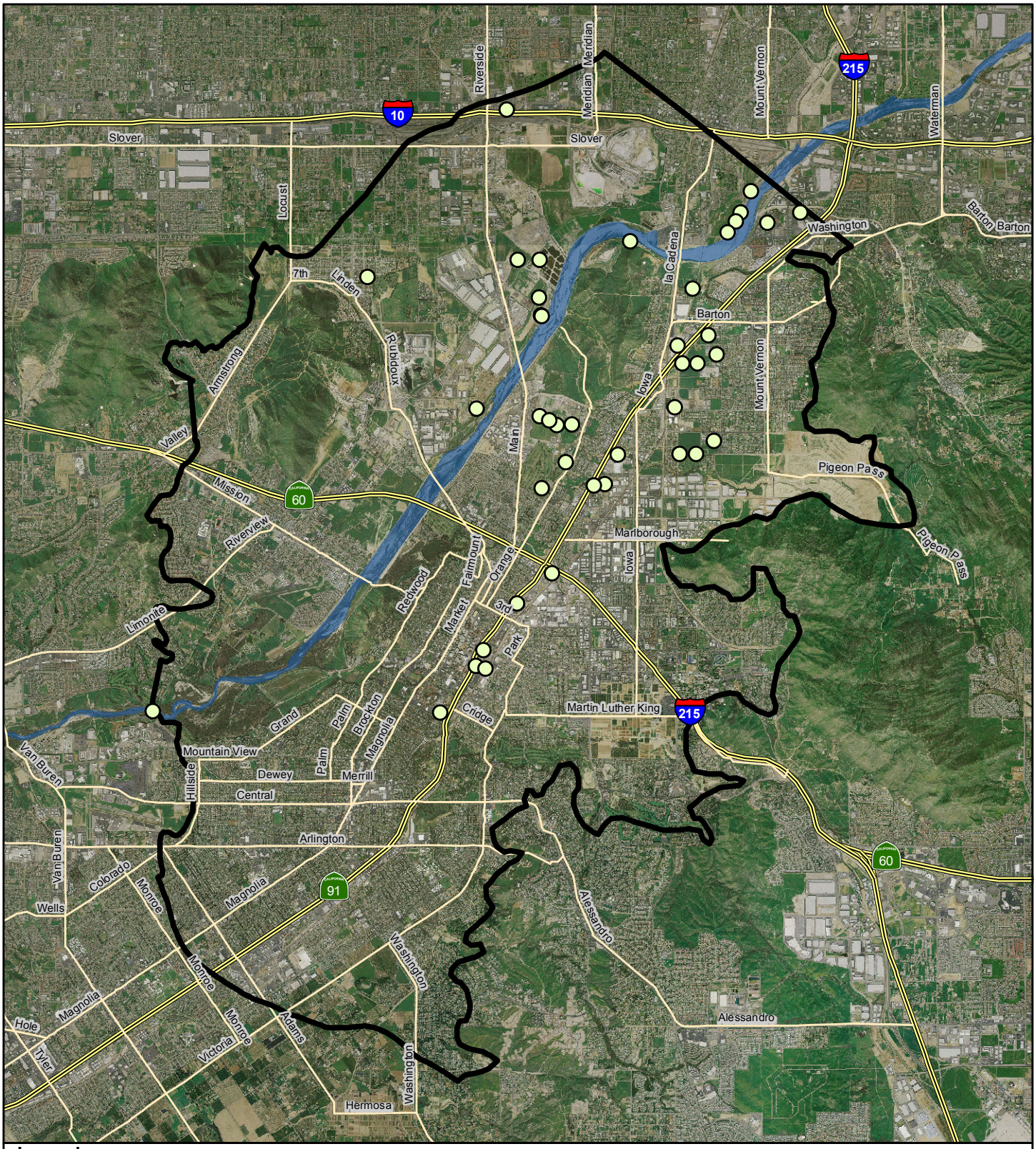
WESTERN MUNICIPAL WATER DISTRICT

Wells Monitored for Groundwater Quality

Arlington and Riverside Basin Groundwater Management Plans

2010

Figure D-2a



Legend

- Groundwater Quality Monitoring Wells*
- Plan Area
- Highways
- Roads

* Groundwater Quality Monitoring Wells are derived from the AWQ Database and have records from 2003 to 2007

N W E S

0 0.5 1 2 Miles

CITY OF RIVERSIDE

Wells Monitored for Groundwater Quality

Arlington and Riverside Basin Groundwater Management Plans

2010

Figure D-2b

There are notable deficiencies in TDS and nitrate sampling in the Riverside-D (as defined in the Basin Plan) Management Zone (see Figure 1-7 in the Arlington GWMP or Figure 1-8 of the Riverside GWMP). Additional TDS and nitrate sampling may be beneficial in this area. Additional wells in Riverside-D should be considered for TDS and nitrate sampling. Excluding gas station contaminant monitoring wells that are typically shallow, these wells include:

- Private Wells
  - Laura Lane
- City of Riverside Wells
  - Lincoln Heights
  - Orange Acres

FREQUENCY

It is desired that all available wells be monitored monthly for water levels within the basin. Minimally, water levels should be measured semi-annually, within a month of April 15 and within a month of November 15 of each year. These dates are selected to be seasonally high groundwater levels after the rainy season (April 15 measurement) and seasonally low groundwater levels after the dry season (November 15 measurement). Benefits of monthly measurements over semi-annual measurements is better definition of seasonal highs and lows, as well as better identification of measurement or transcription errors by comparing to the previous and following measurements. Monthly measurements are also useful for detailed analysis, including development and refinement of groundwater models.

METHODS

Details on monitoring methods are available in the USGS National Field Manual at http:/ / pubs.water.usgs.gov/ twri9A4/ . A summary of requirements for methods are provided below for both water levels and water quality.

GROUNDWATER LEVELS

Groundwater levels are intended to represent static water level conditions. The procedure for measuring groundwater levels will be as follows:

- Measured wells should have basic information on file, including:
  - Location, with projection information and source (surveyed, GPS, or other method)
  - Elevation of reference point for measurement and ground surface, with datum information and source (surveyed or GPS)
  - Depth from reference point to screen interval
  - Depth from reference point to the bottom of the well
  - Lithology and well construction information
- Measurements should be made by trained, knowledgeable personnel.

- Field forms should have information on previous measurements for context when measuring.
- Turn off well, if applicable, for a period of at least 24 hours. The period required for recovery should be tested through a one-time test with hourly or transducer readings.
- If the well cap is tight and unvented, ensure that water levels are at equilibrium by checking water levels multiple times.
- Measure from the defined reference point to groundwater using an electric water level sounder, steel tape, or a datalogging pressure transducer, to the nearest 0.01 foot. Measure twice to ensure accuracy.
- Clean tapes after use at every well to prevent contamination.
- If using a pressure transducer, data must be corrected for atmospheric pressure if not automatically performed by the device.
- Transducer data must be confirmed with regular hand measurements.
- Record data on a field form, which should include the following information
    - Name of person performing monitoring
    - Date and time
    - Well name
    - Date and time pump was turned off, if applicable
    - Depth to groundwater
    - Equipment used (e.g., sounder, steel tape, portable air line etc.) including specific unit, if applicable
    - Notes, such as odors, wellhead problems, etc.

GROUNDWATER QUALITY

Sampled wells should have basic information on file, including:

- Location, with projection information and source (surveyor or GPS)
- Elevation of reference point for measurement and ground surface, with datum information and source (surveyor or GPS)
- Depth from reference point to screen interval
- Depth from reference point to the bottom of the well
- Lithology and well construction information

Water Level

The water level shall be measured in the well prior to purging or sampling. Clean tapes after use at every well to prevent contamination. See the previous section for methods.

Purging

Sampling shall be performed following purging of the well casing. Low-flow or no-purge techniques may be used, but method must be noted on the sampling results and protocols must be added to this document for consistency across agencies that may want to adopt the same technology.

Purging is important to ensure that the sample represents water quality in the formation surrounding the well, rather than water quality within the well casing, which may not be

representative due to materials used in the well construction process or due to differences in environmental conditions, such as oxidation-reduction potential, between the water in the well casing and water in the formation. Purging attempts to remove all standing water in the well casing and replace it with water from the formation. Field monitoring can be performed to establish stabilization of certain parameters, such as pH, temperature, turbidity, and dissolved oxygen, but for simplicity at least 4 casing volumes of water will be purged prior to sampling. The volume of water is intended to remove water in the filter pack in the borehole in addition to the water in the casing itself. The casing volume can be calculated by the following formula:

$$V = 0.0408 d^2 * (t - w)$$

Where:

V = volume of water in the casing
d = well diameter [in]
w = depth to water [ft]
t = total depth [ft]
0.0408 = constant that converts units to gallons, and diameter into radius, and incorporates pi.

Purging can be performed using a pump or bailer.

Sampling

After purging, collect the sample using methodology appropriate for the sampler (e.g., pumping, bailing, diffusion bag). Clean all equipment as appropriate.

Field QA/QC Samples

Given the nature of the ambient monitoring needed for the GWMP, these samples may not be necessary unless required by regulatory or court guidelines.

Sampling agencies may adopt Field QA/ QC samples if desired. These samples can include field duplicates, trip blanks, field blanks, and rinsate samples. Field duplicates can be used to estimate the precision associated with sampling procedures. Trip blanks, field blanks, and rinsate samples can help monitor potential contamination from shipment, field conditions, and decontamination procedures, respectively.

Records

Field records include usage of a field notebook and Chain-of-Custody as well as labels for the samples. All items should be completed in blue or black indelible ink. The field notebook should include:

- Name of person performing monitoring
- Well name
- Date and time of sample
- Water level prior to sampling

- Depth to bottom of well
- Calculated volume of water in the casing
- Purge method
- Volume purged
- Analysis required for each sample
- Equipment used (e.g., type of pump and specific unit, if applicable)
- Notes, such as odors, wellhead problems, etc.

The Chain-of-Custody and labels should include:

- Name of person performing monitoring
- Agency name
- Well name
- Date and time of sample
- Analysis required for each sample
- Preservatives in the sample bottle, if any

SHIPPING

Samples requiring shipment to a laboratory will be packaged to avoid damage to the containers and cooled with ice to 4 degrees Celsius if required for the analytical method(s). As the nitrate analysis has a 24 hour holding time, samples will be delivered to the laboratory immediately either by courier or hand-delivered

ANALYTICAL METHODS

Most water quality sampling will be performed for Title 22 compliance and will use the analytical methods prescribed by the Department of Public Health (DPH).

Additional analytes may be added if there are nearby contaminant sources that require analysis for specific contaminants.

LABORATORY QUALITY CONTROL

The laboratory selected for analysis will be certified by DPH and will adhere to

- 21 CFR Part 58, *Good Laboratory Practices*
- Criteria in *Methods for Chemical Analysis of Water and Wastes*, 1983 (EPA-600/ 4-79-020)
- Procedures in SW-846 *Test Methods for Evaluating Solid Waste-Physical/Chemical Methods*, 3rd Edition, 1994
- Criteria in 40 CFR 136 *Guidelines Establishing Test Procedures for Analysis of Pollutants Under the Clean Water Act*

Laboratory quality control will be the standard quality control of the selected laboratory.

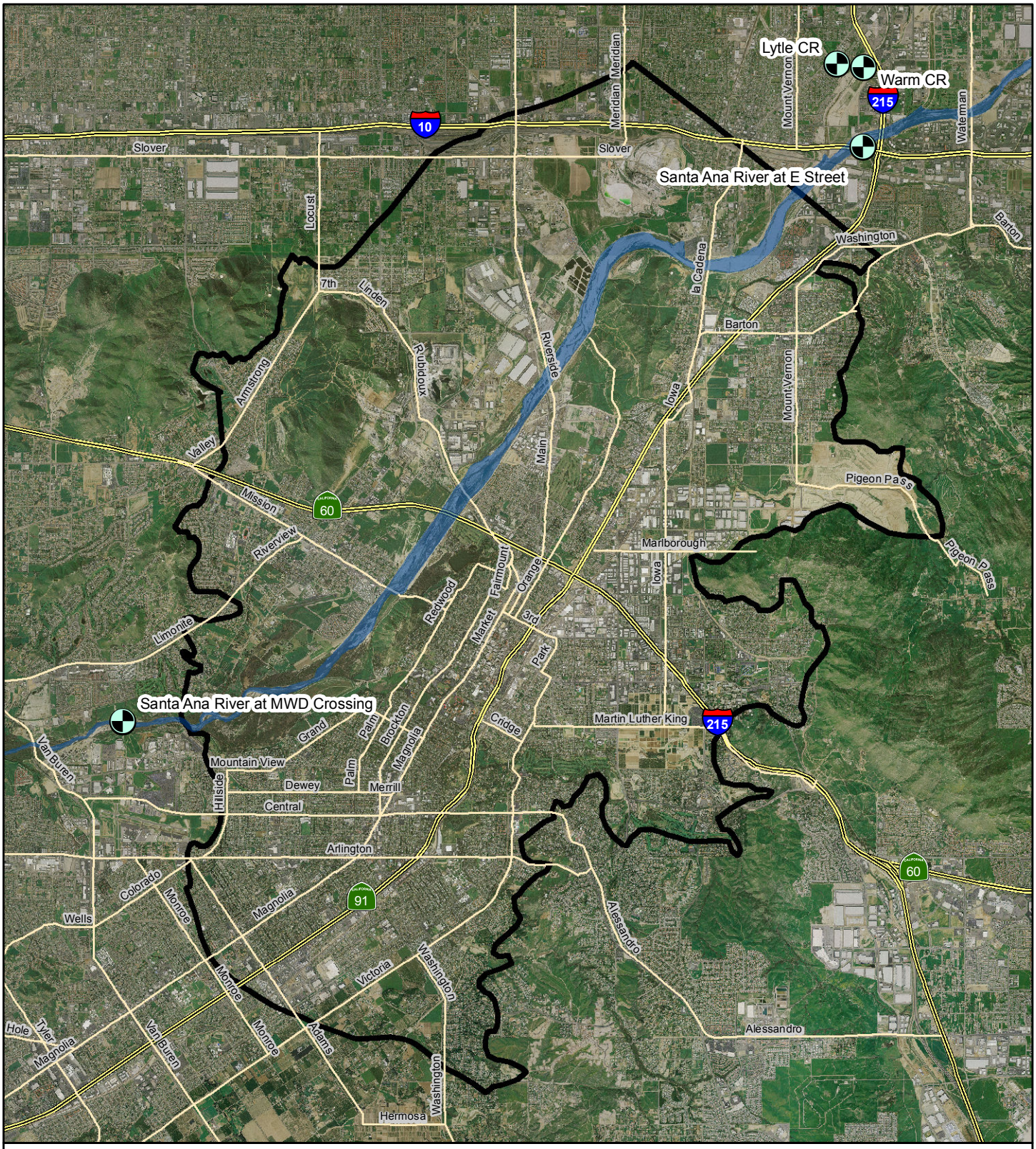
SECTION 3 SURFACE WATER FLOW AND QUALITY

While this Groundwater Management Plan focuses on groundwater, surface water is closely linked with both groundwater quality and quantity and requires monitoring to track Basin Management Objectives for the Groundwater Management Plan. The monitoring described in this section focuses on documenting existing surface water monitoring efforts and does not propose new sampling. Should these existing programs cease, efforts may be required to continue collecting the data.

The United States Geological Survey (USGS) operates four Santa Ana River stream gaging stations in and around the basin. Three of the gages are located near the intersection of Interstates 10 and 215 (to the north in the Rialto-Colton Basin) and one is located just downstream of the Riverside Narrows. Two of the three upstream gages are located on tributaries to the Santa Ana River: Lytle Creek and Warm Creek. The Santa Ana River and the four USGS stream gages are shown on Figure D-3. Table D-3 provides location and data availability of the selected USGS stream gages.

Table D-3 Location and Data Availability of Selected USGS Stream Gages

Station No.	Water Course	Location	Available Data		
			Frequency	Start Date	End Date
11059300	Santa Ana River	E Street at I-10	Daily	Mar 1939	Present
11066460	Santa Ana River	MWD Crossing at Riverside Narrows	Daily	Mar 1970	Present
11060400	Warm Creek	Near San Bernardino	Daily	Mar 1964	Present
11065000	Lytle Creek	Colton	Daily	Oct 1957	Present



Legend

- Plan Area
- Highways
- Roads
- Stream Gage

N
W E
S

0 0.5 1 2 Miles

CITY OF RIVERSIDE

Rainfall and Streamflow Stations

Arlington and Riverside Basins Groundwater Management Plans

2010

Figure D-3

SECTION 4 GROUNDWATER PRODUCTION

Groundwater production is currently monitored by the well owners and reported to the Watermaster who compiles reports on annual groundwater production for the Riverside Basin. Arlington Basin groundwater production is also included in the groundwater extraction database, although the basin does not fall under the 1969 Western Judgment.

Well owners should provide monthly data to the Watermaster for inclusion in the database. While reporting by the Watermaster will continue at the annual level, the monthly data will be available for water resources planning efforts as needed by the cooperating well owners.

SECTION 5 LAND SUBSIDENCE

Monitoring for land subsidence is under consideration for future activities. Monitoring may include land surveys, extensiometers, or Satellite Interferometric Synthetic Aperture Radar (InSAR).

United States Geological Survey. 2006. *National Field Manual for the Collection of Water-Quality Data (TWRI Book 9) Chapter A4. Collection of Water Samples (Version 2.0).* September, accessed 6/7/10 at: http://pubs.water.usgs.gov/twri9A4/.