West San Jacinto Groundwater Management Area

2020 Annual Report

Prepared by
Eastern Municipal Water District

emwd EASTERN MUNICIPAL WATER DISTRICT

May 2021

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Acknowledgments

The success of the West San Jacinto Groundwater Basin Groundwater Management Plan and its implementation efforts are the direct result of the cooperative effort between the private and public groundwater producers in the Management Plan area.

Sincere thanks are extended to all the groundwater producers who participated in the groundwater monitoring programs. Without their cooperation, the successful implementation of the Management Plan would not be possible.

The Advisory Committee members and the Hemet/San Jacinto Liaison have been generous in providing their time, expertise, and knowledge.

The Councils and Boards for the Cities of Moreno Valley and Perris, Eastern Municipal Water District, and Nuevo Water Company are recognized for their vision, leadership, and teamwork during the implementation of Management Plan.

West San Jacinto Groundwater Management Area
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1 EXECUTIVE SUMMARY

The West San Jacinto Groundwater Management Area 2020 Annual Report (Annual Report) was prepared by Eastern Municipal Water District (EMWD) in accordance with the West San Jacinto Groundwater Basin Groundwater Management Plan (EMWD, 1995 [Management Plan]). The reporting period extends from January 1, 2020 through December 31, 2020.

The West San Jacinto Groundwater Management Area (Management Area) is located in the western portion of Riverside County within the San Jacinto River Watershed and includes the cities of Moreno Valley, Menifee, and Perris, as well as the unincorporated areas of Lakeview, Nuevo, and Winchester, as presented in Chapter 7, Figure 7-1. The Management Area covers approximately 256-square miles (over 164,200 acres) and has been divided into six (6) groundwater management zones as shown in Chapter 7, Figure 7-2, encompassing water bearing sediments (aquifer materials) as well as essentially non-water bearing areas such as the Lakeview Mountains, the Bernasconi Hills and Mount Russell Range around Lake Perris, the Double Butte area near Winchester, and areas in the extreme northern and western portions of the EMWD.

1.1 Monitoring Programs Summary

EMWD oversees the Monitoring Programs within the Management Area including: groundwater quality, groundwater level, groundwater extraction, and inactive well capping and sealing programs. Other groundwater related data is also collected in support of these programs including: recycled water use, imported water use, precipitation, and additional activities affecting the entire Management Area and/or specific groundwater management zones. Participation in the Groundwater Monitoring Programs is voluntary for well owners. Detailed information about the Monitoring Programs can be found in Chapter 4.

During the 2020 Groundwater Quality Monitoring Program, water quality samples were collected from a total of 96 wells in the Management Area. Ninety-five (95) samples were analyzed for total dissolved solids (TDS). Ten (10) of the ninety-five (95) samples analyzed for TDS reported values below the secondary maximum contaminant level (MCL) of 500 milligrams per liter (mg/L). Ninety-six (96) samples were analyzed for nitrate as nitrogen (NO_3-N). Eighty (80) of the ninety-six (96) samples analyzed for nitrate as nitrogen (NO_3-N) reported values below the primary MCL of 10 mg/L for NO_3-N. The highest TDS concentration in the Management Area was 23,000 mg/L reported for well EMWD-Skiland 02, located in the Perris South groundwater management zone and the lowest was 239 mg/L reported for well Fish and Game West, located in the Lakeview groundwater management zone. The highest NO_3-N concentration measured in the Management Area was 25.1 mg/L reported for

well EMWD 46 Edgemont 02, located in the Perris North groundwater management zone and the lowest sample concentrations were “non-detects” for wells located in the Lakeview portion of the Lakeview/Hemet North, Perris North, Perris South, and San Jacinto Lower Pressure groundwater management zones.

The Groundwater Level Monitoring Program includes collecting groundwater levels in the Spring and Fall of each year. During Spring 2020, EMWD measured static depth-to-water in 138 wells in the Management Area. During the 2019-2020 calendar years, 130 wells were measured for static depth-to-water in the Spring. Twenty-two (22) of the 130 wells measured during both Spring 2019 and Spring 2020 showed a depth-to-water increase of more than five (5) feet (ft) from the previous year (Spring 2019). Two (2) of the 130 wells measured during both Spring 2019 and Spring 2020 showed a depth-to-water decrease of more than 5 ft from the previous year (Spring 2019).

During fall 2020, EMWD measured static depth-to-water in 135 wells in the Management Area. During the 2019-2020 calendar years, 118 sets of wells were measured for static depth-to-water in the Fall. Twenty-one (21) of the 118 sets of wells measured during Fall 2020, showed a depth-to-water increase of more than five (5) feet (ft) from the previous year (Fall 2019). Six (6) of the 118 sets of wells measured during Fall 2020 showed a depth-to-water decrease of more than 5 ft from the previous year (Fall 2019).

March Air Reserve Base also performs groundwater elevation monitoring in the Management Area. The data is summarized in the 2019-2020 Annual Monitoring Report, CG049 Basewide Groundwater Monitoring Program, Operable Unit 5.

Groundwater extraction in the Management Area totaled 19,858 acre feet (AF) in 2020. A total of 59 wells were monitored as part of the Groundwater Extraction Monitoring Program in 2020. Of the 59 wells, 47 (80%) were metered and 12 (20%) were estimated by EMWD. Of the 19,858 AF of groundwater extraction, 15,387 AF (77%) are metered and 4,471 AF (23%) were estimated by EMWD.

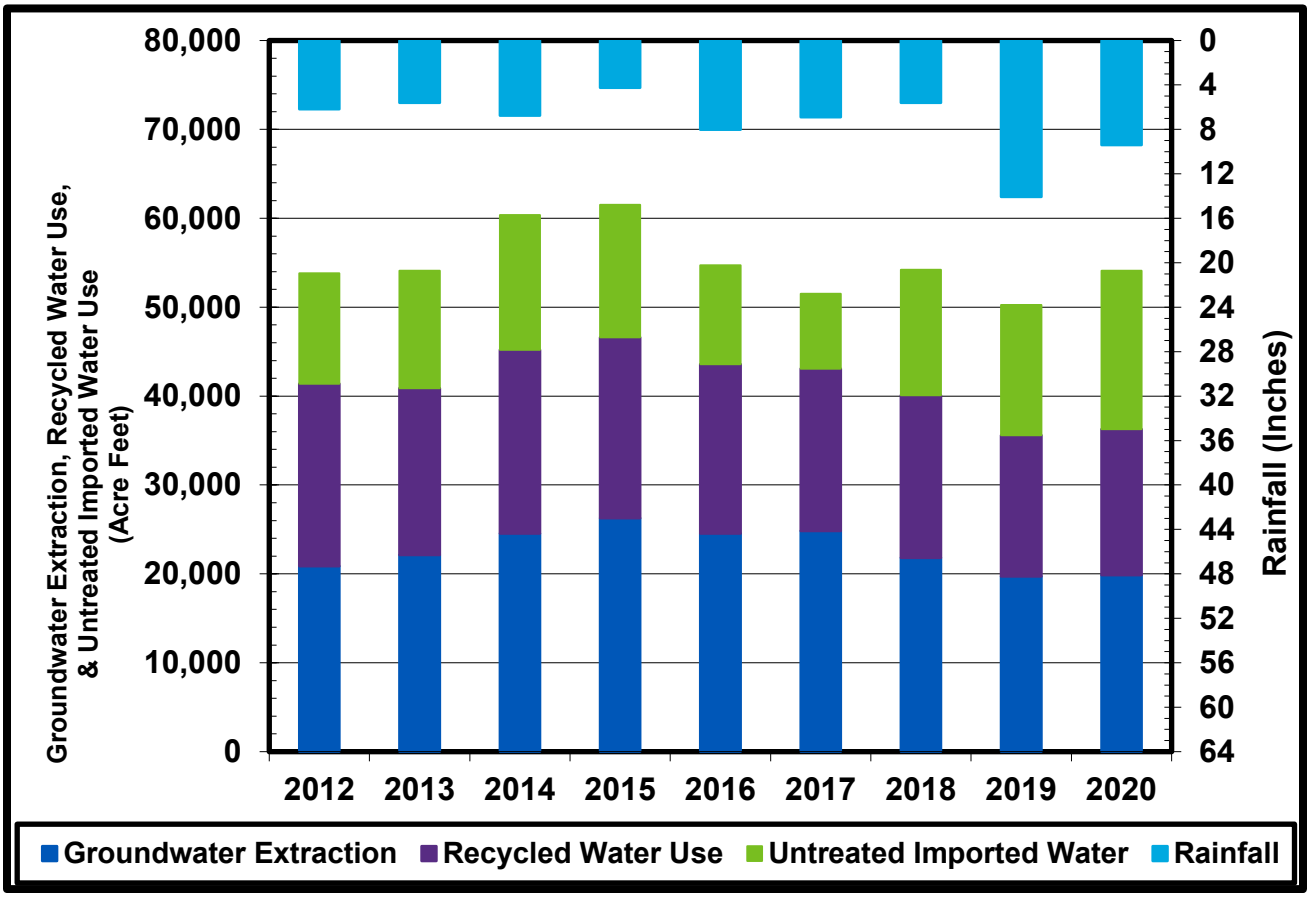
In 2020, recycled water usage accounted for 16,441 AF of demand in the Management Area. Fifty-four percent (54%) of the recycled water sold in the Management Area was used for agricultural irrigation, twenty-six percent (26%) was utilized for municipal and industrial usage, and the remaining twenty-one percent (21%) was used for irrigated landscaping, golf courses, construction, and habitat creation.

In 2020, imported raw water usage accounted for 17,811 AF of demand in the Management Area. Of the total imported untreated water, approximately 17,621 AF was imported State Water Project (SWP) water and approximately 191 AF originated from the Colorado River Aqueduct for use within the Management Area.

The Riverside County Flood Control and Water Conservation District maintains rainfall data for five stations in the Management Area. Precipitation in 2020 was 9.41 inches based on measurements from the Lake Perris station (Station 151), which is just below the 31-year

long-term average (1989-2021) of approximately 9.43 inches per year for the area. Figure 1-1 displays a summary of groundwater extraction, recycled water use, imported water use, and rainfall in the Management Area during 2020.

Figure 1-1: Groundwater Extraction, Recycled Water Use, Imported Water Use and Rainfall in the Management Area



Inactive wells and wells with open casings create the potential for groundwater contamination and may present a hazard for small children and animals. EMWD initiated the Inactive Well Capping/Sealing Program in 2000. In this program, inactive wells and wells which are no longer equipped for pumping are capped at no charge to the well owner. If feasible, a capped well will be added to the Groundwater Quality and Groundwater Level Monitoring Programs, thereby increasing the data points available for analysis. During 2020, eight wells (EMWD 39 Robinson LaMirada, EMWD 52 Follico, EMWD B8 Perris RWRF Open Casing, EMWD Trumble MW-1, EMWD Trumble MW-3, Perris Properties Ellis, Perris Properties San Jacinto, and Smith C Mapes OC) were capped in the Management Area as part of the Inactive Well Capping/Sealing Program. Seventy-five (75) wells have been capped in the Management Area since this program has been in existence.

1.2 Recommendations and Budget Summary

Chapter 3 presents the recommendations and goals of the Management Plan for the next year. EMWD's estimated 2021 budget totals $330,080. More details on the budget can be found in Chapter 5. Recommendations for 2021 Management Plan included:

- Continue the Groundwater Quality and Groundwater Level Monitoring Programs
- Continue the Groundwater Extraction Monitoring Program
- Continue the Inactive Well Capping/Sealing Program
- Continue to provide annual reports to well owners participating in the Groundwater Monitoring Programs
- Continue to pursue potential state or federal funding sources for the benefit of the Management Area
- Continue EMWD's Groundwater Salinity Management Activities, including
  - Perris Basin Desalination Program
  - Perris II Desalter and initiation of the monitoring described in the Perris II Reverse Osmosis Treatment Facility Monitoring and Reporting Plan
  - Iron and Manganese Removal Facilities
  - Brine Concentrate Management
- Continue the Operation of the North San Jacinto Water Supply Initiative
- Continue EMWD's participation in regional activities
  - Basin Monitoring Task Force
  - Total Maximum Daily Loading Task Force
  - Western Riverside County Agricultural Coalition

2 INTRODUCTION

The *West San Jacinto Groundwater Management Area 2020 Annual Report* (Annual Report) was prepared by Eastern Municipal Water District (EMWD) in accordance with the *West San Jacinto Groundwater Basin Groundwater Management Plan* (EMWD, 1995 [Management Plan]). The reporting period extends from January 1, 2020 through December 31, 2020.

The Annual Report is presented in the following chapters:

Chapter 1 **EXECUTIVE SUMMARY** – provides a summary of the report along with analysis and presentation of long-term trends.

Chapter 2 **INTRODUCTION** – provides an overview of the basis and purpose of the report, and a discussion on the Advisory Committee.

Chapter 3 **MANAGEMENT PLAN RECOMMENDATIONS AND GOALS** – provides an update on the status of the goals and recommendations from the previous year and discusses the recommendations for the next calendar year.

Chapter 4 **GROUNDWATER MANAGEMENT ZONE ACTIVITIES** – presents information on Groundwater Quality, Groundwater Level, and Groundwater Extraction Monitoring Programs; Recycled water use; Precipitation; the Inactive Well Capping/Sealing Program; County well permits; and additional activities, special issues, or programs affecting the entire Management Area and/or specific management zones.

Chapter 5 **ESTIMATED BUDGET** – presents the annual budget for the next year based upon the current year's activities and annual budget.

Chapter 6 **TABLES OF MONITORING PROGRAM SUMMARIES AND TRENDS** – presents tables of each monitoring program by groundwater management zone including the last five years of data (2015-2020).

Chapter 7 **FIGURES AND MAPS** – presents oversized figures and maps of the Management Area, the Groundwater Management Zones, the Monitoring Programs, and other related data included in the Annual Report.

Chapter 8 **APPENDICES** – presents the Stakeholder Advisory Group meetings presentations and information for references cited in this, and previous, Annual Reports.

2.1 Management Plan Description and History

The West San Jacinto Groundwater Management Area (Management Area) is located in the western portion of Riverside County within the San Jacinto River Watershed and includes the cities of Moreno Valley, Menifee, and Perris, as well as the unincorporated areas of Lakeview, Nuevo, and Winchester, as presented in Chapter 7, Figure 7-1. The Management Area covers approximately 256-square miles (over 164,200 acres) and has been divided into six (6) groundwater management zones as shown in Chapter 7, Figure 7-2. The Management Area encompasses water bearing sediments (aquifer materials), as well as essentially non-water bearing areas such as the Lakeview Mountains, the Bernasconi Hills and Mount Russell Range around Lake Perris, the Double Butte area near Winchester, and areas in the extreme northern and western portions of EMWD. Water purveyors in the Management Area are shown in Chapter 7, Figure 7-3.

EMWD adopted the Management Plan in June 1995 in accordance with Assembly Bill 3030 (AB3030) enacted in 1992, which is now codified in the California Water Code Sections 10750 through 10755. The Management Plan is intended to protect the vested interests of existing groundwater producers while providing a planning framework for new water supply projects for the benefit of groundwater producers and the public. The Management Plan goals include:

- Establishment of a Groundwater Basin Manager
- Monitoring of Groundwater Production
- Monitoring of Groundwater Level and Quality
- Development of Well Construction Policies
- Development of a Well Abandonment and Destruction Program
- Monitoring of Well Construction, Abandonment, and Destruction
- Groundwater Quality Protection
- Exchange of Agricultural and Other Non-potable Groundwater Production to Municipal Use
- Maximize Yield Augmentation with Local Resources – Local Runoff and Reclaimed Water
- Maximize Conjunctive Use
- Groundwater Treatment

Stakeholders in the Management Area include the cities of Moreno Valley, Perris, and Menifee; water purveyors such as EMWD, the Nuevo Water Company, and City of Perris Water; and private groundwater producers. EMWD oversees the Groundwater Monitoring Program within the Management Area. A well owner's participation in the Groundwater Monitoring Program is voluntary and at no cost to the well owner. Groundwater quality samples are taken annually, groundwater levels are measured semi-annually, and groundwater extraction is read monthly. EMWD provides these data to the well owners in the form of an Annual Well Owner’s Report.

2.2 Advisory Committee

In accordance with the Management Plan, an Advisory Committee was established. The purpose of the Advisory Committee is to:

1) Study, review, and provide comments and recommendations on all Management Plan activities;
2) Assist in the development of rules and regulations for the Management Plan and for groundwater resources evaluation projects; and
3) Evaluate feasibility plans, demonstration projects, and implementation plans.

The Advisory Committee consists of representatives of the cities, water purveyors, and private groundwater producers within the Management Area. The members representing the cities or water purveyors are appointed by their respective agencies.

Following EMWD's purchase of the Moreno Valley Mutual Water Company (MVMWC), the seat on the Advisory Committee formerly held by the MVMWC representative remained vacant until 2005 when the Advisory Committee determined that this vacant seat should be filled by the McCanna Ranch Water Company representative. During 2008, the City of Perris purchased the McCanna Ranch Water Company, and as a result, the seat was once again vacant. In 2011, the Advisory Committee determined that this vacant seat should be filled by the newly formed City of Menifee, but the City of Menifee has declined to participate. The Advisory Committee members and officers as of the August 2015 election are as follows:

Members:	Mrs. Essie Bootsma	Private Producer, John Bootsma Dairy
	Ms. Cindy Robbins	Nuevo Water Company
	Mr. Michael Oosten	Private Producer, Marvo Holsteins Dairy
	Mrs. Rae Beimer	City of Moreno Valley
	Mr. Joe Mouawad	Eastern Municipal Water District
	Mr. Stephen Ajobiewe	City of Perris
	Mr. Bruce Scott	Hemet-San Jacinto Liaison

At the March 2004 meeting, the Advisory Committee agreed to hold an annual meeting to review and approve the annual report and hold other meetings for specific purposes, to be either called by the Advisory Committee or requested by EMWD staff. At the November 23, 2010 meeting, the Committee agreed that status reports to the Advisory Committee will continue, but the frequency changed from monthly to quarterly.

In 2017, EMWD became the Groundwater Sustainability Agency (GSA) for the non-adjudicated portion of the San Jacinto Groundwater Basin. The area encompasses the cities of Moreno Valley, Perris and Menifee, and the surrounding unincorporated communities. The West San Jacinto Groundwater Sustainability Plan will replace the AB3030 groundwater management plan after the West San Jacinto GSP is adopted by the EMWD Board of Directors and is submitted by the January 31, 2022 deadline to the Department of Water Resources. The West San Jacinto Advisory Committee was reconfigured to form the West San Jacinto GSA Stakeholder Group and quarterly meetings were initiated in June 2019 to

discuss the development of the West San Jacinto GSP. In 2020, three quarterly SAG meetings were held. Copies of the SAG presentations are included in Chapter 8, Section 8.1.

2.3 Purpose of the Annual Report

This is the twenty-fifth (25th) Annual Report resulting from the Management Plan. This report documents activities and implementation of previously identified recommendations during the 2020 calendar year in the Management Area. The purpose of this report is to:

1) Compile, review, evaluate, and analyze the 2020 Groundwater Quality and Groundwater Level Monitoring Program data;
2) Summarize groundwater-related changes from previous years;
3) Review, analyze, and report the results of the 2020 Groundwater Extraction Monitoring Program;
4) Update the activities related to efforts in the various groundwater management zones;
5) Report on the status of efforts in response to recommendations presented in the 2019 Annual Report and identify the goals and recommendations for the next year;
6) Provide a technical document on the status of the groundwater management zones for future efforts.

3 MANAGEMENT PLAN RECOMMENDATIONS AND GOALS

The 2019 Annual Report included twelve recommended activities proposed for 2020 within the West San Jacinto Groundwater Management Area (Management Area). The status of the recommendations and the proposed goals for 2021 are outlined below.

3.1 Continue the Groundwater Quality and Groundwater Level Monitoring Programs

During 2020, 96 wells were sampled in the Management Area to assess groundwater quality. Groundwater levels were measured twice annually, spring and fall, to provide a time-series dataset of groundwater elevations, hydrologic conditions, and direction of groundwater flow. EMWD field personnel monitored spring and fall groundwater levels in 138 and 135 wells, respectively in 2020. These data were compiled and entered into the Regional Water Resources Database (RWRD) and subsequently utilized in the 2020 analyses and calculations. Water levels were collected for March Air Reserve Base and documented in the 2019-2020 Annual Monitoring Report, CG049 Basewide Groundwater Monitoring Program, Operable Unit 5.

Continuation of the Groundwater Quality and Groundwater Level Monitoring Programs are recommended to remain in effect for 2021. Available wells are to be sampled and measured for groundwater levels to provide a comprehensive dataset of groundwater elevations, direction of flow, and groundwater quality. In accordance with the monitoring programs, well owners will be provided copies of groundwater quality analyses and groundwater level measurements on an annual basis.

3.2 Continue the Groundwater Extraction Monitoring Program

A total of 59 major extraction wells within the Management Area were monitored under the 2020 extraction program. These wells were selected for the Program because annual pumping exceeded 25 acre feet (AF). Groundwater extractions were metered in 47 wells, while extractions from 12 wells were estimated by EMWD staff. Estimates for extraction wells are based on a property's acreage, crops, and/or number of livestock present. Additionally, EMWD checks metered extractions against the Annual Notices of Recordation of Groundwater Extraction filed by the well owner and reported to the State Division of Water Rights. This extra step provides a means to identify variances between estimates and recordations of metered wells.

It is recommended that the Groundwater Extraction Monitoring Program continue in 2021. It is believed that all significant groundwater extraction wells within the Management Area will continue to be accounted for, and the resulting extraction figures should be the most

comprehensive figures available. However, groundwater extractions for well owners not participating in the program are estimated, and estimation methods must be continually refined due to potentially changing land use.

3.3 Continue the Inactive Well Capping/Sealing Program

Under the Inactive Well Capping/Sealing Program, inactive wells and open casings (i.e., wells not equipped for pumping) are capped and/or sealed by EMWD field staff at no expense to the well owner. The capped wells may be subsequently used as monitoring wells to collect water level and/or water quality samples. During the 20 years the Program has been in existence, 75 wells in the Management Area have been capped. In 2020, eight wells (EMWD 39 Robinson LaMirada, EMWD 52 Follico, EMWD B8 Perris RWRF Open Casing, EMWD Trumble MW-1, EMWD Trumble MW-3, Perris Properties Ellis, Perris Properties San Jacinto, and Smith C Mapes OC) located in the Perris North, Perris South, and San Jacinto Lower Pressure Groundwater Management Zones were capped under this Program.

In 2021, EMWD will continue the Inactive Well Capping/Sealing Program to protect groundwater supplies in the Management Area from surface contamination. Open casing wells represent a potential direct pathway to groundwater contamination. Open casing wells are particularly vulnerable to the dumping of oil and waste products, as well as surface flows containing pollutants. Wells with larger casing diameters also pose a hazard that can trap animals and small children, especially once the area surrounding the wells becomes overgrown and obscured.

In cases where wells will not be capped, EMWD continues to coordinate with developers and the County of Riverside to identify and locate wells for proper abandonment and destruction within EMWD's service area.

3.4 Continue Providing Annual Reports to Well Owners Participating in the Groundwater Monitoring Programs

Annual Well Owner's Reports were provided to those well owners participating in the Groundwater Monitoring Programs. Participants were assisted with the filing of their Annual Notices of Recordation of Groundwater Extraction with EMWD and subsequent reporting to the State Division of Water Rights. First Notice forms were provided to owners of new wells or wells that were not previously recorded.

In June 2020, well owners participating in the monitoring programs were provided with copies of the 2019 water quality analyses, water level measurements, and annual groundwater extractions for each well they own within the Management Area.

The activities associated with the Annual Well Owner's Reports are scheduled to continue in 2021.

3.5 Continue Quarterly Reports to the Advisory Committee

In 2017, EMWD became the Groundwater Sustainability Agency (GSA) for the non-adjudicated portion of the San Jacinto Groundwater Basin. The West San Jacinto Advisory

Committee was reconfigured to form the West San Jacinto GSA Stakeholder Group and quarterly meetings were initiated in June 2019 to discuss the development of the West San Jacinto GSP. In 2020, three quarterly SAG meetings were held. Copies of the SAG presentations are included in Chapter 8, Section 8.1.

3.6 Continue to Pursue Potential State or Federal Funding Sources for the Benefit of the Management Area

Whenever possible, EMWD pursues potential local, State, and Federal funding sources for construction project subsidies, studies, and groundwater management. In 2020, EMWD applied for a number of grant opportunities available through the California Governor's Office of Emergency Services (Cal OES) and the U.S. Department of Energy (DOE).

EMWD will continue this practice to pursue potential state and federal funding sources in 2021.

3.7 Continue EMWD's Groundwater Salinity Management Program

As part of its effort to manage the salinity in the Management Area, EMWD supported the following projects in 2020:

3.7.a Perris Basin Desalination Program

During 2020, the Menifee and Perris I Desalters produced 3,150 AF and 4,110 AF of potable water for the Management Area, respectively, for a total of 7,260 AF. Additional details on this program is provided in Chapter 4, Section 4.7.a.

The Menifee and Perris I Desalters will remain in operation in 2021.

3.7.b Perris II Desalter

EMWD is currently constructing a third brackish groundwater desalination facility in the Management Area. Construction of the Perris II desalter (5.4 MGD) is anticipated to be completed in August 2021.

EMWD purchased property for the purpose of installing four new production wells which will provide additional brackish water supply to the new desalter. In 2016, equipping of Well 93 (Nuevo/Menifee) was completed and the well was placed into service in June 2016. Wells 95 (13th/Reservoir) and 96 (Santa Rosa) were drilled, tested and equipped in 2017 and placed into service in 2018. Equipping of Well 94 (12th/Reservoir) was completed in 2019 and placed into service on October 2019. Additional details on this project are provided in Chapter 4, Section 4.7.b.

3.7.c Iron and Manganese Removal Facilities

EMWD was awarded grant funding from the California Department of Public Health in the amount of $10 million for the construction of an iron and manganese removal facility. Construction was completed in 2013 and the facility began operation in 2014, which has resulted in a number of inactive desalter wells to re-enter active service. Additional details on these facilities is provided in Chapter 4, Section 4.7.c.

3.7.d Desalination Recovery Enhancement and Brine Concentrate Management

EMWD aims to increase the recovery of potable water for the Groundwater Salinity Management Program and is currently performing pilot-testing of new technologies to further concentrate the brine generated from the desalters.

Additional details on these projects may be found in Chapter 4, Section 4.7.

3.8 Continue Operation of the North San Jacinto Water Supply Initiative

EMWD initiated the North San Jacinto Water Supply Initiative in cooperation with local dairy farmers to reduce groundwater production by providing raw water via a pipeline completed in 2008.

In 2020, EMWD served 446 AF of raw water to the dairies, of which 191 AF was delivered within the Management Area. EMWD will continue to serve raw water to the dairies under this initiative in 2021.

Further information on the North San Jacinto Water Supply Initiative can be found in Chapter 4, Section 4.6.a.

3.9 Support EMWD's Participation in Regional Activities

3.9.a Basin Monitoring Task Force

As an outgrowth of the TIN/TDS Task Force, the agencies responsible for implementing the Basin Plan Amendments formed The Basin Monitoring Task Force. The Santa Ana Watershed Project Authority (SAWPA) was identified to administer/facilitate the Task Force. EMWD participates on the Task Force and attended meetings during 2020.

As part of the agreement to adopt the 2004 Basin Plan Amendment (Resolution No. R8-2004-0001), affected parties are required to complete a recomputation of ambient water quality for all groundwater management zones within the Santa Ana River Watershed once every three years. The latest report was completed in 2020 and is titled "*Recomputation of the Ambient Water Quality in the Santa Ana Watershed for the Period of 1999 to 2018."* The primary objective of this project is to compute current-ambient groundwater quality for TDS and nitrate-nitrogen in all 40 groundwater management zones in the Santa Ana River watershed. The Task Force also updated the Waste Load Allocation model for the Santa Ana River Watershed and projected allocations for the next 20 years. An addendum to the 2008 Santa Ana River Wasteload Allocation Model Report was completed in 2019.

3.9.b Total Maximum Daily Loading Task Force

Lake Elsinore and Canyon Lake were identified in 1994, 1998, and 2002 by the California Regional Water Quality Control Board, Santa Ana Region (Regional Board) on the Clean Water Act (CWA) Section 303(d) list of impaired waters for nutrients. In 2000, the Regional Board initiated the process to develop Total Maximum Daily Loads (TMDL) for nutrients for both Lake Elsinore and Canyon Lake (LECL), as required by the federal Clean Water Act and California's Nonpoint Source Pollution Control Plan. This process included the formation

of the LECL TMDL Task Force. EMWD participates in the LECL TMDL Task Force, which is comprised of local stakeholders, such as representatives from local cities, Riverside County, agricultural and dairy interests, environmental groups, as well as the regulatory community, interested in water quality issues within the San Jacinto Watershed.

Beginning in 2016, a Comprehensive Monitoring Work Plan was issued to include a focused reassessment of current conditions and establish an updated monitoring framework to better assess water quality trends towards meeting the existing TMDL numeric targets. During 2020, the Task Force continued to make progress on the task elements required by the Nutrient TMDL for LECL. The group continued with the monitoring program for Lake Elsinore and Canyon Lake (lakes) and conducted studies of the in-lake processes, watershed, and conducted compliance monitoring. Nutrient reduction actions were taken to include lake stabilization efforts, fish management strategies, and the addition of alum to bind nutrients in Canyon Lake. Efforts have been initiated to evaluate the current status and historic trends leading towards achievement of nutrient TMDL targets in the lakes, determine the degree of influence of natural background sources, and distinguish and quantify external pollutant loading from upstream watersheds including agricultural, urban, and open space sources.

3.9.c Western Riverside County Agricultural Coalition

The Western Riverside County Agricultural Coalition (WRCAC) is a 501(c) 3 non-profit organization comprised of dairy and agricultural operators interested in environmental issues affecting the agricultural community in the San Jacinto Watershed. WRCAC is currently the representative for agricultural and dairy interests on the Lake Elsinore and Canyon Lake Total Maximum Daily Loading (LECL TMDL) Task Force and has participated in this capacity since 2005.

WRCAC has recently completed an additional Total Maximum Daily Load (TMDL) cycle for both dairy operators and agricultural operators; continues work on a USDA Conservation Innovation grant; and is actively participating in the revision to the TMDL process for dairy and agricultural operators on the Lake Elsinore/Canyon Lake TMDL Task Force.

Areas of emphasis for 2020 included, but were not limited to, the following:

1. Continued assistance to all dairy and stakeholders
2. TMDL revisions review and making certain agriculture and dairy source data is correct, provide assistance
3. AgNMP revise after TMDL revision is complete
4. Pursue grant opportunities as available
5. Evaluate AWS Technology on regional basis

3.9.d San Jacinto River Watershed Council

The San Jacinto River Watershed Council has been closed permanently.

3.9.e March Air Reserve Base Groundwater Modeling Effort

During 2020, EMWD and MARB continued to voluntarily participate in a data exchange program to fully support the goals of each agency. Data exchange will continue in 2021.

3.9.f City of Perris Sale of Water System

On November 7, 2017, the City of Perris voters voted yes to Measure H that allowed the city to sell the water systems to Liberty Utilities (Park Water) Corp. On May 9, 2018, Liberty Utilities (Park Water) Corp. filed Application No. 18-05-011 with the California Public Utilities Commission requesting authority to purchase the City of Perris's Municipal Water Systems. On June 19, 2020, the California Public Utilities Commission indicated that Liberty Utilities did not provide voters with the appropriate written, pre-election notice. Thereby denying the application from Liberty Utilities to purchase the City of Perris's Municipal water system,

3.10 Continue the Implementation of EMWD's Key Well Program

EMWD initiated the implementation of a Key Well Program to increase the precision and efficiency of the groundwater monitoring effort. Areas of Key Well deficiencies were identified and efforts to locate parcels for new monitoring wells in these areas continued in 2020. In addition, potential sources of funding for the installation of automated data-logging transducers in existing Key Monitoring Wells are currently being identified.

It is anticipated that during 2021, the San Jacinto Watershed Groundwater Model will continue to be utilized to confirm and/or identify areas of Key Well deficiencies.

3.11 Utilization of the San Jacinto Watershed Groundwater Model

EMWD has completed its efforts to update the existing San Jacinto Watershed Groundwater Model. Significant revisions were made to the geometry of the conceptual model. Calibration of the model by a consultant was completed in 2015. During 2017, predictive scenarios were developed for the March Air Reserve Base Groundwater Recovery Program. The groundwater model was also used by the Department of Water Resources to simulate underflow below the Perris Dam. In 2020, the groundwater model was also used for development of the San Jacinto Groundwater Basin Groundwater Sustainability Plan and the Perris North Basin Groundwater Contamination Remediation and Prevention Program.

3.12 Reconfiguration of West San Jacinto Advisory Committee to the Technical Advisory Committee

In 2017, EMWD became the GSA for the western portion of the San Jacinto Groundwater Basin. The West San Jacinto Groundwater Sustainability Plan will replace the AB3030 groundwater management plan. The West San Jacinto Advisory Committee wase reconfigured to form a West San Jacinto GSA Stakeholder Group that will include members of the West San Jacinto Advisory Committee as well as additional Basin Stakeholders. Stakeholder Advisory Group meetings were initiated on June 26, 2019 and continued on a quarterly basis.

4 GROUNDWATER MANAGEMENT ZONE ACTIVITIES

4.1 The Groundwater Management Zones and the Basin Plan Update

According to the *West San Jacinto Groundwater Basin Groundwater Management Plan* (EMWD, 1995 [Management Plan]), the West San Jacinto Groundwater Management Area (Management Area) is located in western Riverside County within the San Jacinto River Watershed portion of the greater Santa Ana River Watershed as shown in Chapter 7, Figure 7-1. The 256-square mile Management Area (more than 164,200 acres) includes the cities of Moreno Valley, Menifee, and Perris, as well as the unincorporated areas of Lakeview, Nuevo, and Winchester. The Management Area is divided into six (6) groundwater management zones comprised of water bearing materials (aquifers), as well as essentially non-water bearing areas such as the Lakeview Mountains, the Bernasconi Hills and Mount Russell Range around Lake Perris, the Double Butte area near Winchester, and areas in the extreme northern and western portions of the District.

The Santa Ana Regional Water Quality Control Board is responsible for adopting and implementing a water quality control plan and waste discharge requirements for the Santa Ana River Watershed. The State Water Resources Control Board adopted and approved the first Water Quality Control Plan for the Santa Ana River Basin (Basin Plan) in 1975. The most recent Basin Plan amendment was approved in early 2004. This amendment included changes in groundwater Basin Plan objectives, boundaries, and subbasin nomenclature. The nomenclature of the amendment was also revised and groundwater subbasins are now identified as groundwater management zones. Chapter 7, Figure 7-2 shows the boundaries of the groundwater management zone and the current Basin Plan water quality objectives for each groundwater management zone. Water purveyors in the Management Area are shown in Chapter 7, Figure 7-3.

4.2 Groundwater Monitoring Programs

EMWD oversees the Groundwater Monitoring Programs which have been developed for the Management Area. Well owner participation in these Groundwater Monitoring Programs is voluntary. Groundwater quality samples are taken annually, groundwater levels are measured semi-annually, and groundwater extraction is read monthly. Chapter 7, Figure 7-4 shows the locations of the wells participating in the 2020 Groundwater Monitoring Programs, including the March Air Reserve Base (MARB) wells that were reported to EMWD.

Annual Well Owner's Reports for calendar year 2019 were provided to well owners participating in the Groundwater Monitoring Programs in June 2020. These reports contained the results of semi-annual groundwater level measurements, annual groundwater quality

sampling, and annual groundwater extractions for calendar year 2019. Annual Well Owner's Reports for calendar year 2020 were provided to well owners participating in the Groundwater Monitoring Programs in February 2021.

4.2.a Groundwater Quality Monitoring Program

Groundwater quality samples are taken annually and EMWD assumes the cost of the analyses. Generally by June of each year, participants receive copies of their groundwater quality analyses from the previous calendar year.

Groundwater quality samples are collected using either a dedicated pump or mobile pump. In accordance with EMWD's standard operating procedures, depth to groundwater readings are taken, then a minimum of three (3) well volumes of water are purged from the well prior to collecting a groundwater quality sample. Samples are collected in bottles following standardized sampling protocols and transported to the laboratory for analysis. Constituents tested in a typical groundwater quality sample are listed in Table 4-1 below.

Table 4-1: Constituents Tested in a Typical Groundwater Quality Sample

Type	Constituent:	Type	Constituent:
Cations	Calcium (Ca)	Metals	Boron (B)
	Magnesium (Mg)		Copper (Cu)
	Potassium (K)		Iron (Fe)
	Silica (SiO_3)		Manganese (Mn)
	Sodium (Na)		Zinc (Zn)
	Hardness (Calculated from Ca/Mg)	Alkalinity	Bicarbonate (HCO_3)
Anions	Chloride (Cl)		Carbonate (CO_3)
	Fluoride (F)		Hydroxide (OH)
	Nitrate as Nitrogen (NO_3-N)		Total Alkalinity as Ca CO_3
	Sulfate (SO_4)	Misc.	Electrical Conductance (EC)
Nitrogen	Ammonia as Nitrogen (NH_3-N)		Temperature at Collection
	Nitrite as Nitrogen (NO_2-N)		pH
			Total Dissolved Solids (TDS)

Tables 4-2 and 4-3 show the number of wells sampled, the number of wells within each range of values for Total Dissolved Solids (TDS) and Nitrate as Nitrogen (NO3-N) in milligrams per liter (mg/L), and the minimum and maximum detection of TDS and NO3-N for each groundwater management zone for 2020. TDS has a secondary Maximum Contaminant Level (MCL) concentration of 500 mg/L and NO3-N has a primary MCL concentration of 10 mg/L.

During the 2020 groundwater quality monitoring effort, groundwater quality samples were collected from a total of 96 wells located in the Management Area. Ninety-five (95) samples were analyzed for TDS. Ten (10) of the ninety-five (95) samples analyzed for TDS reported values below the secondary MCL of 500 mg/L. Eighty-five (85) of the 95 samples analyzed for TDS reported values above the secondary MCL of 500 mg/L. The highest TDS concentration in the Management Area was 16,900 mg/L reported for well EMWD-Skiland 02, located in the Perris South groundwater management zone. EMWD-Skiland 02 reported a TDS concentration of 23,000 mg/L in 2019 and 9,600 mg/L in 2018. The lowest TDS value reported was 239 mg/L reported for well Fish & Game West, located in the Lakeview groundwater management zone. Fish & Game West reported TDS concentrations of 270 mg/L and 268 mg/L in 2017 and 2018, respectively. A summary of the TDS groundwater quality is presented in Table 4-2 below.

Table 4-2: 2020 TDS Groundwater Quality Monitoring in the Management Area

TDS Concentration (mg/L)	Hemet South (Partial)	Lakeview	Menifee	Perris North	Perris South	San Jacinto Lower Pressure	Total
0-500	0	4	0	4	1	1	**10**
500-750	2	12	0	2	3	1	**20**
750-1,000	0	0	1	2	8	0	**11**
1,000-1,500	0	3	1	1	12	0	**17**
1,500-3,000	0	7	2	1	16	1	**27**
> 3,000	0	0	1	0	9	0	**10**
Total	**2**	**26**	**5**	**10**	**49**	**3**	**95**
Minimum*	**652**	**239**	**860**	**394**	**390**	**376**	**239**
Maximum*	**702**	**3,000**	**3,180**	**1,650**	**16,900**	**1,810**	**16,900**

*Well with minimum and maximum values in 2020 vary from the wells with minimum and maximum values in 2019.

Ninety-six (96) samples were analyzed for nitrate as nitrogen (NO3-N). Eighty (80) of the ninety-six (96) samples analyzed for nitrate as nitrogen (NO3-N) reported values below the primary MCL of 10 mg/L for NO3-N. Sixteen (16) of the 96 samples analyzed for NO3-N reported values above the primary MCL of 10 mg/L. The highest NO3-N concentration measured in the Management Area was 25.1 mg/L reported for well, EMWD 46 Edgemont 02, located in the Perris North groundwater management zone. EMWD 46 Edgemont 02 reported NO3-N concentrations of 23.8 mg/L and 26 mg/L in 2018 and 2019, respectively. The lowest sample concentrations were “non-detects” for wells located in the Lakeview portion of the Lakeview/Hemet North, Perris North, Perris South, and San Jacinto Lower Pressure groundwater management zones.

Table 4-3: 2020 NO3-N Groundwater Quality Monitoring in the Management Area

NO3-N Concentration (mg/L)	Hemet South (Partial)	Lakeview	Menifee	Perris North	Perris South	San Jacinto Lower Pressure	Total
0-2.5	0	16	0	5	18	2	**41**
2.5-5	0	3	2	1	9	0	**15**
5-7.5	0	1	2	1	6	0	**10**
7.5-10	0	2	1	1	10	0	**14**
10-20	2	4	0	1	6	1	**14**
> 20	0	0	0	1	1	0	**2**
Total	**2**	**26**	**5**	**10**	**50**	**3**	**96**
Minimum*	**13**	**ND**	**2.9**	**ND**	**ND**	**ND**	**ND**
Maximum*	**14.2**	**19.6**	**8.8**	**25.1**	**20.6**	**10.2**	**25.1**

*Well with minimum and maximum values in 2020 vary from the wells with minimum and maximum values in 2019

A map showing TDS and diagrams of graphic representations (i.e., stiff diagrams) for 2020 water quality characteristics at individual wells is shown in Chapter 7, Figure 7-5. NO_3-N concentrations for wells in the Management Area are presented in Chapter 7, Figure 7-6.

The highest and lowest concentrations of TDS and NO_3-N in mg/L for each management zone for 2016 through 2020 are summarized in Chapter 6, Table 6-1. It should be noted that the same wells were not necessarily sampled each year due to access and usage issues, which may cause artificial fluctuations in some of the high and low values. It should also be noted that groundwater quality and the character of groundwater are affected by a number of factors including: type and mineral content of sediments, recharge and drainage patterns, historic land use practices, well screen intervals, and total well depth.

4.2.b Groundwater Level Monitoring Program

The purpose of this program is to characterize basin hydrology and evaluate groundwater flow conditions. Water level measurements are taken twice annually, in the spring and fall. Copies of the results are provided to the participating well owners each subsequent year. The set of available wells varies from year to year due to reasons ranging from changes in access agreements to physical well access and usage of the well.

Common practice requires that a well is turned off at least 24 hours prior to measuring a static water level. In some cases, a well may be in use during either of the two semi-annual sampling events, making the measuring of static water levels impractical at that location.

During Spring 2020, static depth-to-water measurements were collected in 138 wells within the Management Area. During the 2019-2020 calendar years, 130 wells were measured for static depth-to-water in the Spring. Twenty-two (22) of the 130 wells measured during both Spring 2019 and Spring 2020 showed a depth-to-water increase of more than five (5) feet (ft) from the previous year (Spring 2019). Two (2) of the 130 wells measured during both Spring 2019 and Spring 2020 showed a depth-to-water decrease of more than 5 ft from the previous year (Spring 2019). During that same time period water levels were collected for March Air Reserve Base and documented in the 2019-2020 Annual Monitoring Report, CG049 Basewide Groundwater Monitoring Program, Operable Unit 5. Table 4-4 shows the number of measurements collected in each groundwater management zone and the number of wells where depth-to-water measurements increased or decreased more than 5 feet from the previous year (2019). The minimum and maximum depths to groundwater collected in Spring 2020 for each groundwater management zone are also summarized in Table 4-4.

Table 4-4: Spring 2020 Groundwater Level Monitoring in the Management Area

Groundwater Management Zone	Wells Measured Spring 2020	Spring 2019-2020 Wells	Depth to Water Increase ≥ 5 ft	Depth to Water Decrease ≥ 5 ft	Minimum Depth to Water (ft)	Maximum Depth to Water (ft)
Lakeview	24	4	9	1	90.5	221.2
Perris North	25	24	3	0	10.3	85.3
Perris South	58	54	0	1	3.1	97
San Jacinto Lower Pressure	14	14	1	0	66.4	250.1
Menifee	13	12	9	0	68.7	102.1
Hemet South (partial)	4	22	0	0	45.1	49.9
Totals	**138**	**130**	**22**	**2**	**3.1**	**250.1**

During fall 2020, static depth-to-water measurements were collected in 135 wells in the Management Area. During the 2019-2020 calendar years, 118 sets of wells were measured for static depth-to-water in the Fall. Twenty-one (21) of the 118 sets of wells measured during Fall 2020, showed a depth-to-water increase of more than five (5) feet (ft) from the previous year (Fall 2019). Six (6) of the 118 sets of wells measured during Fall 2020 showed a depth-to-water decrease of more than 5 ft from the previous year (Fall 2019). Water levels were collected for March Air Reserve Base and documented in the 2019-2020 Annual Monitoring Report, CG049 Basewide Groundwater Monitoring Program, Operable Unit 5. Generally, directions of groundwater flow are similar to those of previous years. Table 4-5 shows the number of measurements collected in Fall 2020 for each groundwater management zone and the number of wells where depth-to-water measurements increased or decreased more than 5 feet from the previous year (2019).The minimum and maximum depths to groundwater collected in Fall 2020 for each groundwater management zone are also summarized in Table 4-5.

Table 4-5: Fall 2020 Groundwater Level Monitoring in the Management Area

Groundwater Management Zone	Wells Measured Fall 2020	Fall 2019-2020 Wells	Depth to Water Increase ≥ 5 ft	Depth to Water Decrease ≥ 5 ft	Minimum Depth to Water (ft)	Maximum Depth to Water (ft)
Lakeview	25	21	5	0	92.3	223.5
Perris North	22	21	8	3	15.8	84.7
Perris South	54	51	2	1	9.9	88
San Jacinto Lower Pressure	20	13	3	0	7.4	252.2
Menifee	12	10	3	2	70	96.2
Hemet South (partial)	2	2	0	0	53.1	54.4
Totals	**135**	**118**	**21**	**6**	**7.4**	**252.2**

A comprehensive accounting of wells measured from 2016 through 2020 is provided in Chapter 6, Table 6-2. A map showing the change in groundwater elevation from Spring 2019 to Spring 2020 is shown in Chapter 7, Figure 7-7. A map showing the change in groundwater elevation from Fall 2019 to Fall 2020 is shown in Chapter 7, Figure 7-8.

4.2.c Groundwater Extraction Monitoring Program

This monitoring program collects groundwater extraction data in order to develop an understanding of aquifer yield and health in the Management Area. This program involves the metering of significant (> 25 acre feet per year) extraction wells. The cost of installing meters and monitoring of metered wells is borne by EMWD. Groundwater extraction data is developed from a variety of sources including:

- Meters installed and monitored by EMWD;
- Privately owned meters monitored by EMWD staff;
- Meters monitored by other agencies and reported to EMWD; and
- Estimates based on land use, acreage under cultivation, type of crop, and/or number of livestock.

The results are provided to the participating well owners to assist them in filing their Annual Recordation Notices of Groundwater Extraction. There were 59 wells monitored as part of the Groundwater Extraction Monitoring Program in 2020. Table 4-6 provides the 2020 groundwater extraction activities by groundwater management zone. Of the 59 wells, 47 (80%) were metered and 12 (20%) were estimated by EMWD. In terms of actual groundwater extractions in 2020, 15,387 AF (77%) were metered and 4,471 AF (23%) were estimated by EMWD, for a total extraction of 19,858 AF. In comparison, groundwater extraction for 2019 in the Management Area totaled 19,726 AF. Historical results from the Groundwater Extraction Monitoring Program effort for 2016 through 2020 are provided in Chapter 6,

Tables 6-3 and 6-4. Chapter 6, Table 6-10 summaries the 2020 monthly groundwater production in the Management Area.

Table 4-6: 2020 Groundwater Extraction Monitoring in the Management Area

Management Zone	No. of Wells Metered	No. of Wells Estimated	Total Number of Wells	Groundwater Extraction Metered (AF)	Groundwater Extraction Estimated (AF)	Total Groundwater Extraction (AF)
Lakeview	18	1	19	3,620	0	3,620
Perris North	7	1	8	3,098	260	3,358
Perris South	12	2	14	8,131	90	8,221
San Jacinto Lower Pressure	3	3	6	129	50	179
Menifee	4	5	9	386	4,071	4,457
Hemet South (partial)	3	0	3	23	0	23
Total	47	12	59	15,387	4,471	19,858

Available data on groundwater extractions can also be obtained from the California Water Resources Control Board, Division of Water Rights (State). The State has microfiche records of filings from 1947 through 1985. From 1985 forward, records are kept as hard copy and a database has also been generated by the State. Actual groundwater extraction in most areas may be higher than the State recordation because not all groundwater producers file annual notices with the State. However, in a few instances the amount reported by individual well owners to the State exceeds the amounts measured in the Groundwater Extraction Monitoring Program.

Since many of the discrepancies occurred on metered wells, it can be assumed that either the State figures are inaccurate or the reporting well owner made an error. After checking the compilation process and an analysis of acreage and crop use, it was confirmed that the Groundwater Extraction Monitoring Program values compiled by EMWD were the most accurate figures available. Chapter 6, Table 6-5 shows extraction amounts for the years 2015 through 2019 as reported to and recorded by the State. A listing of zero indicates that the State had no recordation figures for that groundwater management zone for that year. It may or may not represent zero groundwater extraction.

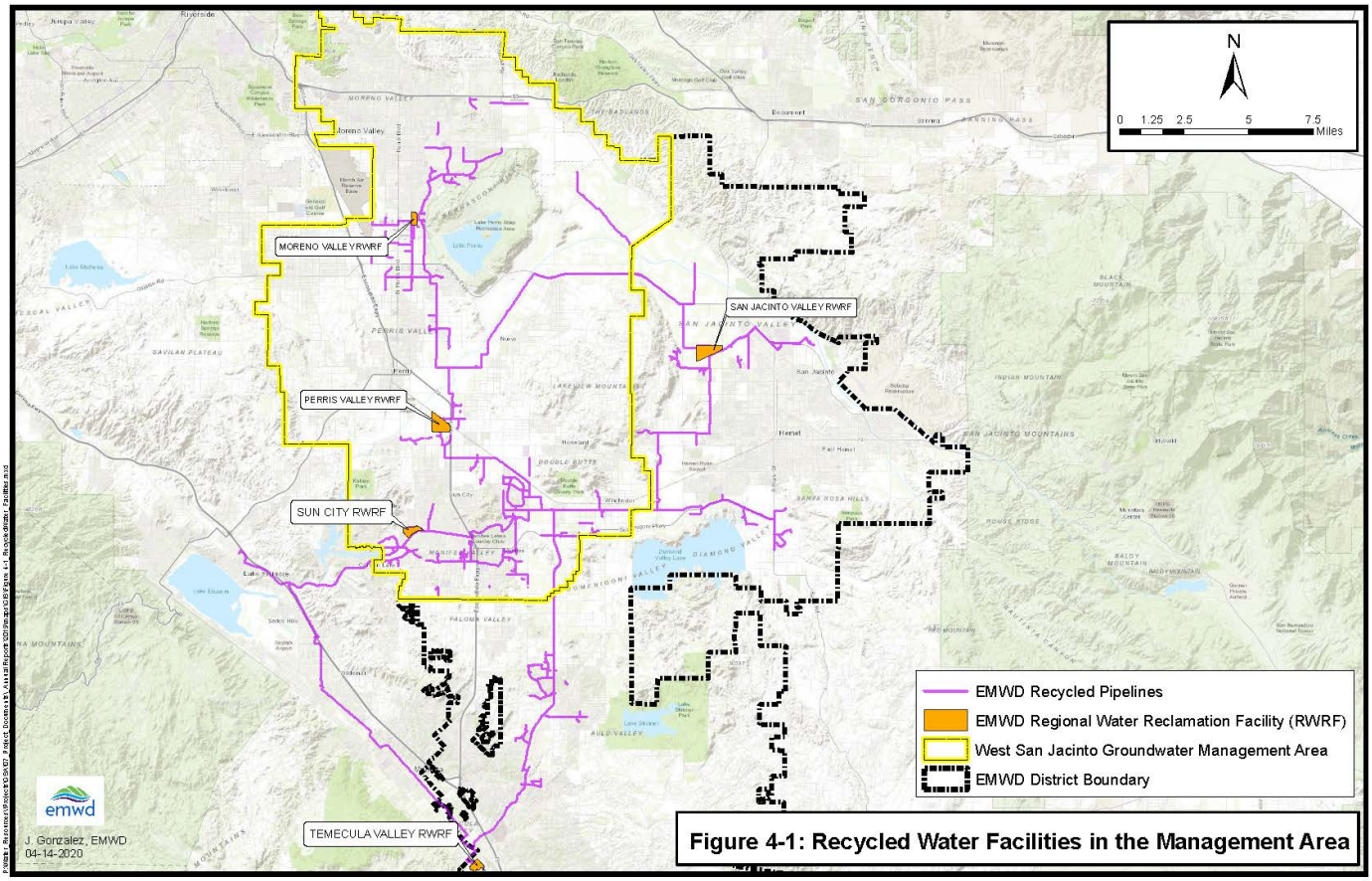
In accordance with the statutes in the Water Code that were enacted by the State with the adoption of Assembly Bill 2733 in September 2004, the procedures for the filing of the notices of extraction have changed. As a result, EMWD assumed responsibility for administration of the San Jacinto Watershed Groundwater Recordation Program within

its service area in the San Jacinto Watershed. EMWD set the notices of extraction for calendar year 2020 to all well owners in February 2021, which were due by March 31, 2021.

4.3 Recycled Water Monitoring

EMWD owns five regional water reclamation facilities. Three (3) are located in Moreno Valley, Perris Valley, and Sun City, respectively, and are located in the Management Area; and two (2) in San Jacinto Valley and Temecula Valley, respectively, are not located within the Management Area. The Sun City facility has not been in operation since 1996 and is not currently planned to return to operation. Figure 4-1 shows the recycled water facilities in the Management Area.

Figure 4-1: Recycled Water Facilities in the Management Area



Recycled water use in the Management Area totaled 16,441 AF in 2020 as shown in Table 4-7. Fifty-four percent (54%) of the recycled water sold in the Management Area was used for agricultural irrigation, twenty-six percent (26%) was utilized for municipal and industrial usage, and the remaining twenty-one percent (21%) was used for irrigated landscaping, golf courses, construction, and habitat creation. Chapter 6, Table 6-6 presents recycled water use by groundwater management zone for 2016 through 2020.

Table 4-7: 2020 Recycled Water Use in the Management Area

Management Zone	Recycled Water Use (AF)
Lakeview	4,696
Perris North	1,028
Perris South	3,723
San Jacinto Lower Pressure	5,953
Menifee	779
Hemet South (partial)	262
Total	**16,441**

During 2020, the Moreno Valley Regional Water Reclamation Facility treated a total of 11,118 AF of wastewater. Expansion of the treatment plant facility to total plant capacity of 21 MGD is completed.

The Perris Valley Regional Water Reclamation Facility treated a total of 15,419 AF of wastewater during 2020. Expansion of the treatment plant facility to a total plant capacity of 22 MGD was completed in 2014. Further expansion of plant capacity to 30 MGD is in preliminary design phase and is scheduled for completion in 2033.

4.4 Precipitation Monitoring Program

The Riverside County Flood Control and Water Conservation District maintains rainfall data in the Management Area for five representative stations. Precipitation reported in 2020 was 9.41 inches from the Lake Perris Rain Station, which was slightly lower than 31-year average (1989-2020) of 9.43 inches per year for the area as shown in Table 4-8.

Table 4-8: 2020 Precipitation (inches) in the Management Area

Period	Precipitation Station				
	Lakeview*	Lake Perris	Moreno Valley East*	Sun City	Winchester
30 Year Average	1910-2012	1989-2020	2001-2020	1989-2020	1989-2020
	11.65	9.43	11.45	10.33	10.28
2020	-	9.41	9.74	9.57	10.58

* Data does not represent a 30-year average period.

The available precipitation data for 2014 through 2020 are provided in Chapter 6, Table 6-7. Some stations have closed, changed location over time, or have been added. For example,

the Moreno Valley station closed in 2001, while another station, the Moreno Valley East station, has been online since 2001.

4.5 Inactive Well Capping/Sealing Program

Inactive, unused wells present a potential source of groundwater contamination as they can act as a direct conduit from the surface to the regional groundwater aquifer. Wells with open casings are especially vulnerable to contamination from surface flows or vandalism such as the dumping of oil or other waste products. Open casings larger than 16 inches in diameter also present a fall hazard to small children and animals. As a public service and to protect groundwater supplies, EMWD will cap an inactive well by welding a bolted or locking cap to the well casing at no charge to the well owner. Capping wells instead of destroying them allow the wells to be used for water level and/or water quality monitoring. Priority is given to those wells that are potentially dangerous open holes (casings larger than 16 inches), wells located in potential flood areas, and wells located in areas with minimal existing monitoring.

In the Management Area, EMWD has capped and sealed twenty-three (23) municipal, seven (7) state, and forty-five (45) private wells thus far. EMWD has also capped wells in the Hemet/San Jacinto Valley area, adjacent to the Management Area. In some instances, recently capped wells were quite old and only recently discovered by the property owner, who was not the original well owner. Table 4-9 lists the number of wells capped and sealed by EMWD in each management zone in 2020, and since program implementation in year 2000, in the Management Area. In 2020, eight wells (EMWD 39 Robinson LaMirada, EMWD 52 Follico, EMWD B8 Perris RWRF Open Casing, EMWD Trumble MW-1, EMWD Trumble MW-3, Perris Properties Ellis, Perris Properties San Jacinto, and Smith C Mapes OC) were capped in the Management Area as part of the Inactive Well Capping/Sealing Program. Chapter 7, Figure 7-9 shows the capped/sealed well locations. A listing of wells capped/sealed from 2016 through 2020, and since program implementation in year 2000, is presented in Chapter 6, Table 6-8.

Well owners who have, or know of, an old, unused well are encouraged to call the EMWD Water Resources and Facilities Planning Department for well capping consideration.

Table 4-9: 2020 Inactive Wells Capped/Sealed in the Management Area

Management Zone	2020	Overall Total
Lakeview	0	11
Perris North	1	10
Perris South	6	32
San Jacinto Lower Pressure	1	11
Menifee	0	11
Hemet South (partial)	0	0
Total	8	75

4.6 Imported Water

4.6.a North San Jacinto Water Supply Initiative

At the request of property owners in the Lakeview/Hemet North, San Jacinto Lower Pressure, and San Jacinto Upper Pressure Management Zones, EMWD undertook the North San Jacinto Water Supply Initiative. Issues of concern were: rising groundwater levels in management zones with poor quality groundwater; falling groundwater levels in management zones with good water quality; and the threatened loss of local groundwater supplies.

As a part of this effort, local dairy farmers along the Ramona Expressway worked cooperatively with EMWD to reduce groundwater production and construct a pipeline along Ramona Expressway to serve raw water to the area. In 2008, all facilities were completed, agreements were executed with the dairymen, and the pipeline became operational and began serving raw water to the dairymen. EMWD has a raw water connection to Metropolitan Water District (MWD) (EM-1), which provides untreated Colorado River Water (CRW) to four dairy property owners in the Management Area. Figure 4-2 shows the imported water facilities in the Management Area.

During 2020, a total of 446 AF of raw imported water was served to the dairymen, with 191 AF of that amount used in the Management Area.

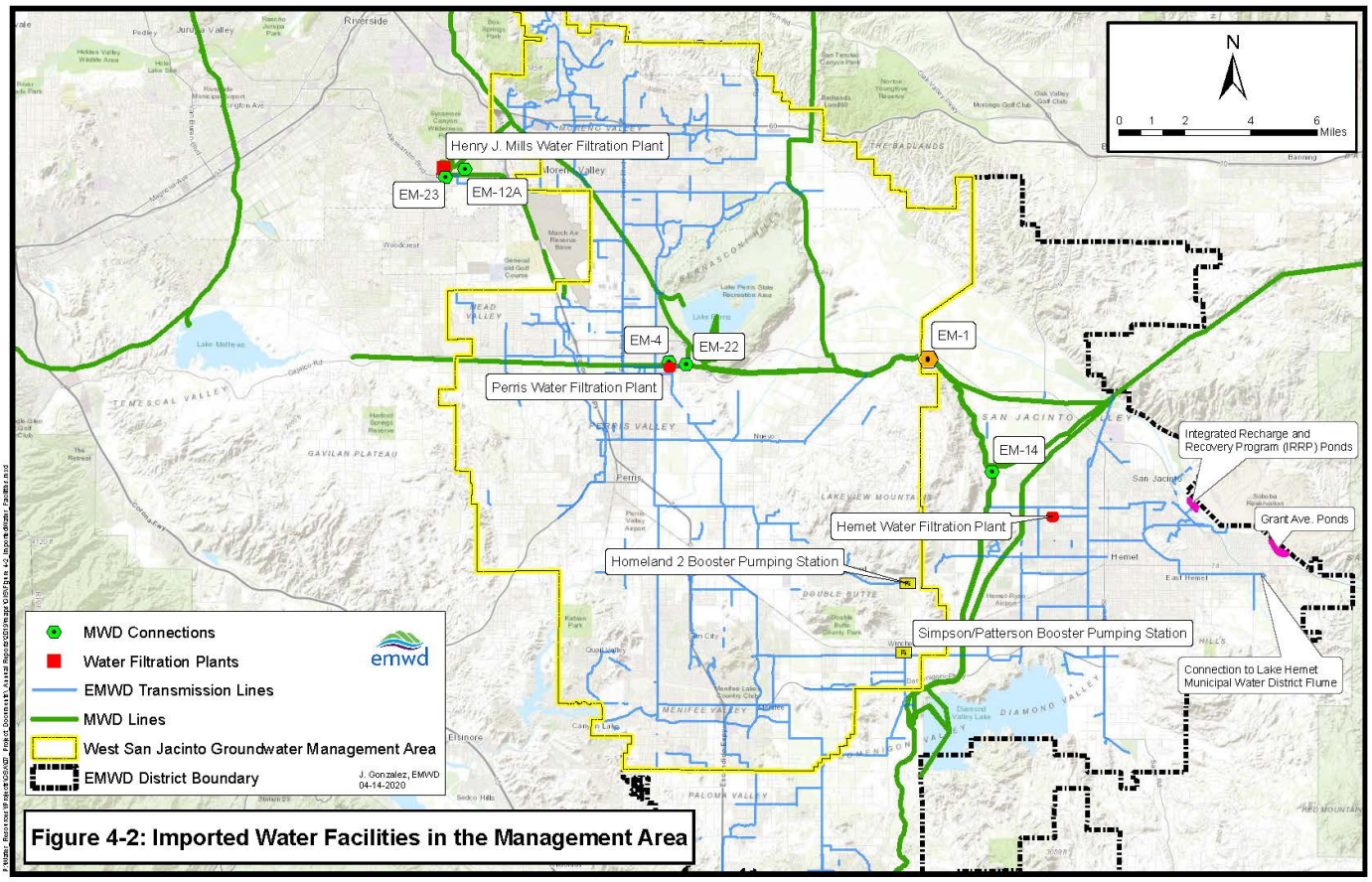
4.6.b Perris Water Filtration Plant

Construction on the Perris Water Filtration Plant began in 2001 to treat up to 11,000 AFY of imported untreated Colorado River Water (CRW) to potable water quality standards. It is located approximately one mile west of Lake Perris. During 2008, upgrades to the micro-filtration plant were completed including expansion of total plant capacity to up to 22,000 AFY, and construction of a pipeline to bring untreated State Water Project (SWP) water to the facility to improve water quality. Further plant expansion is planned for completion in April 2026, which increases the plant's capacity

up to 33,000 AFY. CRW can enter the EMWD distribution system from the Perris Water Filtration Plant (EM-4). EMWD receives a blend of SWP water and CRW supplies from the MWD Skinner Water Filtration Plant via the Auld Road Booster Pumping Station (EM-17). Untreated SWP water can enter the Perris Water Filtration Plant from EM-22 turnout.

In 2020, the Perris Water Filtration Plant treated 13,661 AF of which 17 AF was exported outside of the Management Area. Imported treated water (3,976 AF) was brought into the Management Area via the Simpson/Patterson Booster Pump Station. Figure 4-2 shows the imported water facilities in the Management Area.

Figure 4-2: Imported Water Facilities in the Management Area



4.7 Groundwater Salinity Management Program

4.7.a Perris Basin Desalination Program

The Perris and Menifee Desalters are located at the Sun City Regional Water Reclamation Facility site and have a combined production capacity of 7,840 AF/Y. In 2020, the Menifee Desalter produced 3,138 AF, and the Perris Desalter produced 3,895 AF, of potable water for a total of 7,032 AF for the Management Area.

In 2020, the 9,050 AF of brackish groundwater produced for the desalters were provided by wells; 76 McLaughlin, 81 Antelope/Watson, 82 Mapes/Sherman, 83 Ellis/Sherman, 84 Ellis/Bradley, 86 Murrieta/San Jacinto, 87 Nuevo/Olivas, 88 Pico/San Jacinto, 93 Nuevo, 95 13th Street, and 96 Santa Rosa. During 2020, desalter wells 75 Salt Creek, 85 Murrieta/Salt Creek, 89 Ethanac II, and 94 12th Street were offline. Figure 4-3 shows the salinity management facilities in the Management Area.

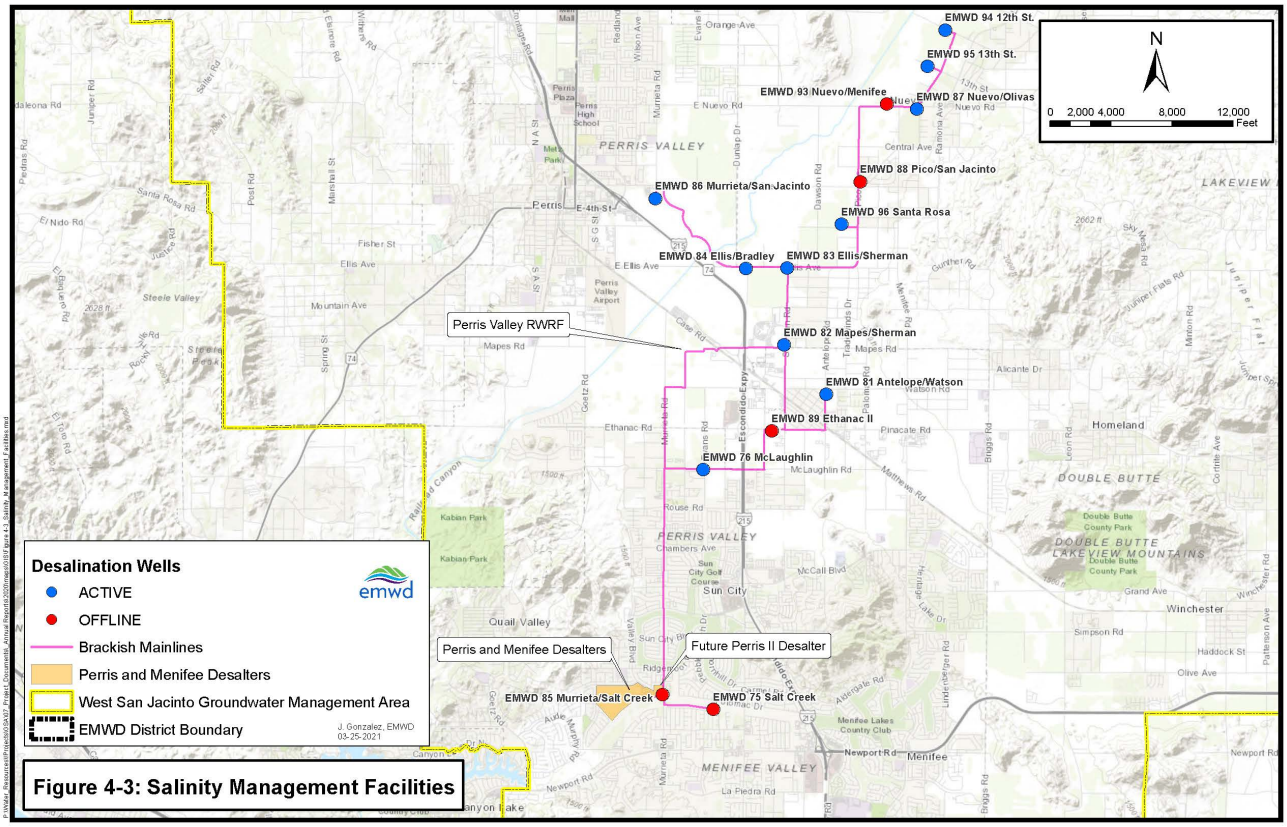
4.7.b Perris II Desalter

The proposed facility is a 5.4 MGD Reverse Osmosis (RO) Treatment Facility (TF) and brine pumping facilities. EMWD pursued Proposition I Grant Funding to construct the Perris II ROTF. EMWD received an award of $22.5M from the State Water Resources Control Board Department of Financial Assistance. Construction of the Perris II ROTF facilities are ongoing and the anticipated completion is August 2021.

4.7.c Iron and Manganese Removal Facilities

High iron and manganese concentrations have irreversibly impacted select desalter membranes, and have resulted in several brackish groundwater extraction wells remaining off-line. In 2004, an effort was initiated to evaluate alternative technologies for removal of iron and manganese prior to desalination. A removal process was selected and final design was completed in 2009. EMWD was awarded grant funding from the California Department of Public Health in the amount of $10M for construction of the facility. Construction was completed in 2013 and operation began in 2014, which has allowed EMWD to place Wells 75, 85, 88 and 89 back into active service. In 2020, wells 75, 85, and 89 were out of service and well rehabilitation is anticipated in the future. Wells 88 and 93 were also offline intermittently in 2020.

Figure 4-3: Salinity Management Facilities in the Management Area



4.8 Riverside County Well Information

Riverside County Ordinance No. 682.3 regulates the construction, reconstruction, abandonment, and destruction of wells. The Riverside County Department of Environmental Health is responsible for issuing well drilling permits. A valid permit along with the payment of all applicable fees is required before anyone digs, drills, bores, drives, or reconstructs a well that is, or was, a water well, a cathodic protection well, or a monitoring well. Standards for the construction or reconstruction of wells are the standards recommended in the California Department of Water Resources Bulletin No. 74-81, Chapter II, and Bulletin No. 74-90, as amended by the State.

Permits issued in 2020 are itemized in Table 4-10. It should be noted that the figures indicate the number of permits issued and does not necessarily reflect the actual number of wells drilled or abandoned, as permits may be issued but not used. EMWD initiated contact with the owners of these newly drilled agricultural wells in an effort to include them in the monitoring programs. EMWD also verifies destroyed wells and removes these wells from the monitoring programs. Well permits issued in the Management Plan area, by management zone and type of permit, for 2016 through 2020 are listed in Chapter 6, Table 6-9.

Table 4-10: 2020 Well Permits Issued in the Management Area

Management Zone	Domestic - Individual & Community Wells	Agricultural Wells	Monitoring Wells	Cathodic Protection Wells	Abandoned Wells	Well Evaluation or Other	Total Permits Issued
Lakeview	-	-	-	-	1	-	**1**
Perris North	5	2	-	4	1		**12**
Perris South	-	-	-	-	1	1	**2**
San Jacinto Lower Pressure	1	-	4	-	4	-	**9**
Menifee	-	-	-	-	-	-	**0**
Hemet South (partial)	-	-	-	-	-	-	**0**
Totals	**6**	**2**	**4**	**4**	**7**	**1**	**24**

4.9 Planned Development

EMWD maintains a database of proposed development projects within its service area. To assist in forecasting demand, projects can be separated into two categories (based on status): active construction and projected construction. Projects are in active construction once they have survey staking through completion. Proposed construction includes projects in planning and design, starting with agency review through active construction. One medium density single family residential unit is considered equivalent to one (1) Equivalent Dwelling Unit, which represents 0.49 acre feet per year of demand. The water demand shown is based on the number of residential units in each project and the acres of non-residential use. These demand projections are for planning purposes only and may change as information becomes available and projects are finalized.

Because of recent economic developments, completing a project in the Construction category could take up to nine years. Timing for completion of a project still in planning could be up to 25 years in the future. Time frames are approximate with multiple factors affecting development including economic patterns and/or environmental constraints.

A map of proposed projects categorized by status is shown in Chapter 7, Figure 7-10.

4.10 Water Rights

Issuance of water right permit 21403 (Application A031791) of EMWD to appropriate water from an unnamed subterranean stream tributary to the San Jacinto Groundwater Basin was granted on October 18, 2018. The water appropriated under this right shall be limited to the quantity which can be beneficially used and shall not exceed 2.9 cubic feet per second by direct diversion to be diverted from January 1 to December 31 of each year. The maximum amount diverted under this right shall not exceed 1,187 acre-feet per year.

Issuance of water right permit 21404 (Application A031799) of the City of Perris to appropriate water from an unnamed subterranean stream tributary to the San Jacinto Groundwater Basin was granted on October 18, 2018. The water appropriated under this right shall be limited to the quantity which can be beneficially used and shall not exceed 5.51 cubic feet per second by direct diversion to be diverted from January 1 to December 31 of each year. The maximum amount diverted under this right shall not exceed 462 acre-feet per year.

4.11 Status of Production Wells

Wellhead treatment of Perfluorinated compounds (PFAS) detected at Well 59 was completed in 2020 and Well 59 is online. EMWD has formally notified the USAF of the PFAS concern at Well 56. Well 56 is currently inactive (shut off).

5 ESTIMATED BUDGET

Table 5-1 contains the estimated budget to support the Management Plan activities for 2021. The total budget is estimated to be $330,080 and is provided by EMWD. Table 5-2 lists budgets and expected completion dates of additional activities undertaken by EMWD within or affecting the Management Area. Some of the items listed will be funded with grant monies.

Table 5-1: Calendar Year 2021 Estimated Budget

GROUNDWATER MANAGEMENT PLAN ACTIVITY	Estimated Annual Cost
Groundwater Extraction Monitoring	$ 19,610
Groundwater Level Monitoring Program	$ 16,320
Groundwater Quality Monitoring Program	$ 59.610
Inactive Well Capping/Sealing Program	$ 14,370
Meter Installation, Repair, and Maintenance Program	$ 21,440
Perris II Reverse Osmosis Treatment Facility Monitoring	$ 72,950
Data Management, Documentation, and Reporting	$ 95,090
Contingencies	$ 30,690
TOTAL YEAR 2021 ESTIMATED BUDGET	$ 300,080

Table 5-2: Current EMWD Projects within or Affecting the Management Area

PROJECT	Approximate Cost	Expected Completion Date
Perris North Basin Groundwater Contamination Prevention and Remediation Program	$ 45,000,000	February, 2023
Perris II Desalter	$ 48,800,000	Aug 2021
Brine Concentration Facility	$ 25,000,000	Dec 2028
Moreno Valley RWRF Expansion to 17 MGD	$ 47,000,000	Mar 2029
Perris Valley RWRF Expansion to 30 MGD	$ 147,000,000	Oct 2033
Perris Valley RWRF Expansion to 40 MGD	$ 132,600,000	Oct 2042
Perris Water Filtration Plant Expansion to 28 MGD	$ 25,000,000	Oct 2052
Perris Valley RWRF Expansion to 55 MGD	$ 99,700,000	Dec 2055
Total	**$ 570,100,000**	

6 TABLES OF MONITORING PROGRAM SUMMARIES AND TRENDS

Table 6-1: Prior Five Years of Results of the Groundwater Quality Monitoring Program in the Management Area

Management Zone	Year	No. of Wells	TDS (mg/L)		NO_3-N (mg/L)	
			Max	Min	Max	Min
Lakeview	2016	27	3,300	310	18.0	< 0.1
	2017	24	3,000	270	14.0	< 0.1
	2018	28	2,730	268	20.3	< 0.4
	2019	26	4,200	288	23	< 0.2
	2020	**26**	**3,000**	**239**	**19.6**	**< 0.2**
Perris North	2016	15	2,100	230	53.0	< 0.1
	2017	12	1,900	330	20.0	< 0.1
	2018	17	2,160	352	42.6	< 0.4
	2019	14	1,970	328	40	0.23
	2020	**10**	**1,650**	**394**	**25.1**	**< 0.4**
Perris South	2016	37	13,000	390	35.0	< 0.1
	2017	45	12,000	420	27.0	< 0.1
	2018	45	11,700	446	12	< 0.4
	2019	47	28,000	560	13	< 0.2
	2020	**49**	**16,900**	**390**	**20.6**	**< 0.2**
San Jacinto Lower Pressure	2016	6	3,100	350	8.0	< 0.1
	2017	4	1,600	350	8.1	< 0.1
	2018	6	920	384	9.4	< 0.4
	2019	3	1,000	360	8.2	< 0.2
	2020	**3**	**1,810**	**376**	**10.2**	**< 0.4**
Menifee	2016	6	2,300	890	9.8	2.0
	2017	2	1,200	150	4.0	< 0.1
	2018	5	2,950	900	8.5	0.7
	2019	6	2,800	930	8.5	3.7
	2020	**5**	**3,180**	**860**	**2.9**	**8.8**
Hemet South (partial)	2016	4	720	510	16.0	11.0
	2017	2	550	590	12.0	12.0
	2018	4	918	700	26.7	19.0
	2019	2	1,100	950	31	31
	2020	**2**	**702**	**652**	**14.2**	**13**

Note: The same wells were not necessarily sampled each year, which may cause fluctuations in high and low values. It should also be noted that water quality and the character of groundwater are determined by a number of factors including: mineral content of sediments; recharge and drainage patterns; historic land use practices; and screening intervals and depths of wells sampled, to name a few.

Table 6-2: Historical Results of the Groundwater Level Monitoring Program in the Management Area

Number of Wells Measured														
Management Zone	Lakeview		Perris North		Perris South		San Jacinto Lower Pressure		Menifee		Hemet South (partial)		Totals	
Year	Spr.	Fall	Spr.	Fall	Spr.	Fall	Spr.	Fall	Spr.	Fall	Spr.	Fall	Spr.	Fall
2016	24	27	26	24	55	56	21	19	15	15	4	4	145	145
2017	28	29	25	24	60	60	21	21	13	11	4	3	151	148
2018	27	25	25	27	59	59	21	21	13	12	4	3	149	147
2019	23	23	24	23	55	54	18	14	12	11	4	3	136	128
2020	**24**	**25**	**25**	**22**	**58**	**54**	**14**	**20**	**13**	**12**	**4**	**2**	**138**	**135**
Maximum and Minimum Depth To Water (feet)														
Management Zone	Lakeview		Perris North		Perris South		San Jacinto Lower Pressure		Menifee		Hemet South (partial)		Totals	
Year	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
2016	87.5	234.2	14.2	206.7	4.6	90.9	22.1	259.1	81.2	126.9	61.1	90.3	4.6	259.1
2017	89.7	232.4	11.1	186.4	1.7	193.0	13.1	257.6	79.1	127.2	55.6	63.4	1.7	257.6
2018	89.4	229.1	14.5	180.0	2.9	202.8	18.5	255.8	76.9	115.3	51.2	58.5	2.9	255.8
2019	93.0	224.6	14.4	85.4	1.8	91	65.6	252.4	72.9	109	47.6	56.9	1.8	252.4
2020	**90.5**	**223.5**	**10.3**	**85.3**	**3.1**	**97**	**66.4**	**252.2**	**68.7**	**102.1**	**45.1**	**54.4**	**3.1**	**252.2**

Note: The above figures represent the number of wells actually sampled or measured rather than the number of wells participating in the program. Not all participating wells could be sampled or measured each year due to flooding, access, or other constraints.

Table 6-3: Historical Results of the Wells Monitored for Groundwater Extraction in the Management Area

Year	Method of Determining Groundwater Extraction			
	Number of Meters Read by EMWD	Number of Meters Read by Other Agencies & Reported to EMWD	Number of Wells with Extraction Estimated by EMWD	Total Wells
2016	38	4	14	56
2017	38	4	14	56
2018	39	4	14	57
2019	40	4	14	58
2020	**43**	**4**	**12**	**59**

Table 6-4: Historical Results of the Groundwater Extraction Monitoring Program in the Management Area

Management Zone / Year	Groundwater Extraction (AF)						
	Lakeview	Perris North	Perris South	San Jacinto Lower Pressure	Menifee	Hemet South (partial)	Total
2016	5,572	5,466	7,813	1,301	4,024	265	24,441
2017	5,562	3,941	6,890	1,090	4,244	112	21,839
2018	5,398	4,406	6,765	1,088	4,155	1	21,813
2019	5,143	2,347	7,687	651	3,894	4	19,726
2020	**3,620**	**3,358**	**8,221**	**179**	**4,457**	**23**	**19,858**

Table 6-5: Historical Results of the San Jacinto Watershed Groundwater Recordation Program in the Management Area

Management Zone / Year	Groundwater Extraction (AF)						
	Lakeview	Perris North	Perris South	San Jacinto Lower Pressure	Menifee	Hemet South (partial)	Total
2015	2,951	5,668	9,445	271	1,825	350	20,510
2016	2,438	5,066	7,628	550	3,038	272	18,992
2017	1,966	2,908	6,735	540	3,179	120	15,448
2018	1,621	4,006	5,884	538	9,558	8	21,615
2019	**3,888**	**1,323**	**7,502**	**251**	**4,297**	**0**	**17,260**

Table 6-6: Historical Results of the Recycled Water Monitoring in the Management Area

Management Zone / Year	Recycled Water Use (AF)						
	Lakeview	Perris North	Perris South	San Jacinto Lower Pressure	Menifee	Hemet South (partial)	Total
2016	3,880	1,164	5,354	7,584	662	405	19,049
2017	2,858	1,218	4,818	7,866	1,178	305	18,243
2018	3,402	1,311	4,109	8,133	950	289	18,194
2019	3,489	1,296	3,573	6,694	592	249	15,893
2020	**4,696**	**1,028**	**3,723**	**5,953**	**779**	**262**	**16,441**

Table 6-7: Historical Results of the Precipitation Monitoring Program in the Management Area

Precipitation (inches)					
Station	**Lakeview***	**Lake Perris**	**Moreno Valley East***	**Sun City**	**Winchester**
Long-term Average	1910-2012	1989-2020	2001-2020	1989-2020	1989-2020
	11.65	9.43	11.45	10.33	10.28
2016	-	8.01	11.26	8.46	8.89
2017	-	6.90	8.91	8.42	7.76
2018	-	5.61	8.63	6.34	6.78
2019	-	14.07	16.59	15.20	15.18
2020	**-**	**9.41**	**9.74**	**9.57**	**10.58**

*Data does not represent 31-year mean precipitation for long-term average

Table 6-8: Historical Results of the Inactive Well Capping/Sealing Program in the Management Area

Management Zone / Year	Inactive Well Capping/Sealing						
	Lakeview	**Perris North**	**Perris South**	**San Jacinto Lower Pressure**	**Menifee**	**Hemet South (partial)**	**Totals**
2016	0	0	0	0	0	0	0
2017	1	0	0	0	0	0	1
2018	1	0	0	0	0	0	1
2019	2	0	0	0	0	0	2
2020	0	1	6	1	0	0	8
2000-2020	**11**	**10**	**32**	**11**	**11**	**0**	**75**

Table 6-9: Historical Results of the County Well Permits in the Management Area

Permit Type / Year	Well Permits in the Management Area by Type and Year						
	Domestic/ Individual Community Wells	Agricultural Wells	Monitoring Wells	Cathodic Protection Wells	Well Abandonment	Well Evaluation or Other	Totals
2016	4	2	18	1	139	0	164
2017	4	0	19	2	35	0	60
2018	6	1	62	4	1	0	74
2019	2	4	11	4	7	2	30
2020	**6**	**2**	**4**	**4**	**7**	**1**	**24**

Table 6-10: 2020 Monthly Groundwater Production in the Management Area

Month	Box Springs	EMWD	NWC	City of Perris Water	Private	Total
January	8	846	28	41	173	**1,095**
February	6	682	28	47	170	**933**
March	12	894	34	37	278	**1,256**
April	20	1,154	31	41	410	**1,656**
May	27	1,287	66	66	616	**2,062**
June	35	974	61	57	761	**1,888**
July	39	1,183	84	77	912	**2,294**
August	33	1,233	74	81	934	**2,355**
September	27	1,053	83	74	768	**2,005**
October	27	1,027	49	68	672	**1,842**
November	15	903	40	54	353	**1,364**
December	10	731	38	54	275	**1,107**
Total	**260**	**11,967**	**614**	**696**	**6,321**	**19,858**

Note: Monthly groundwater production rounded to the nearest whole number.

7 FIGURES AND MAPS

CALIFORNIA

N
W
E
S

RIVERSIDE COUNTY

EMWD

Groundwater Management Area

Legend

- Santa Ana/Santa Margarita Watershed Boundary
- West San Jacinto Groundwater Management Area
- EMWD Boundary

0 1 2 4 Miles

N

emwd EASTERN MUNICIPAL WATER DISTRICT

I-215
U. S. HIGHWAY 60
U.S. HWY 60
I-10
HWY 79
HWY 74
I-15
CNTY RD S3

City of Moreno Valley
Perris North
San Jacinto Lower Pressure
Mount Russell Range
Lake Perris
Bernasconi Hills
San Jacinto Upper Pressure
Lakeview
City of Perris
Lakeview Mountains
Hemet North
Perris South
Double Butte
Hemet South
Hemet South (Partial)
City of Menifee
Menifee
Diamond Valley Lake

Figure 7-1: Location Map of the Management Area

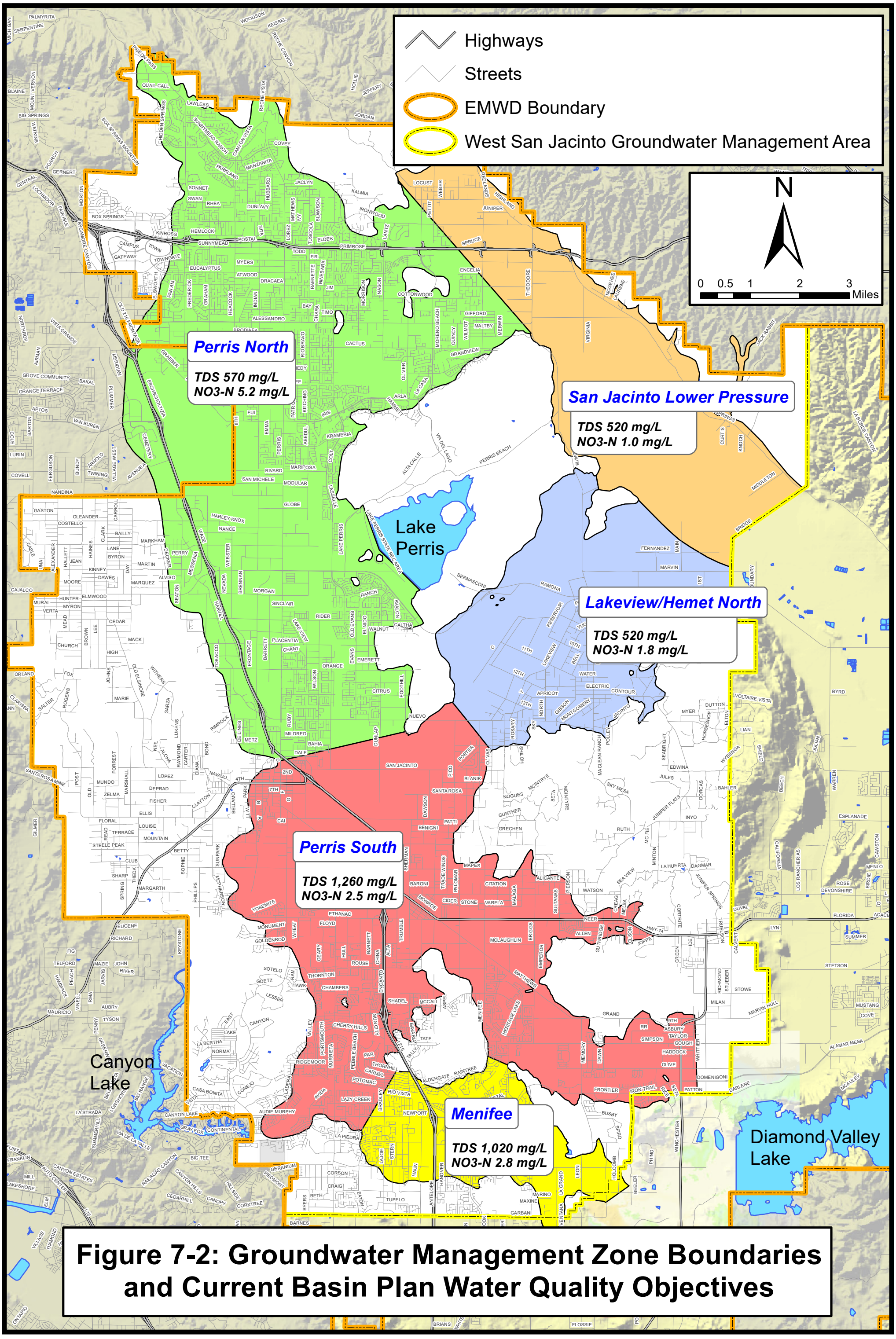


Figure 7-2: Groundwater Management Zone Boundaries and Current Basin Plan Water Quality Objectives

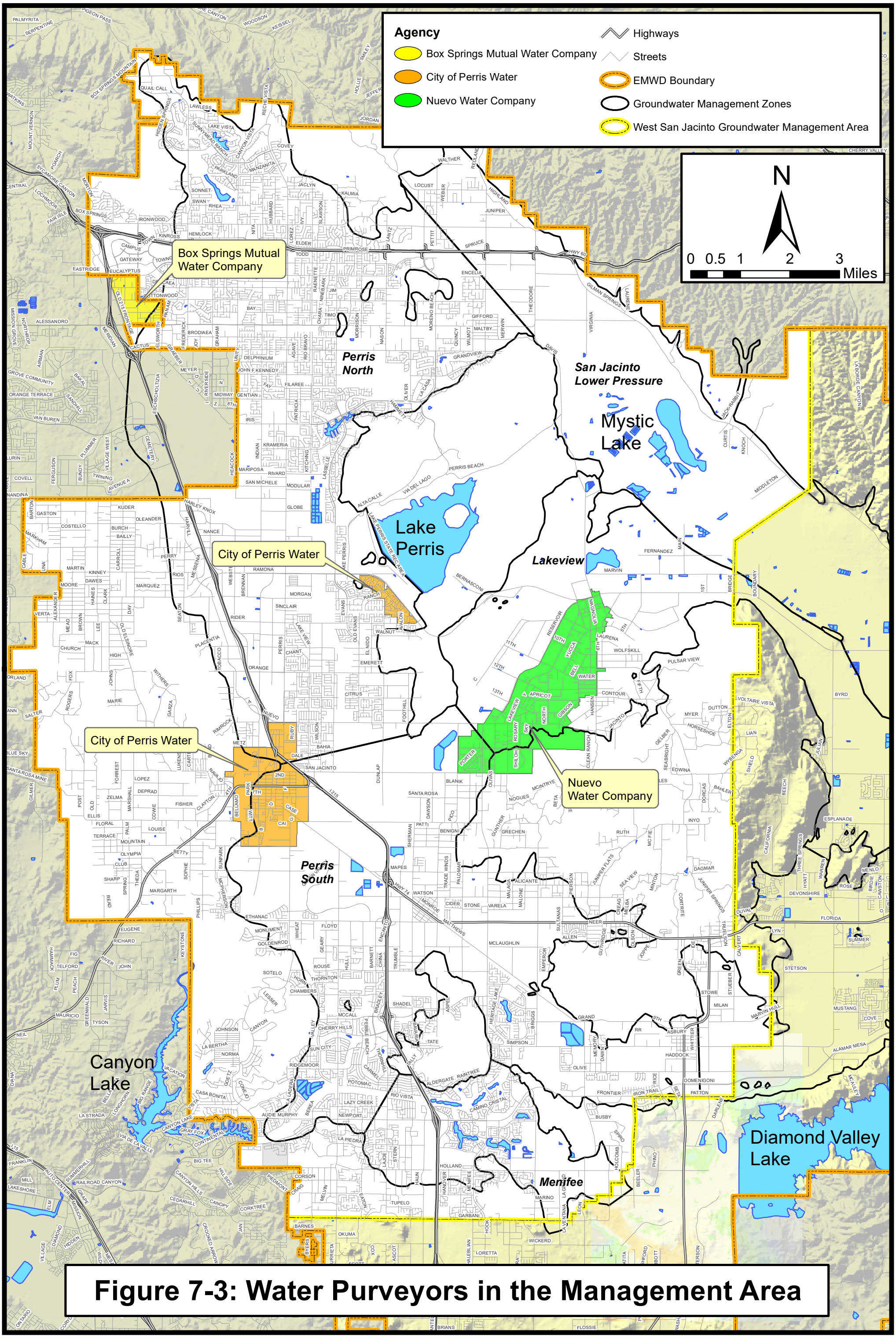


Figure 7-3: Water Purveyors in the Management Area

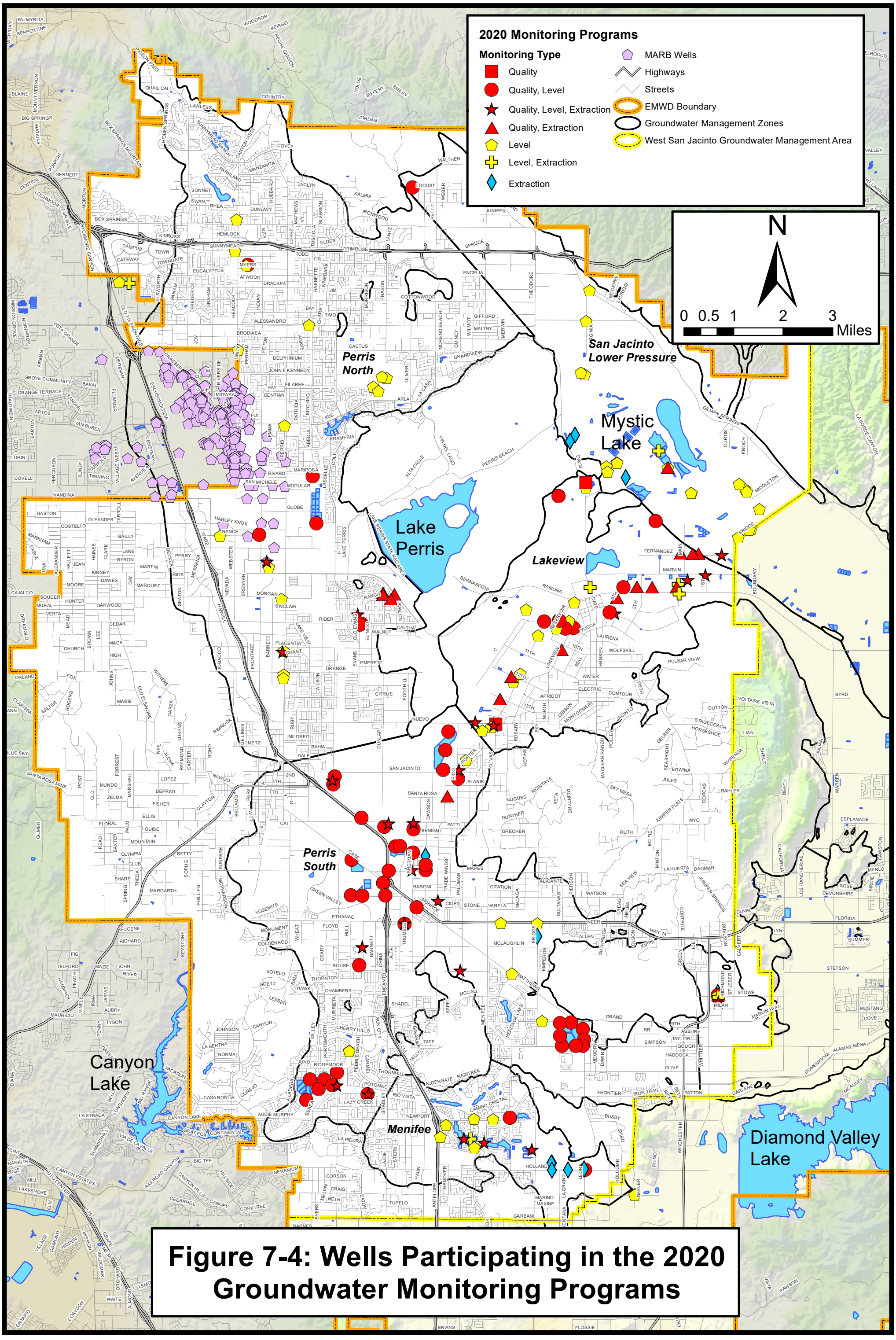


Figure 7-4: Wells Participating in the 2020 Groundwater Monitoring Programs

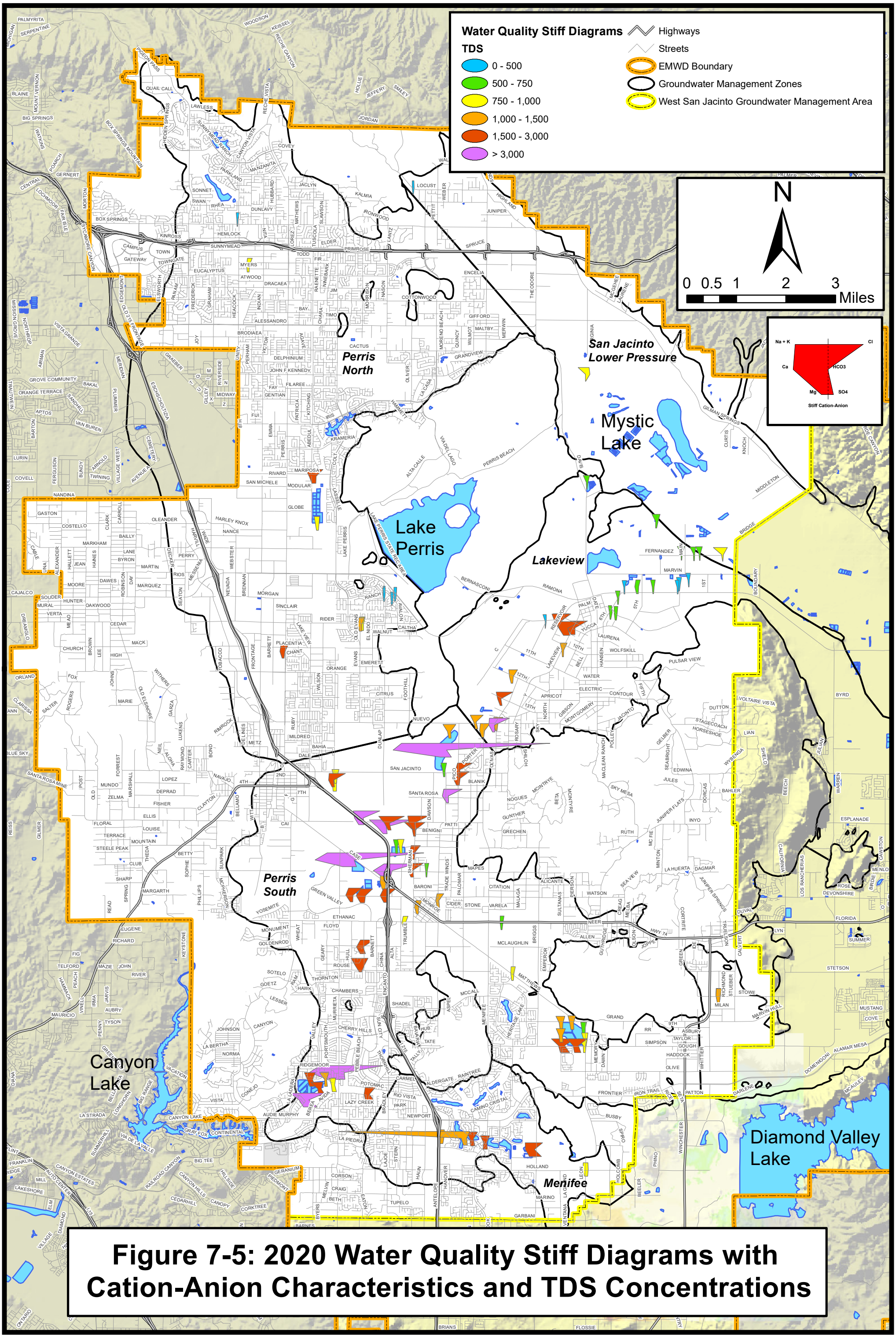


Figure 7-5: 2020 Water Quality Stiff Diagrams with Cation-Anion Characteristics and TDS Concentrations

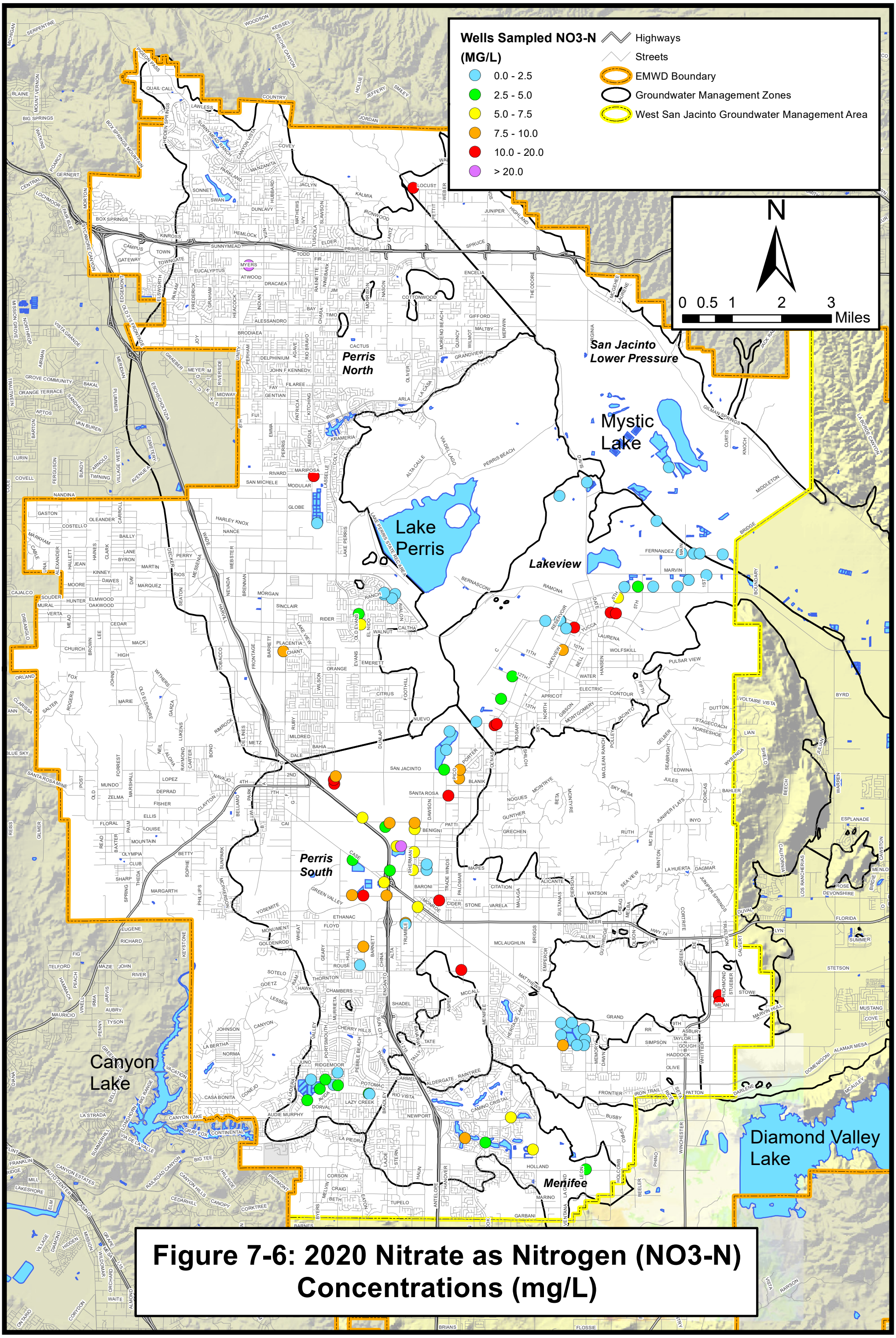


Figure 7-6: 2020 Nitrate as Nitrogen (NO3-N) Concentrations (mg/L)

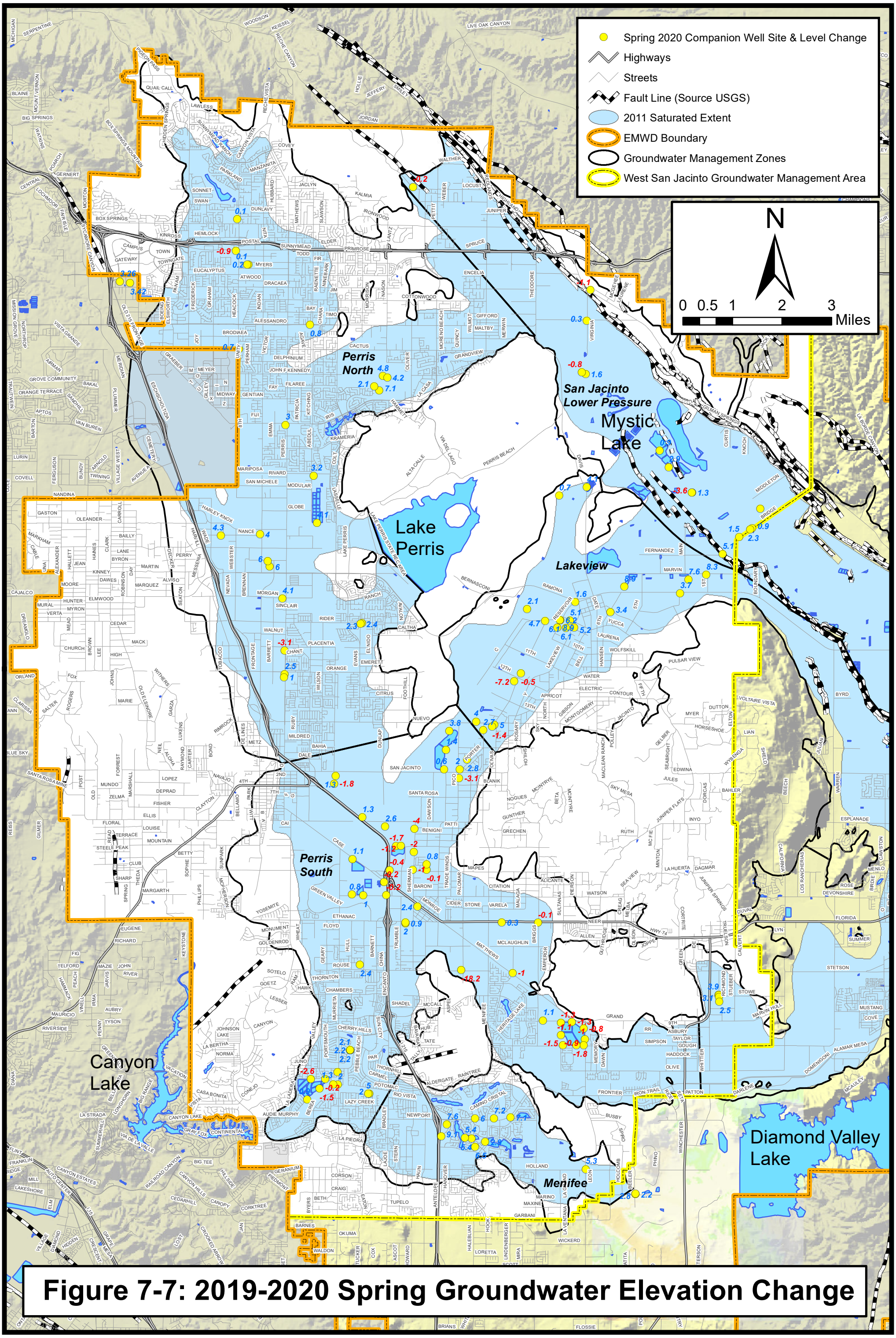


Figure 7-7: 2019-2020 Spring Groundwater Elevation Change

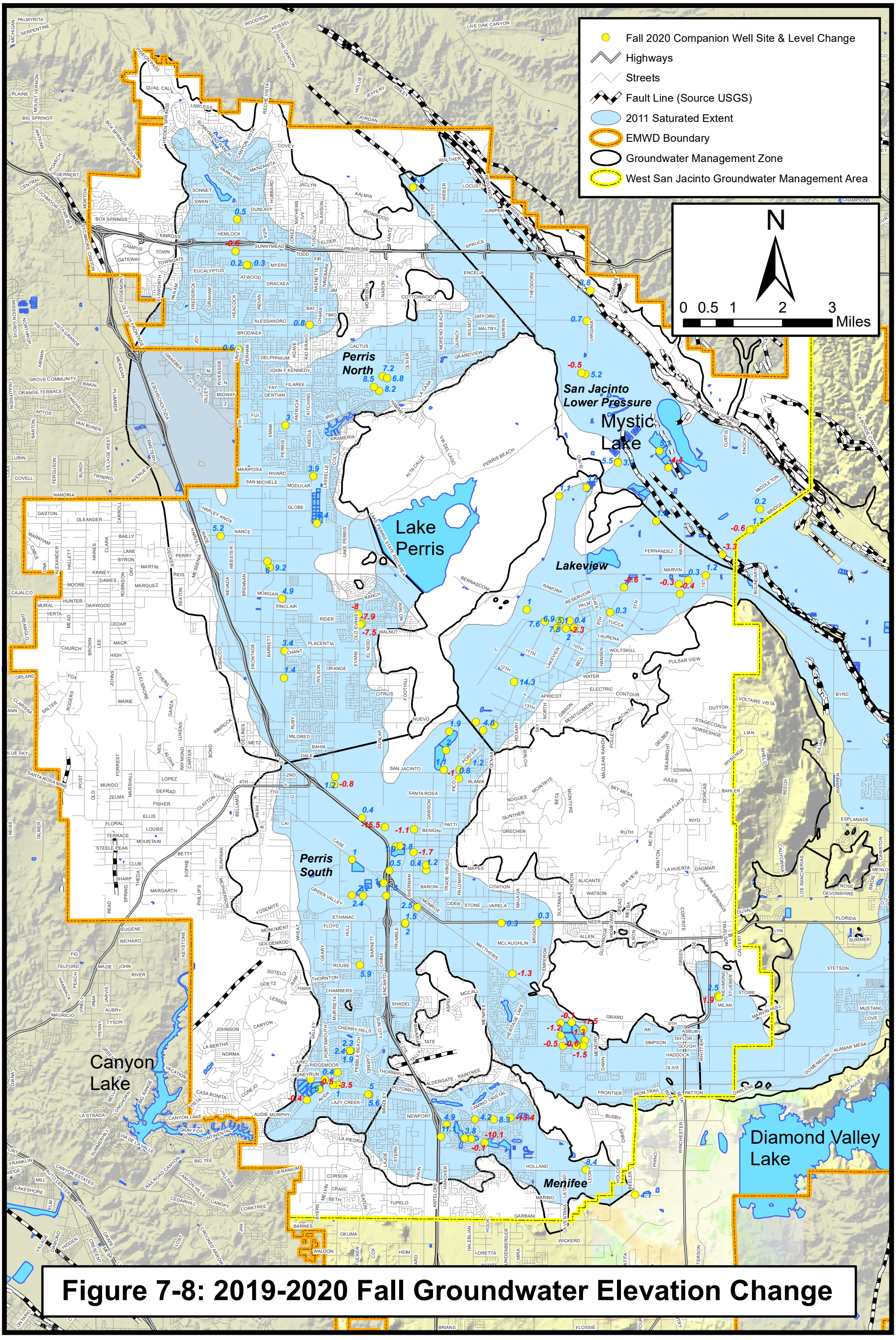


Figure 7-8: 2019-2020 Fall Groundwater Elevation Change

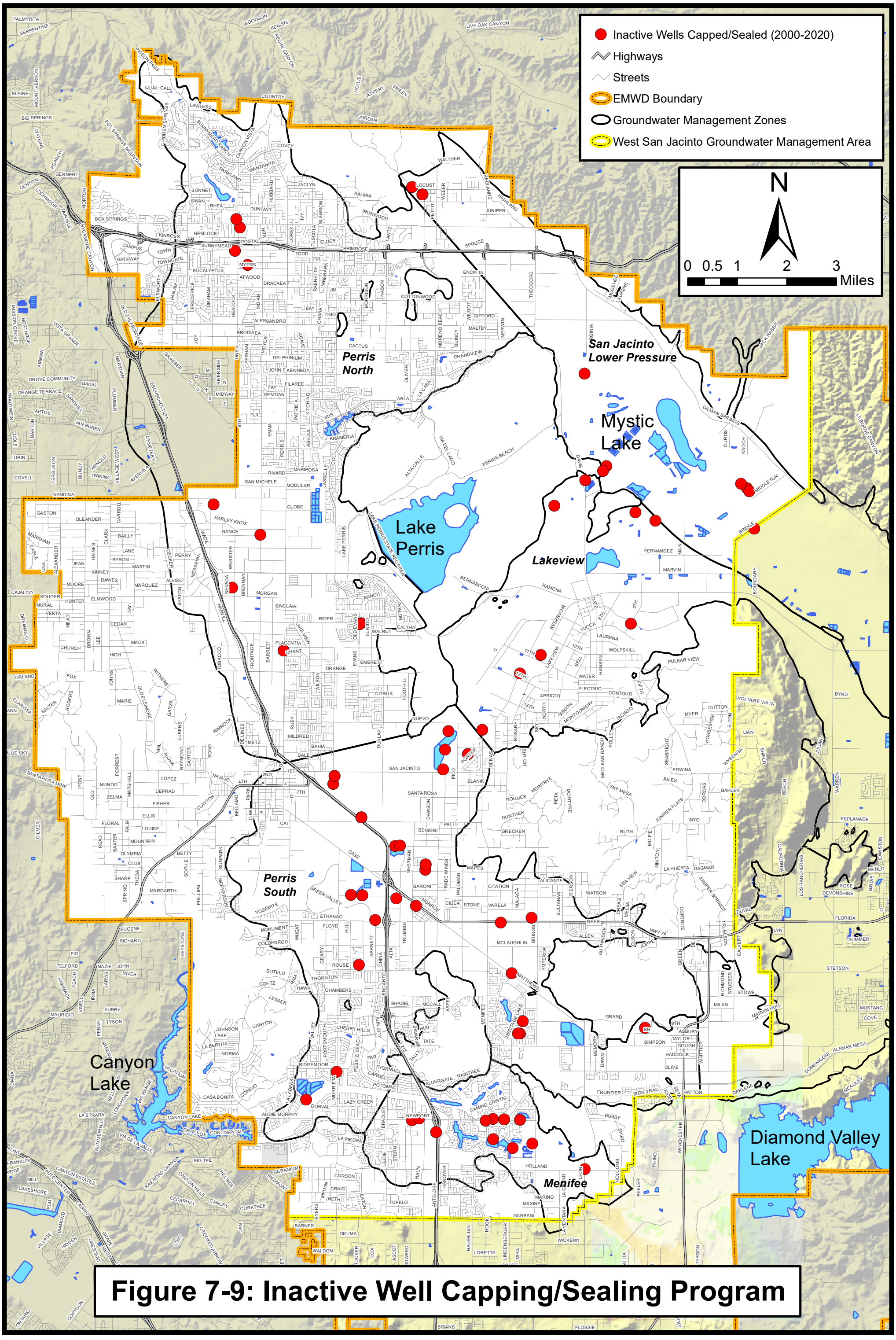


Figure 7-9: Inactive Well Capping/Sealing Program

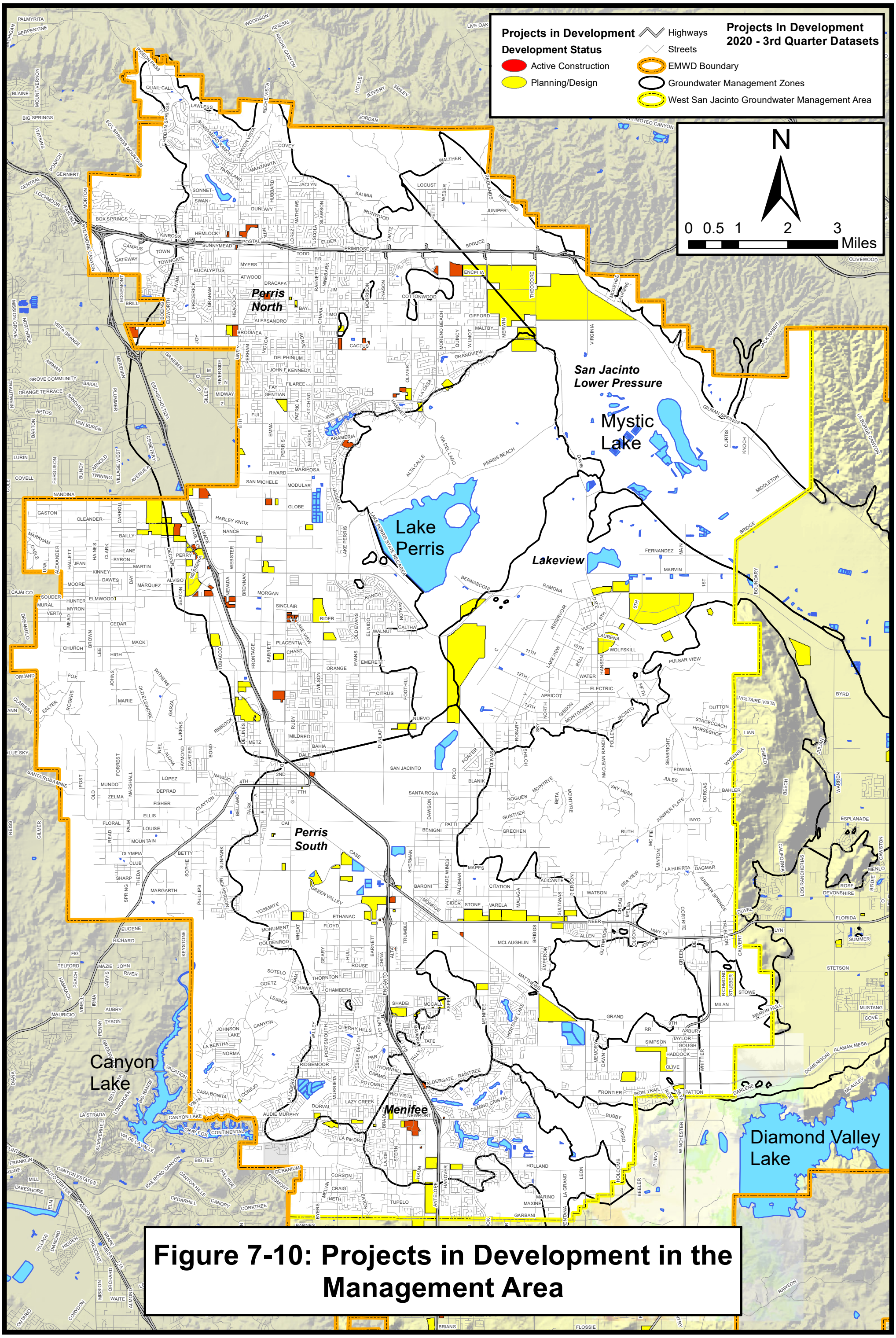


Figure 7-10: Projects in Development in the Management Area

8 APPENDICES

8.1 Stakeholder Advisory Group Meeting Presentations

West San Jacinto Groundwater Sustainability Agency (GSA) Development of the West San Jacinto Groundwater Sustainability Plan (GSP) – January 14, 2019

Rachel Gray

January 14, 2019

Introduction

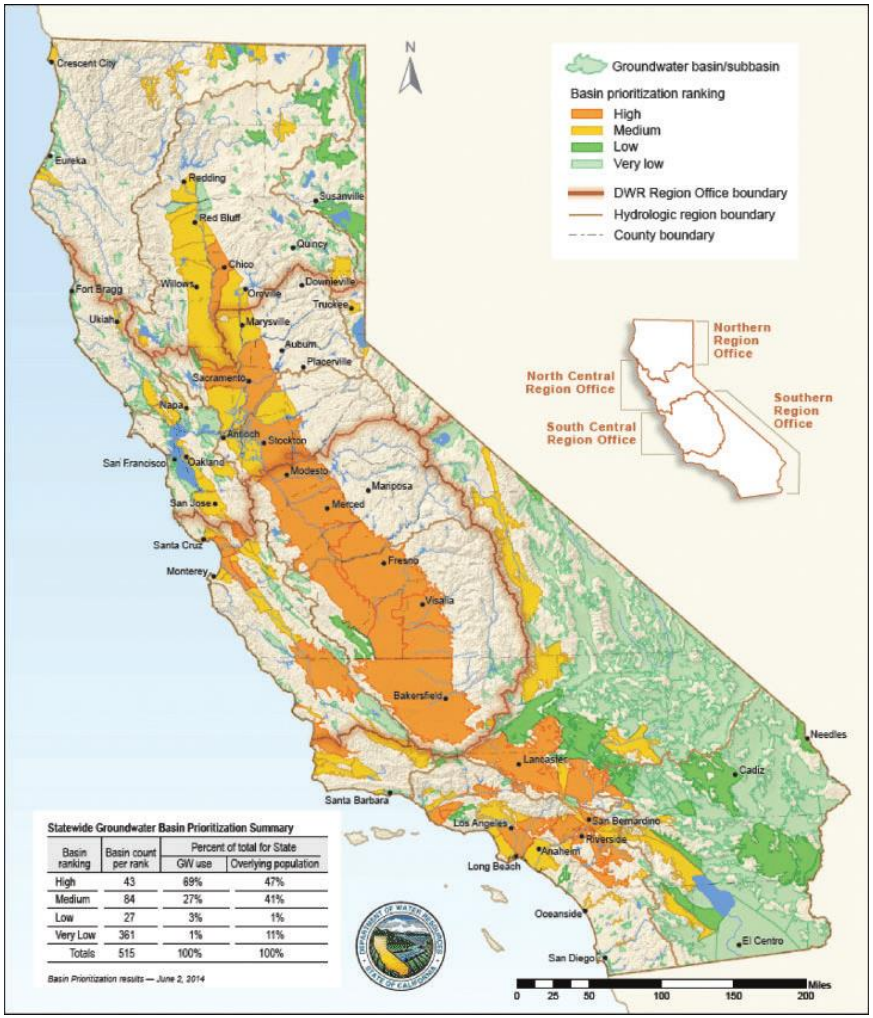
- Project Overview
  - What is the Sustainable Groundwater Management Act?
  - What is a Groundwater Sustainability Plan?
- Update on the Groundwater Sustainability Plan Development
  - Hydrogeologic Conceptual Model
  - Historical and Current Water Budgets
  - Timeline and Next Steps
- SGMA Webpage
- Feedback
- Questions and Answers

Project Overview

What is the Sustainable Groundwater Management Act?

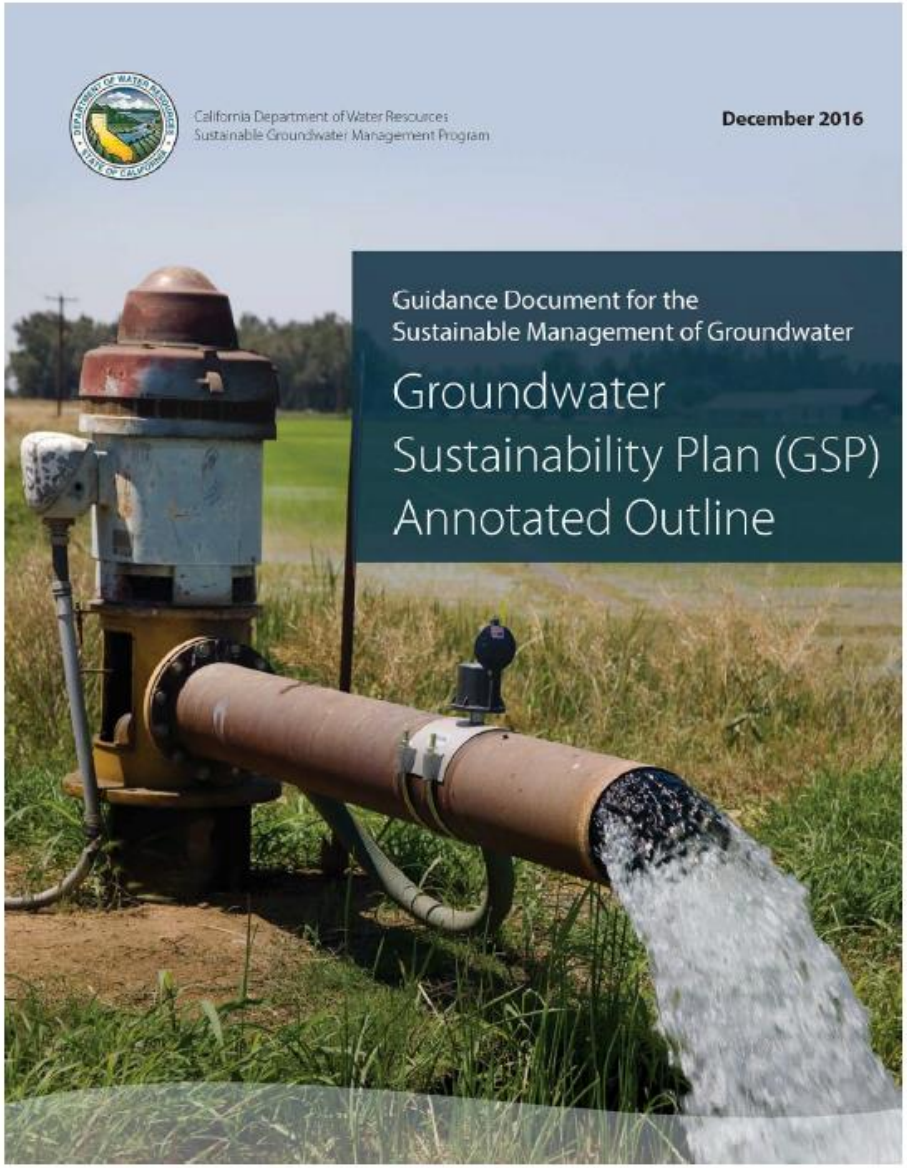
- Signed September 16, 2014
- Effective January 1, 2015
- Requires:
  - Formation of groundwater sustainability agencies (GSAs) for high and medium priority groundwater basins
  - Preparation of groundwater sustainability plans (GSPs) by 2022
  - Achieve sustainability within 20 years of plan adoption
- "A central tenet of these bills is the recognition that groundwater management is best accomplished locally."

  – Governor Edmund G. Brown Jr.

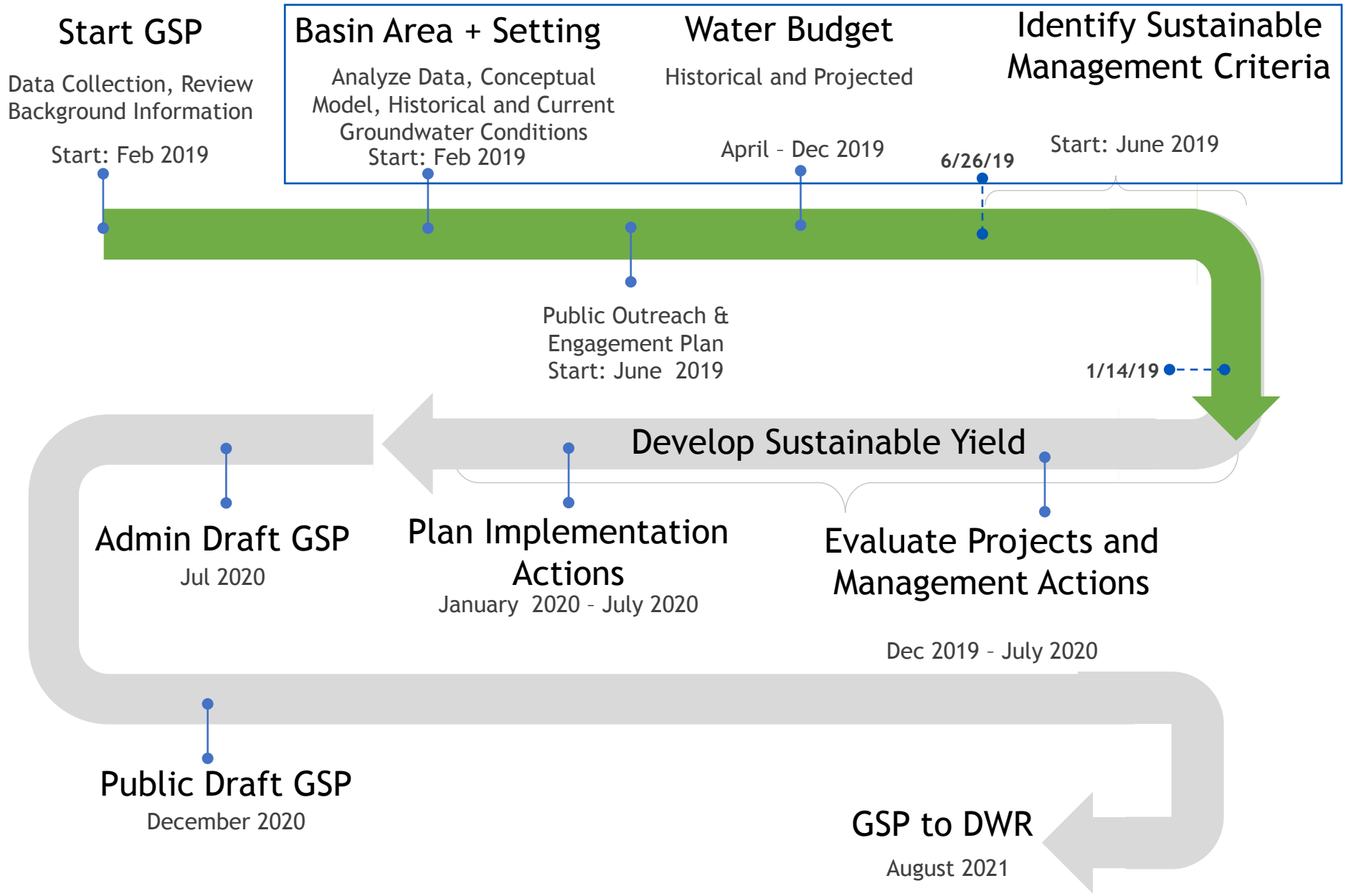


What is a Groundwater Sustainability Plan?

- Technical and planning document that includes
  - Hydrogeological understanding of the basin
    - Geologic setting
    - Aquifer location, thickness, and depth to groundwater
    - Sources of water
    - Uses of water
  - Predictions of future groundwater use and conditions in the basin
  - Criteria by which the basin will be managed sustainably by 2042
    - Based on 6 sustainability indicators



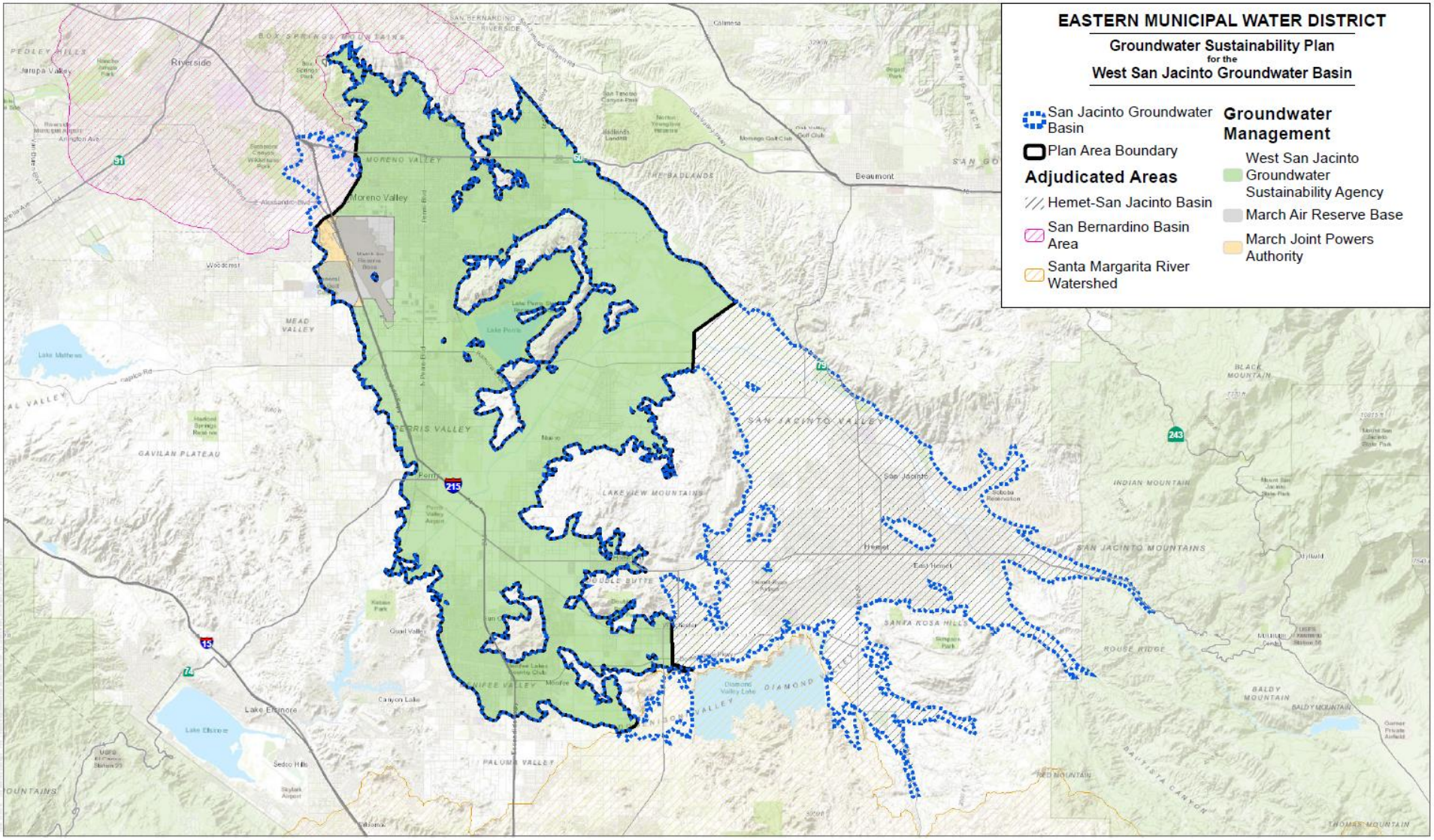
GSP Development Process Update



Update on the Groundwater Sustainability Plan Development

emwd EASTERN MUNICIPAL WATER DISTRICT

West San Jacinto Groundwater Basin (WSJGB)



West San Jacinto Groundwater Basin (WSJGB)

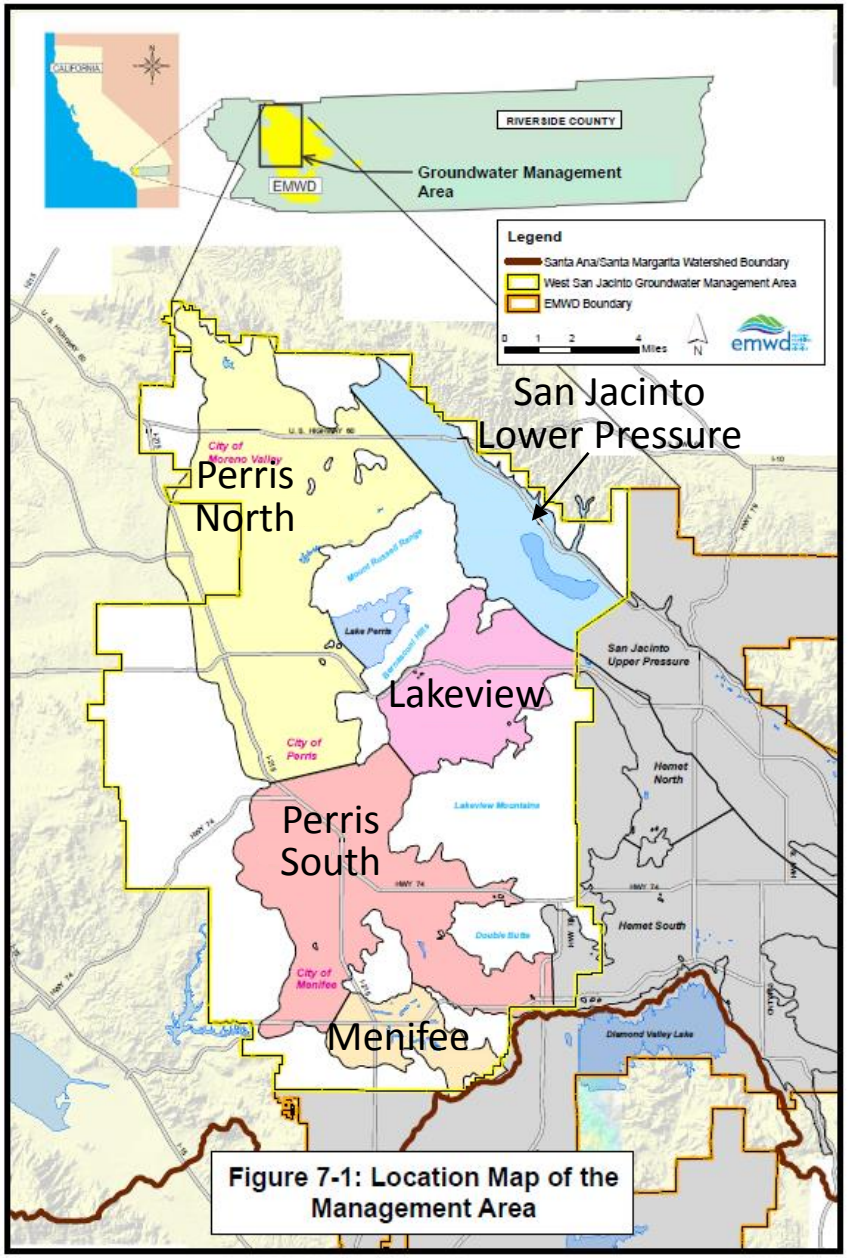
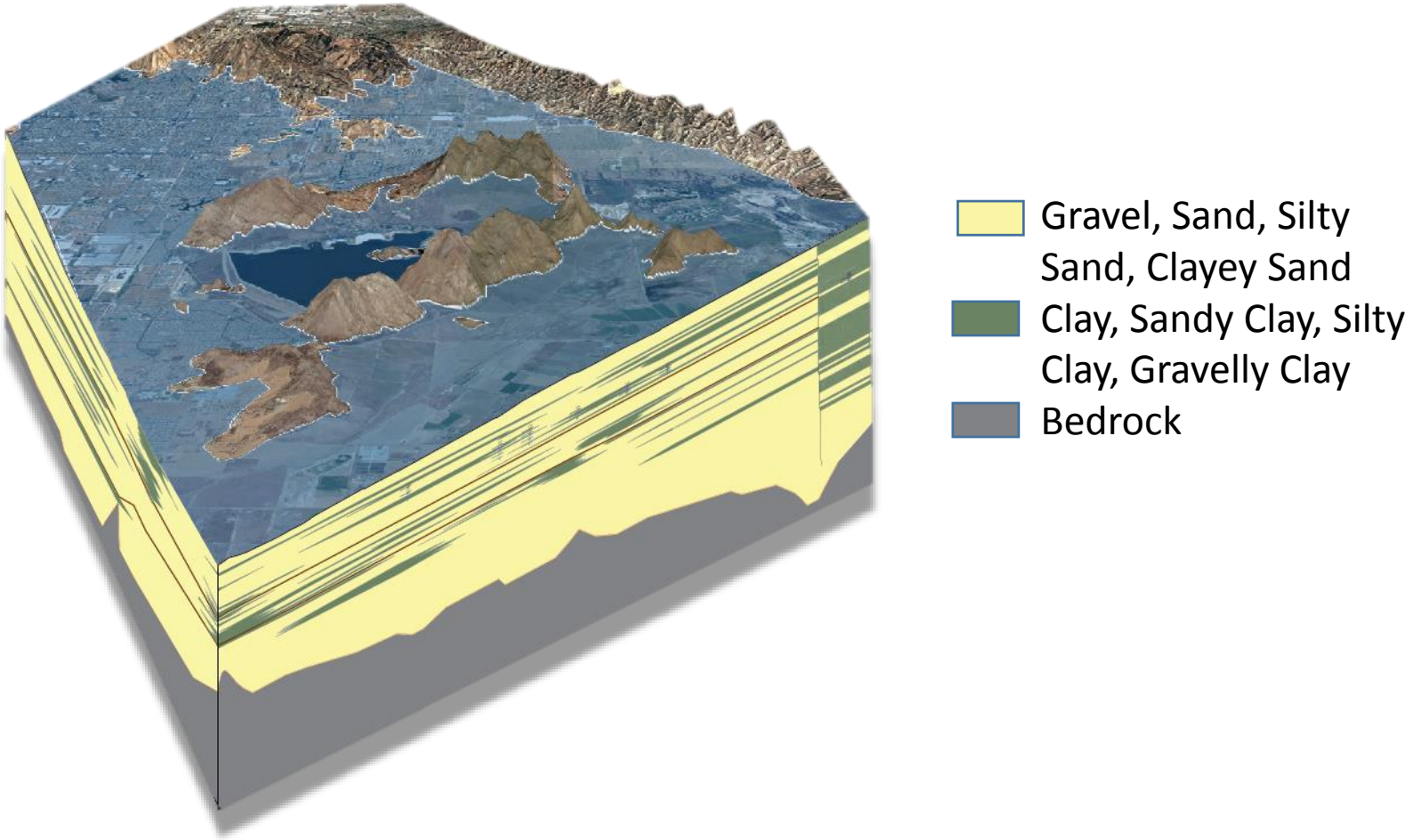


Figure 7-1: Location Map of the Management Area

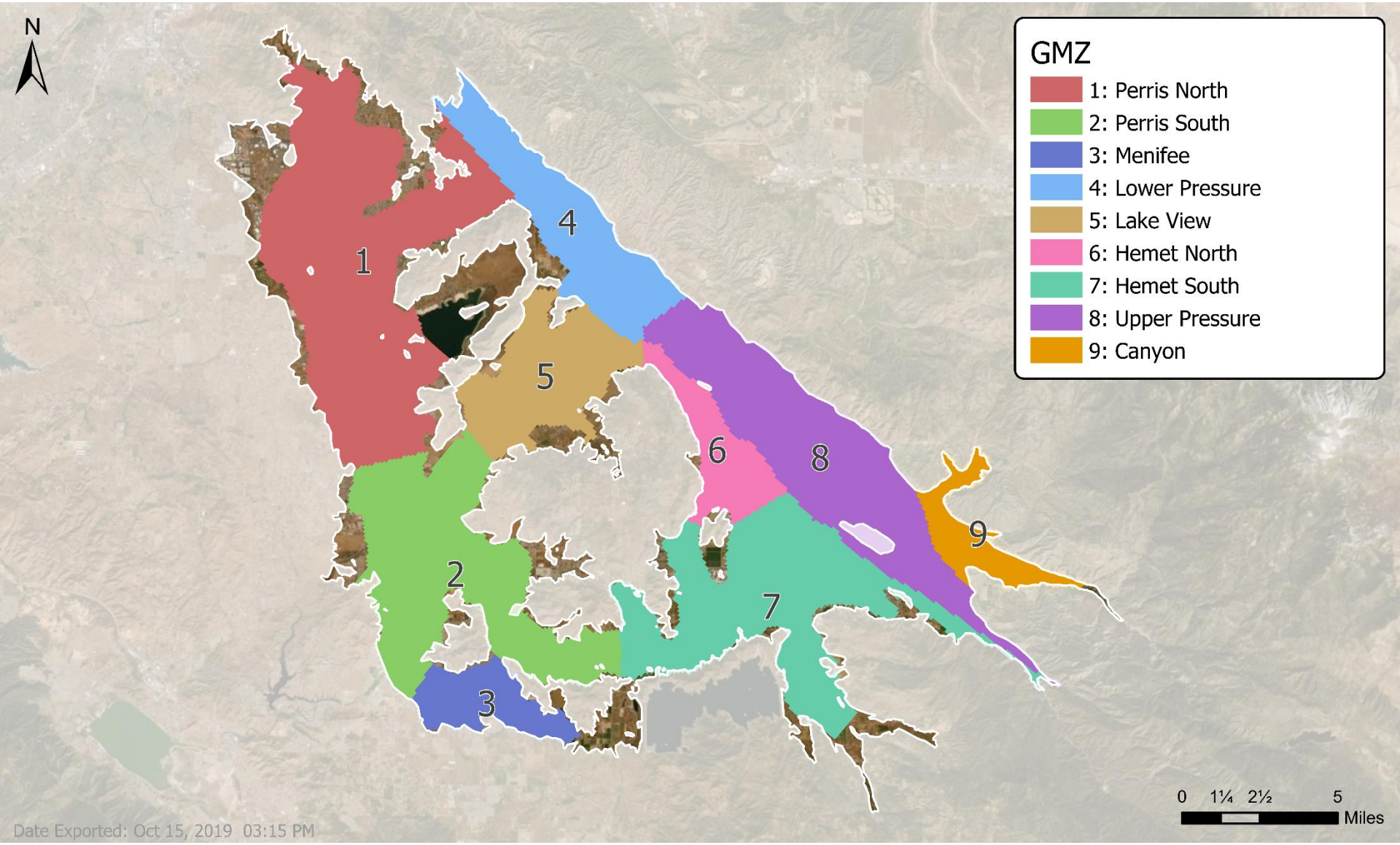
- Managed under a groundwater management plan (GMP) since 1995
- 5 groundwater management zones:
  - Perris North
  - Perris South
  - Menifee
  - San Jacinto Lower Pressure
  - Lakeview

Hydrogeologic Conceptual Model

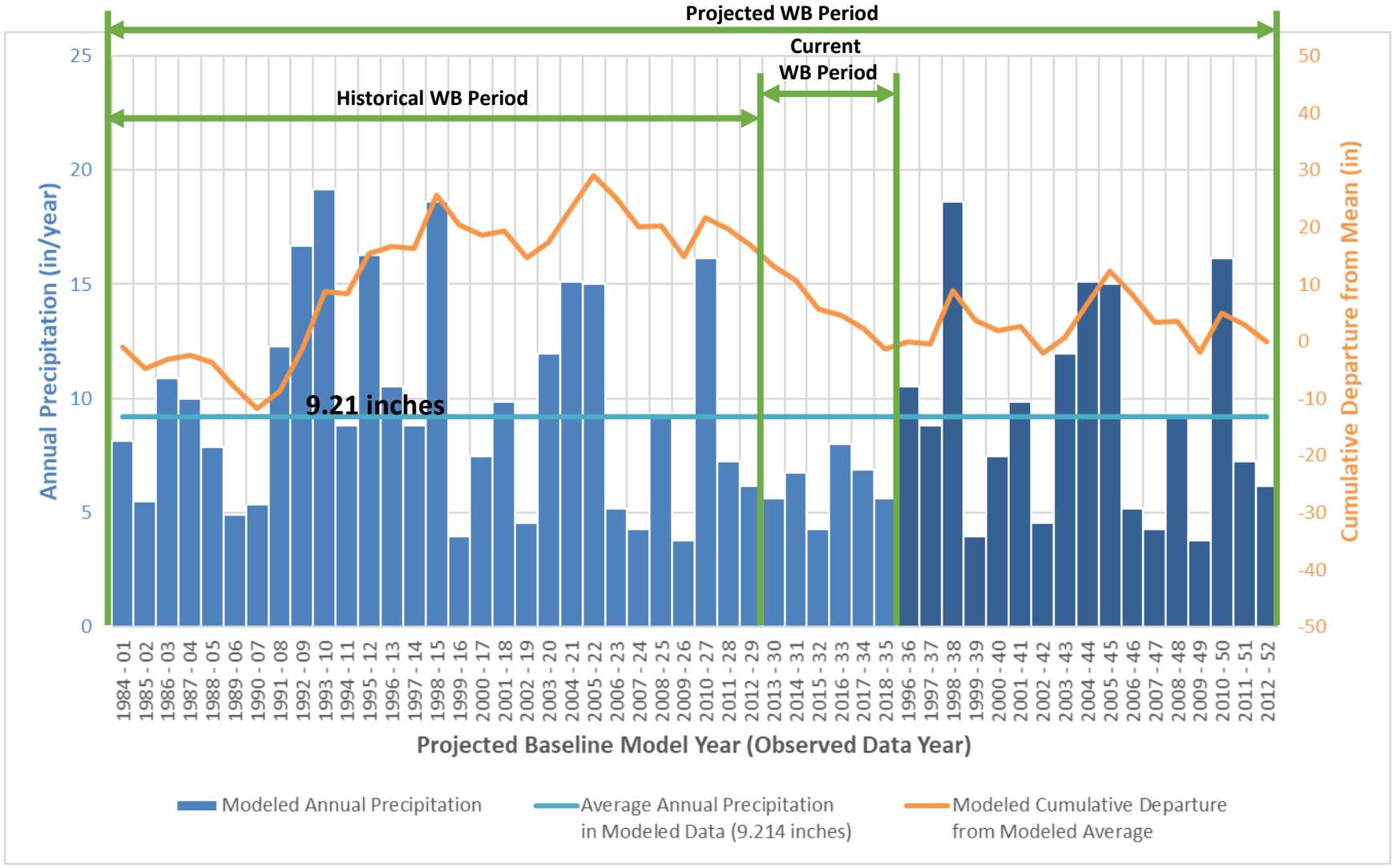
- Provides an understanding of the general physical characteristics related to regional hydrology, land use, geology and geologic structure, water quality, aquifers, and aquitards



Basin Boundary Adjustments in the Model

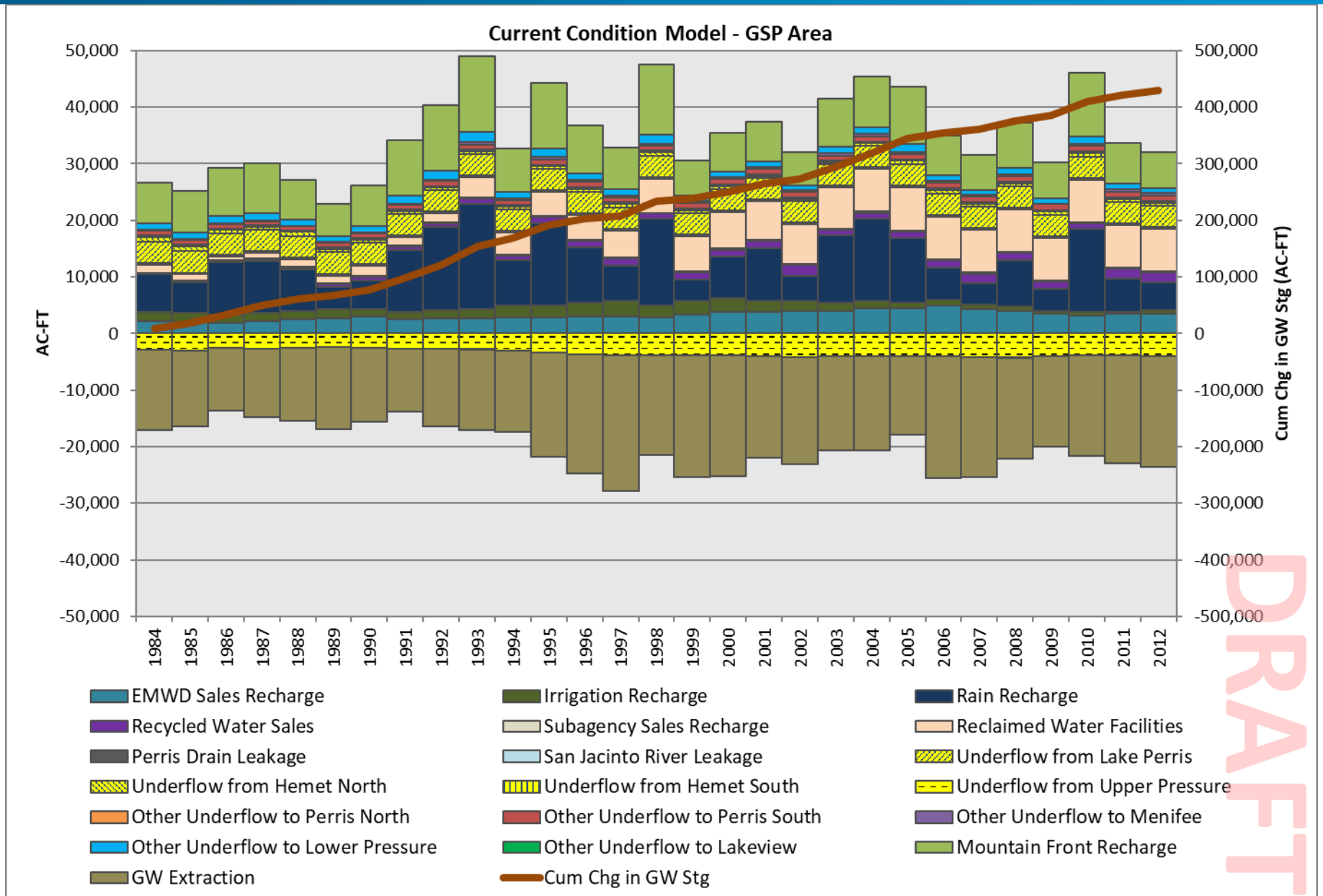


Model Hydrologic Periods



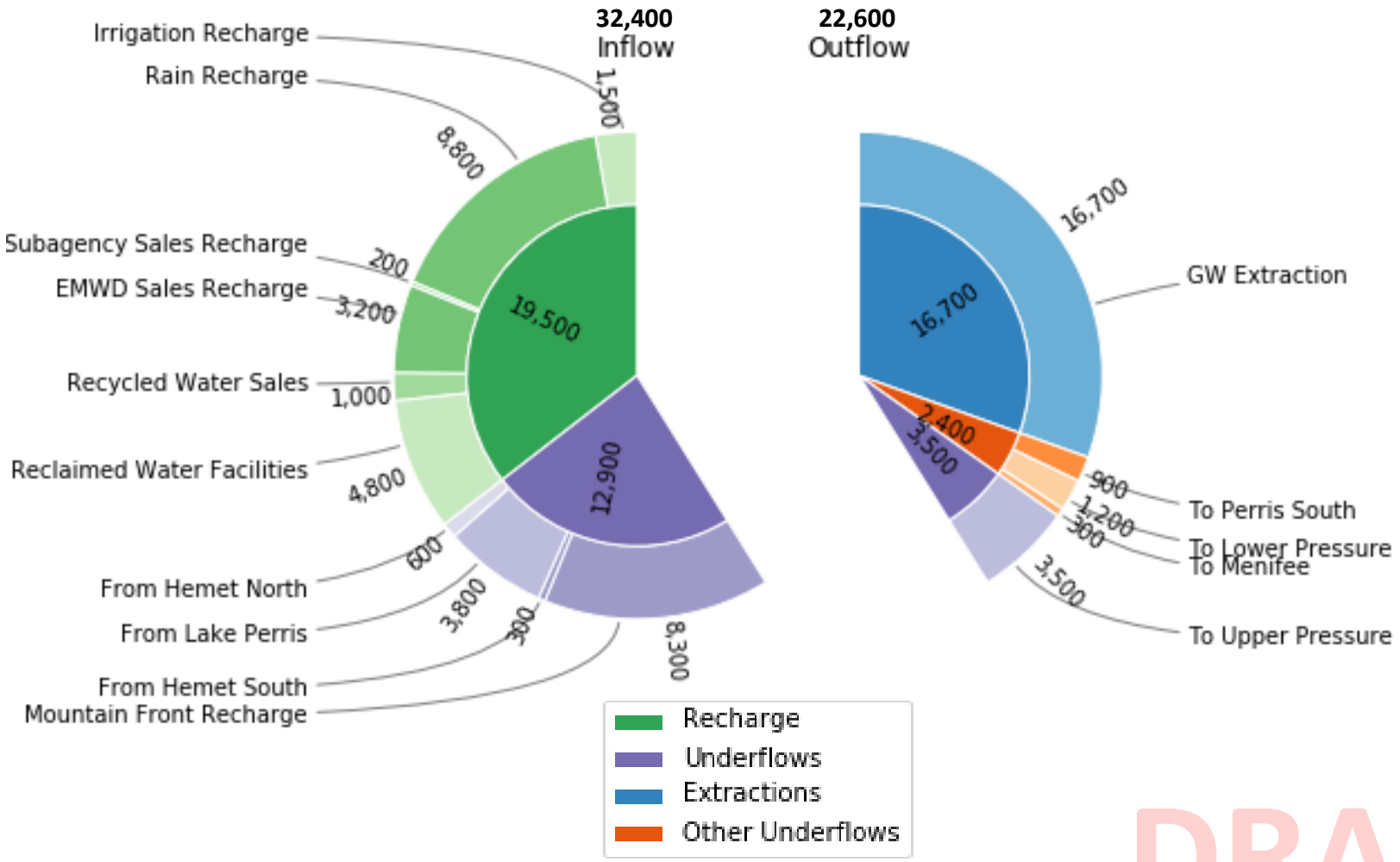
Data Based on Lake Perris Rainfall Gauge

Historical Water Budget – GSP Area

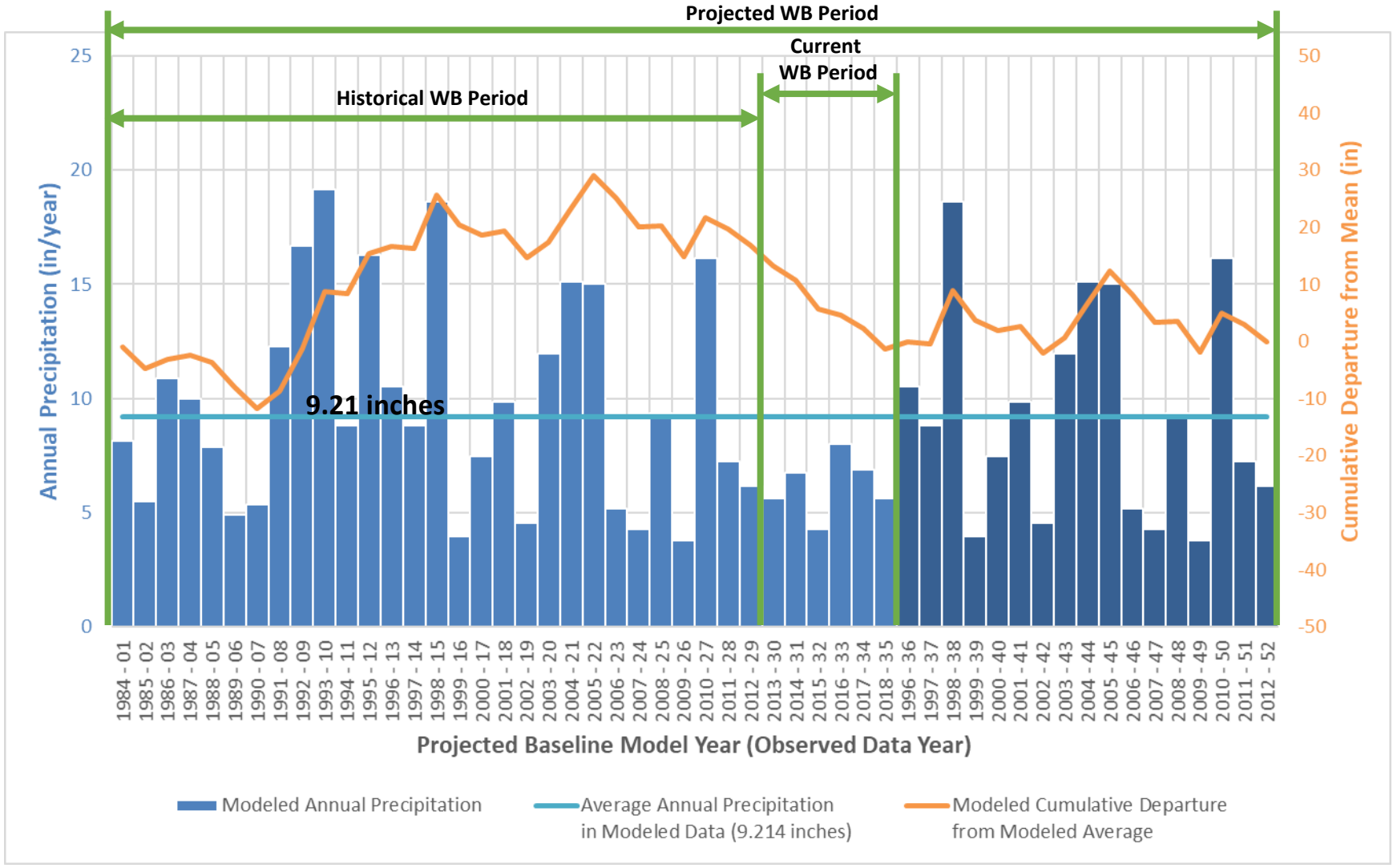


Historical Water Budget – GSP Area

Average Flows During 1984 – 2012, Volumes in AF/Year

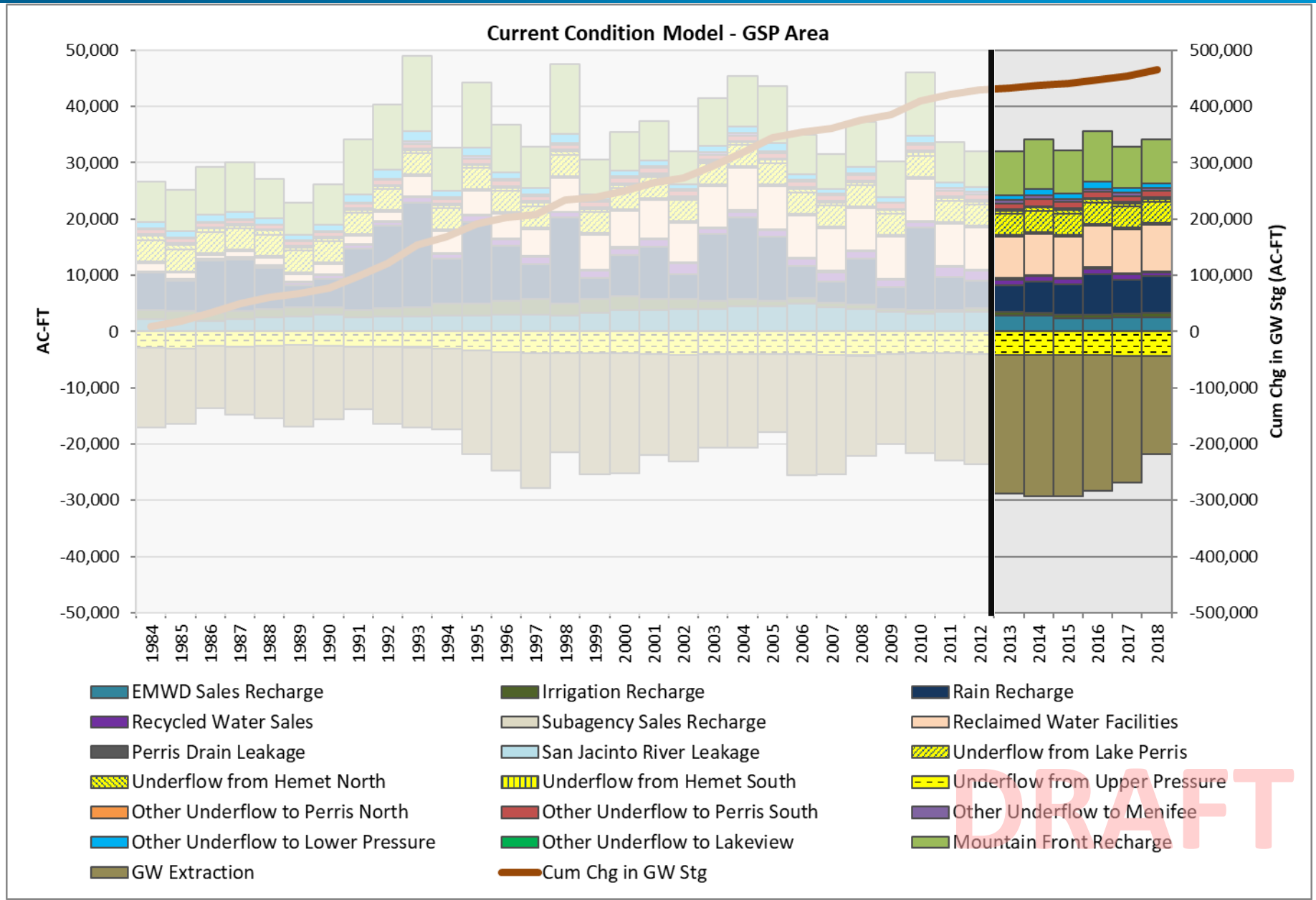


Model Hydrologic Periods



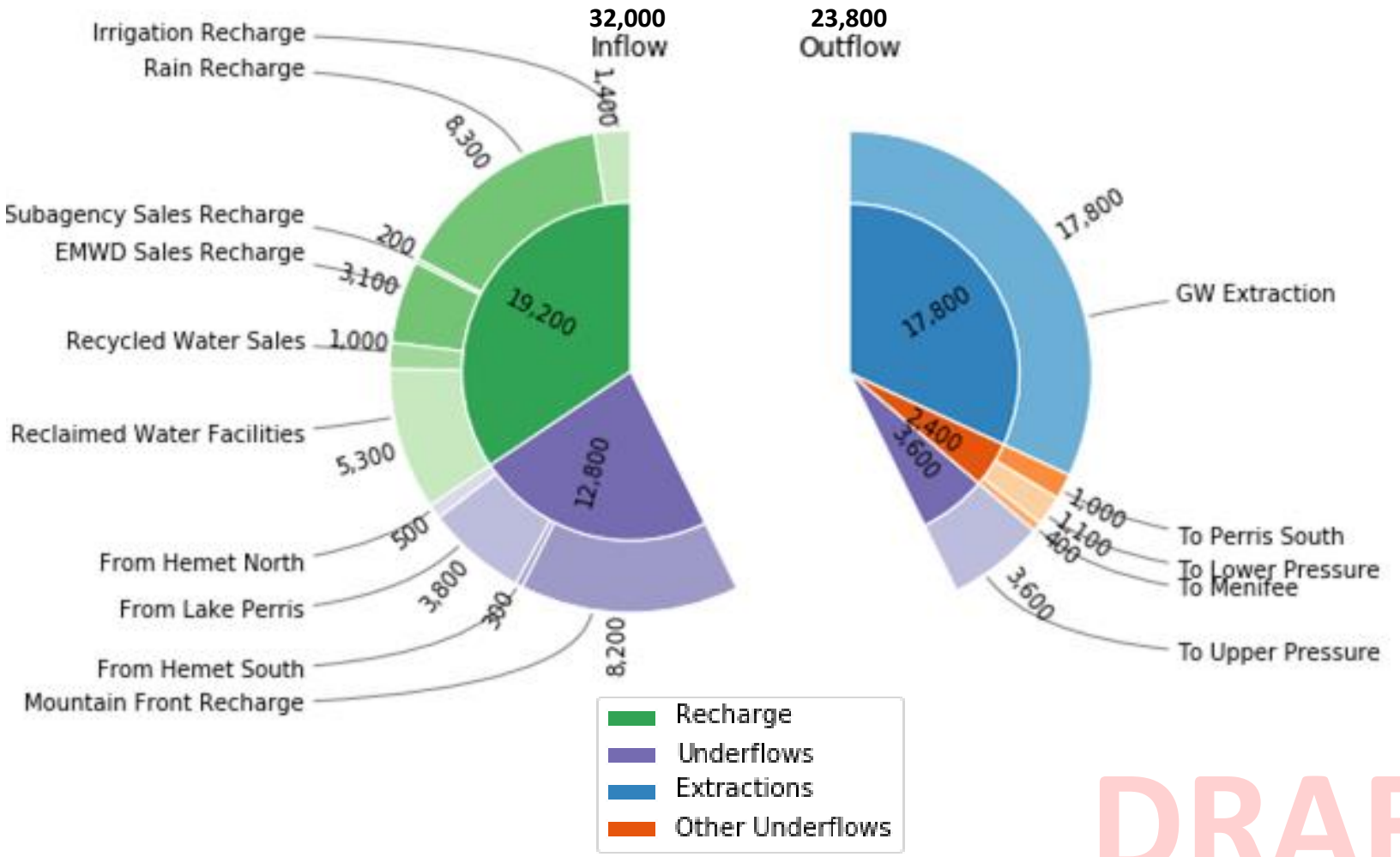
Data Based on Lake Perris Rainfall Gauge

Current Conditions Baseline – GSP Area



Current Conditions GW Budgets

Average Flows During 2013 – 2018, Volumes in AF/Year

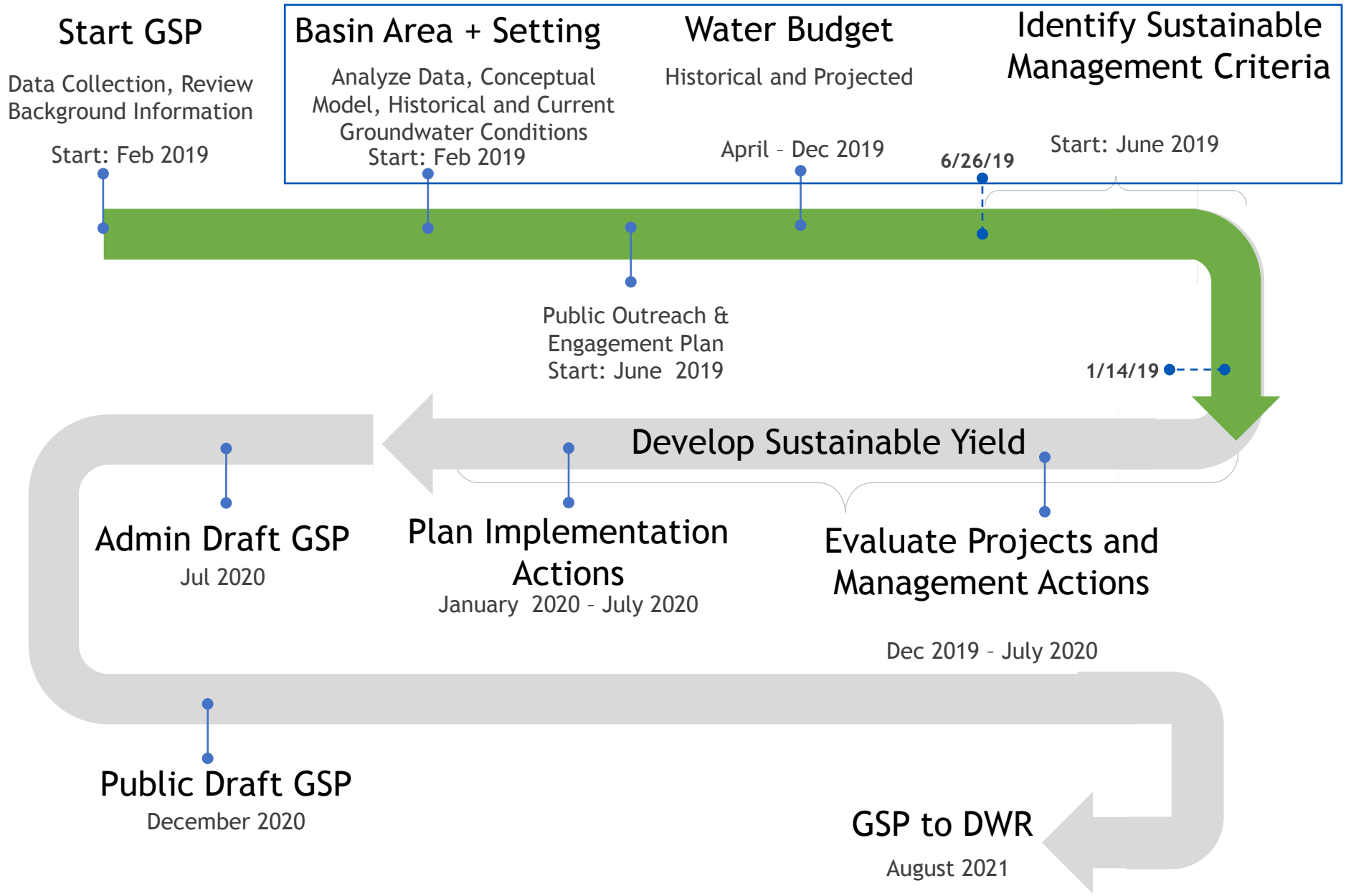


DRAFT

Units: AF/Yr

Timeline and Next Steps

GSP Development Process Update



Next Steps

- EMWD and consultant team will continue to work together to:
  - Conduct future groundwater model scenarios
    - Evaluate the future water budget
  - Continue to define sustainable management criteria
- Next stakeholder advisory group meeting scheduled for April 2020

Questions

West San Jacinto Groundwater Sustainability Agency (GSA) Development of the West San Jacinto Groundwater Sustainability Plan (GSP) – July 14, 2020

Rachel Gray

July 14, 2020

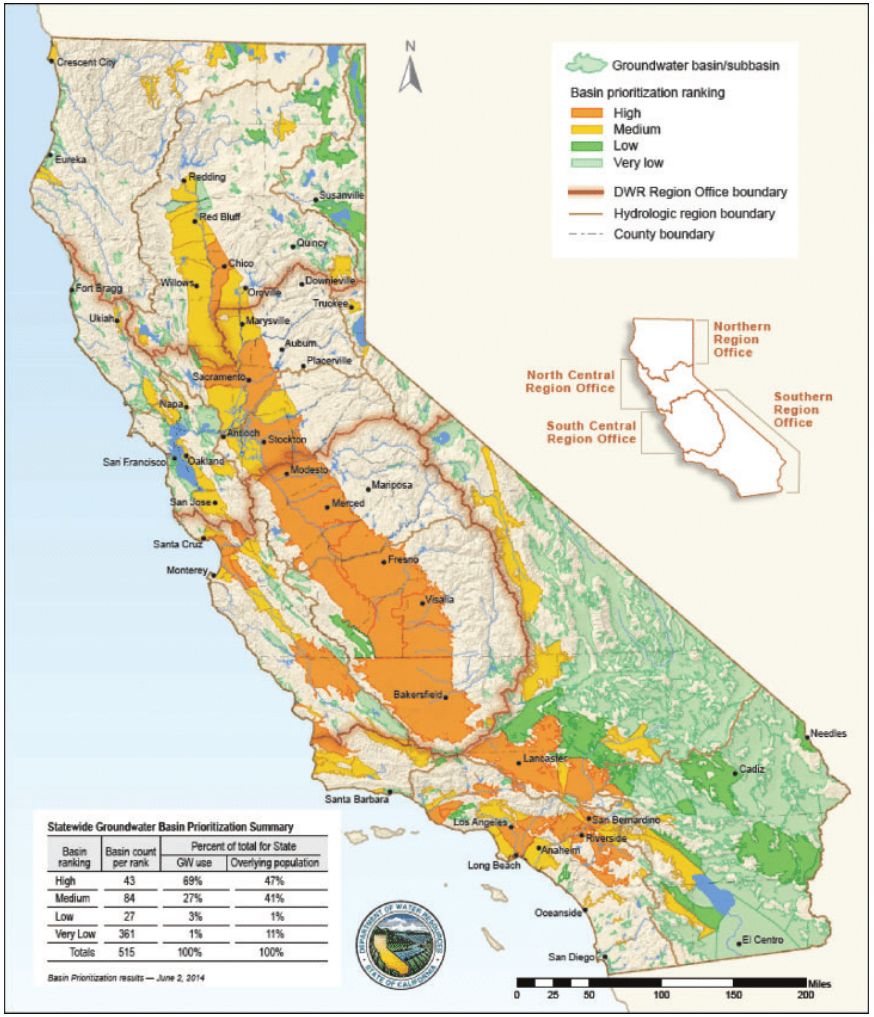
Introduction

- Project Overview
  - What is the Sustainable Groundwater Management Act?
  - What is a Groundwater Sustainability Plan?
- Update on the Groundwater Sustainability Plan Development
  - Historical, Current, and Projected Baseline Water Budgets for the West San Jacinto GSA Area
  - Representative Monitoring Points
  - Minimum Thresholds for Groundwater Levels
  - Timeline and Next Steps
- SGMA Webpage
- Feedback
- Questions and Answers

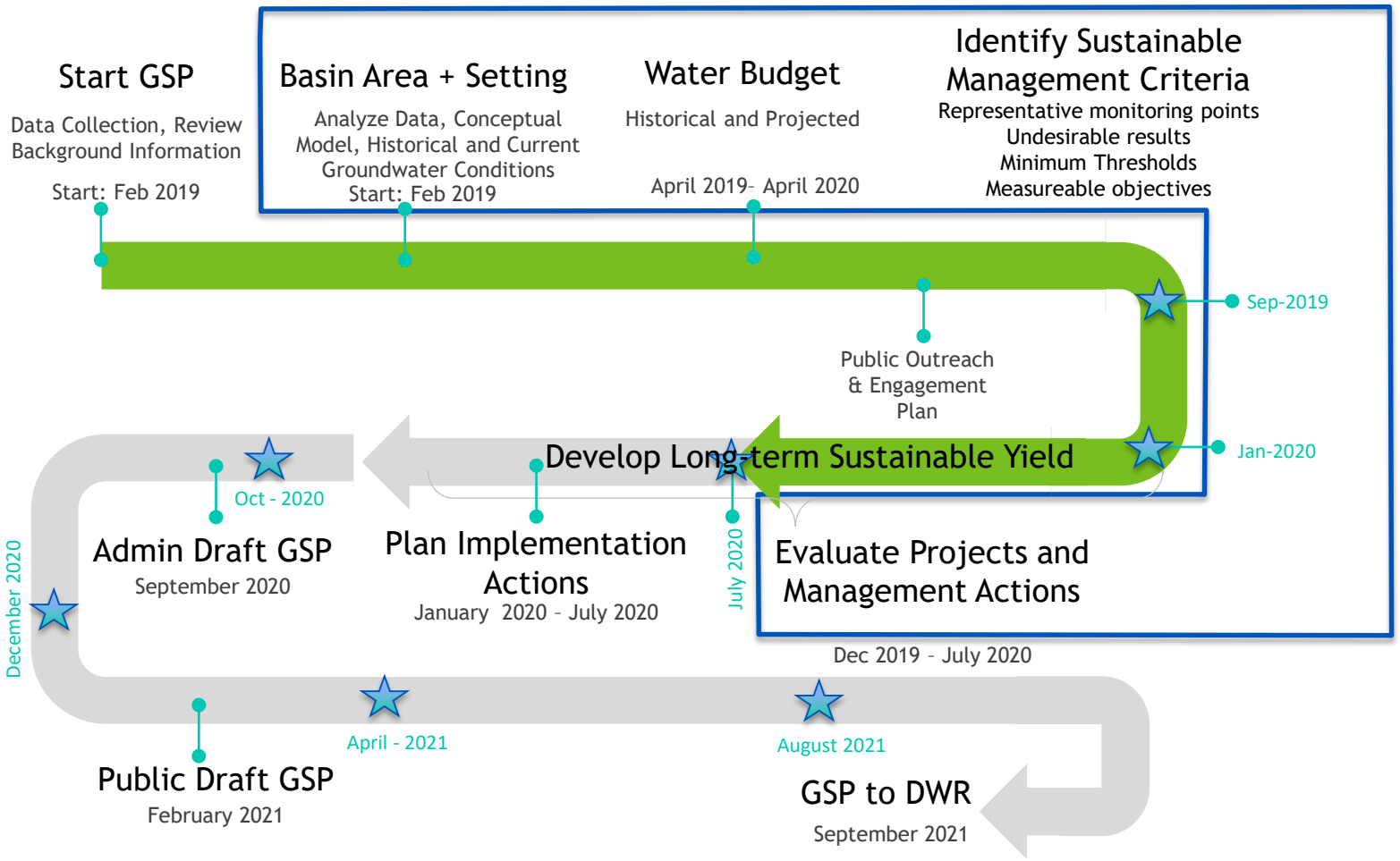
Project Overview

What is the Sustainable Groundwater Management Act?

- Signed September 16, 2014
- Effective January 1, 2015
- Requires:
  - Formation of groundwater sustainability agencies (GSAs) for high and medium priority groundwater basins
  - Preparation of groundwater sustainability plans (GSPs) by 2022
  - Achieve sustainability within 20 years of plan adoption
- "A central tenet of these bills is the recognition that groundwater management is best accomplished locally."
  - Governor Edmund G. Brown Jr.



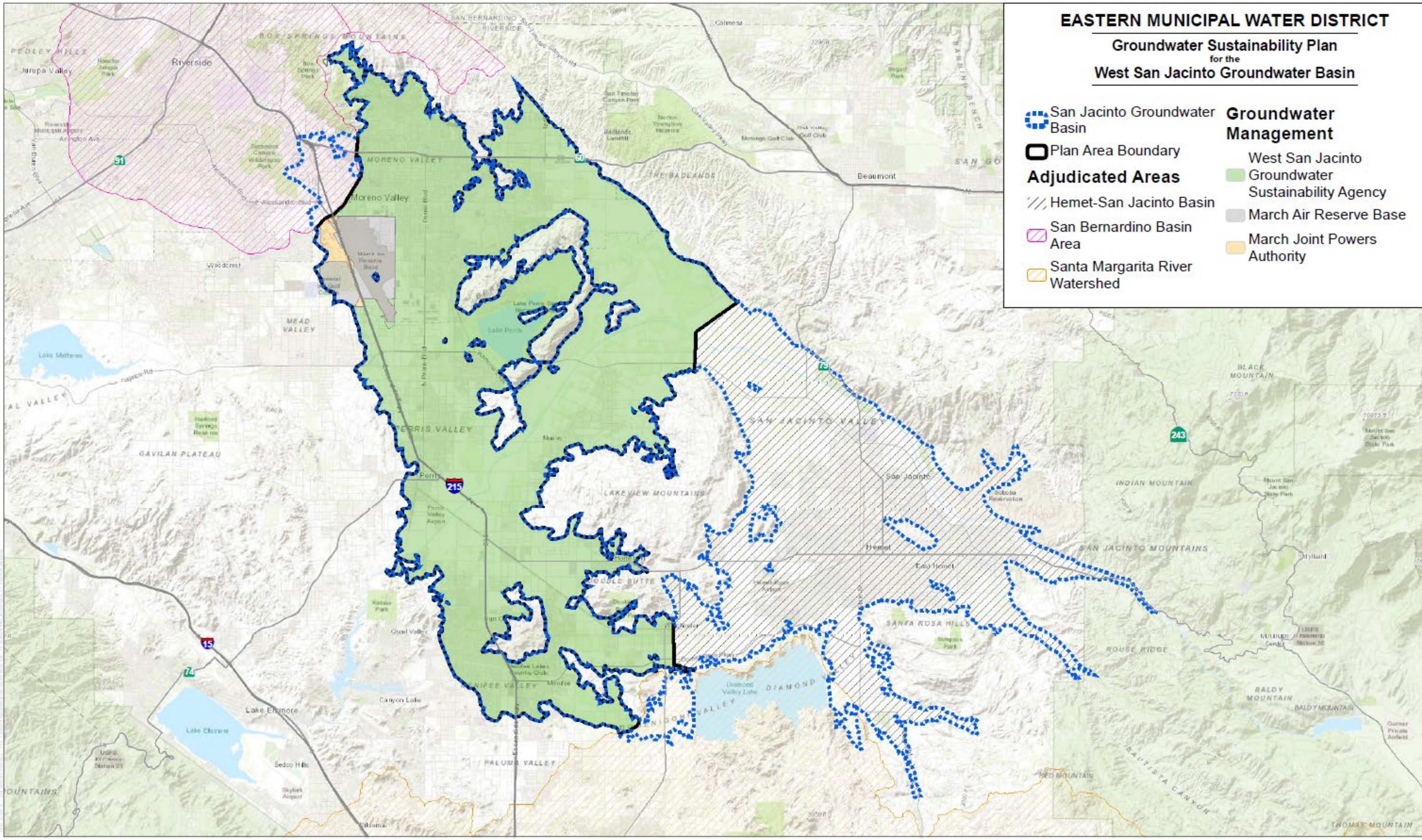
GSP Development Process



Update on the Groundwater Sustainability Plan Development

emwd EASTERN MUNICIPAL WATER DISTRICT

West San Jacinto Groundwater Basin (WSJGB)



Importance of the Monitoring Network

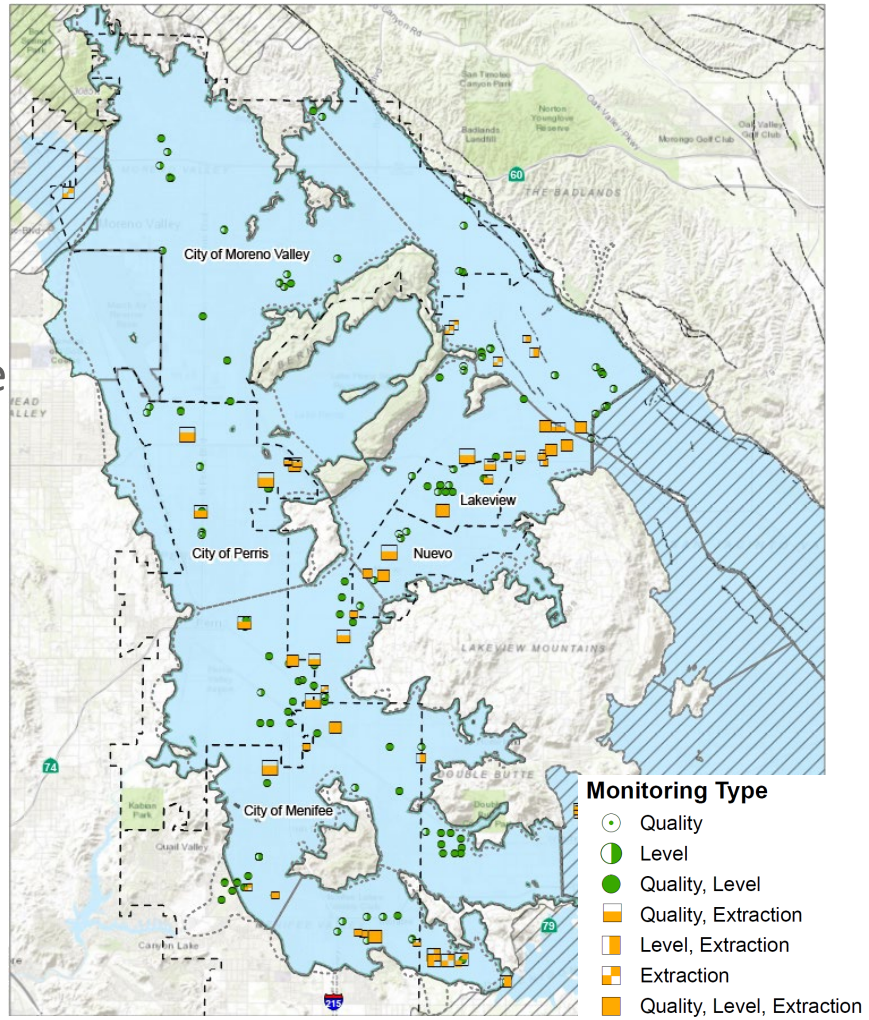
- From the SGMA Emergency Regulations (23 CCR § 354.34. Monitoring Networks):
  - "Each [GSA] shall develop a monitoring network capable of collecting sufficient data to demonstrate short-term, seasonal, and long-term trends in groundwater and related surface water conditions"

- From DWR's Monitoring Network BMP:
  - "Monitoring is a fundamental component necessary to measure progress toward the achievement of any management goal"
  - "SGMA requires GSAs to establish and track" groundwater conditions "for each of the sustainability indicators"
  - "Groundwater monitoring is a fundamental component of SGMA as each GSP must include a sufficient network that provides data"

Monitoring Well Network Evaluation

- 2018 Monitoring Well Network:
  - 175 Total Wells
- Network Density:
  - GSA shall determine the density of monitoring sites and frequency of measurements required to demonstrate short-term, seasonal, and long-term trends
  - Current density: 1.1 wells/mile^2
  - Recommended minimum density:

    0.04 well/mile^2 (4 well/100 mile^2)



Value of Representative Monitoring Points

- 23 CCR § 354.36:
  - "Each [GSA] may designate a subset of monitoring sites as representative of conditions in the basin or an area of the basin"
    - Representative monitoring sites may be designated by the [GSA] as the point at which sustainability indicators are monitored and for which quantitative values for minimum thresholds, measureable objective, and interim milestones are defined

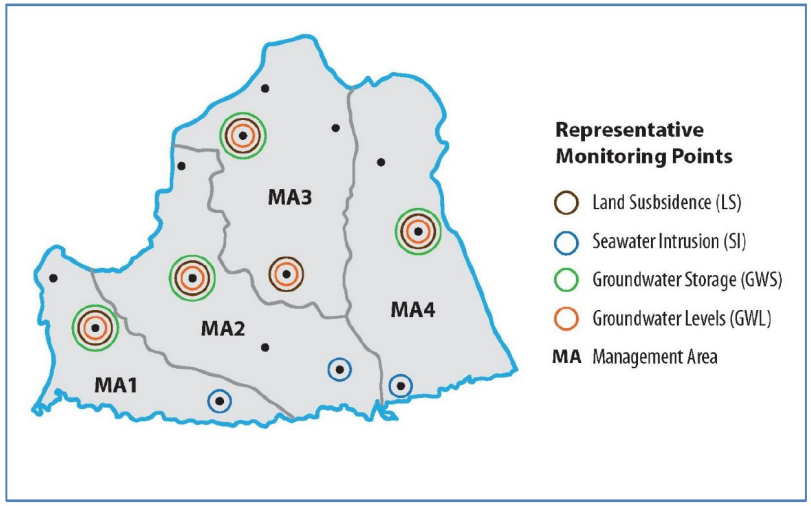


Figure 3: Representative Monitoring Points

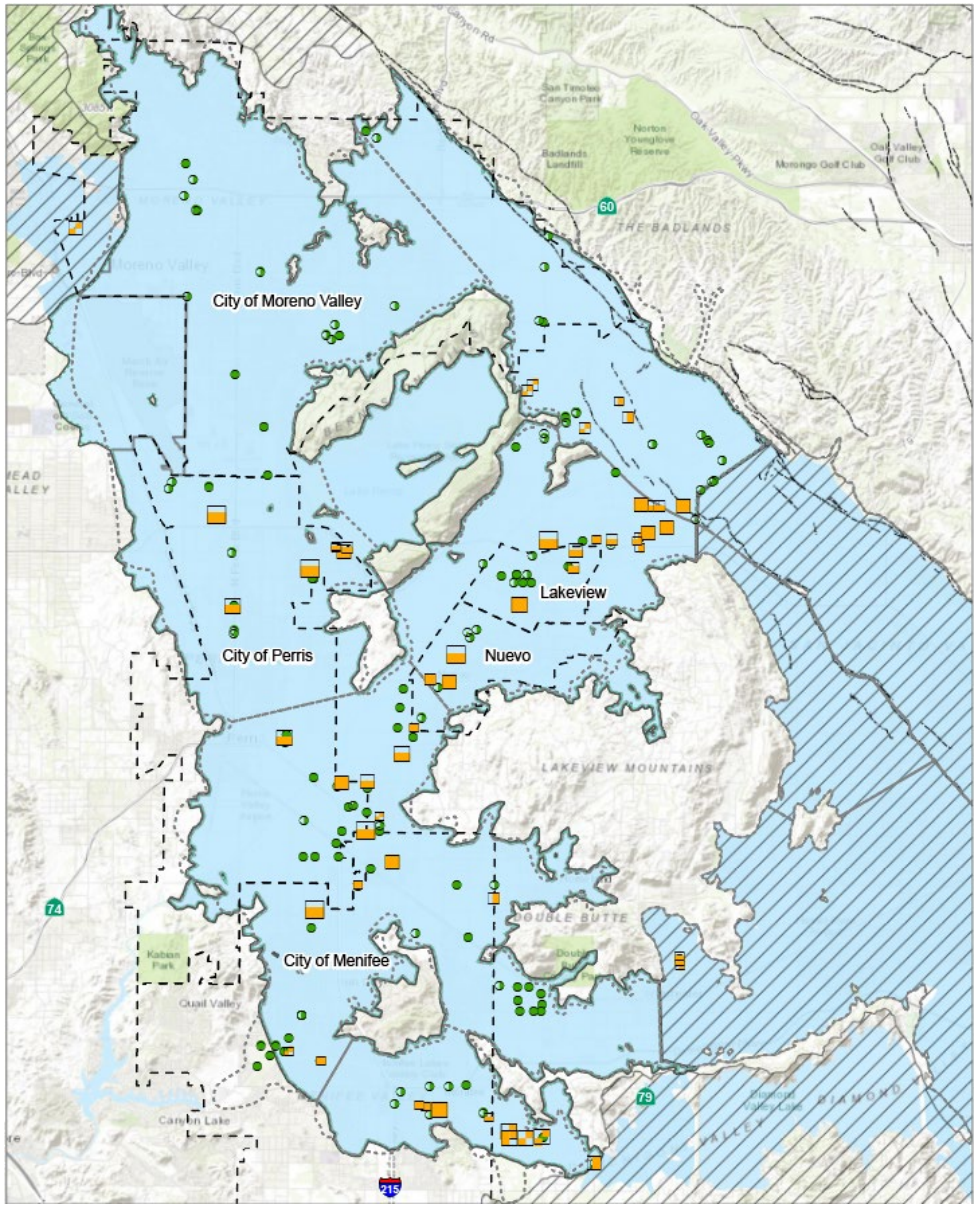
DWR 2016. Monitoring Networks and Identification of Data Gaps BMP

Value of Representative Monitoring Points

- Select sufficient number of representative monitoring points (RMPs) to characterize groundwater conditions in areas of groundwater production throughout the Plan Area
  - Select Sustainable Management Criteria for these points only
    - Minimum Thresholds
    - Measurable Objectives

- Maintain focus on production zones within the Plan Area, rather than management zones for water quality

- **Maintain overall monitoring network to understand basin conditions, EMWD operational requirements, and EMWD non-SGMA regulatory requirements**

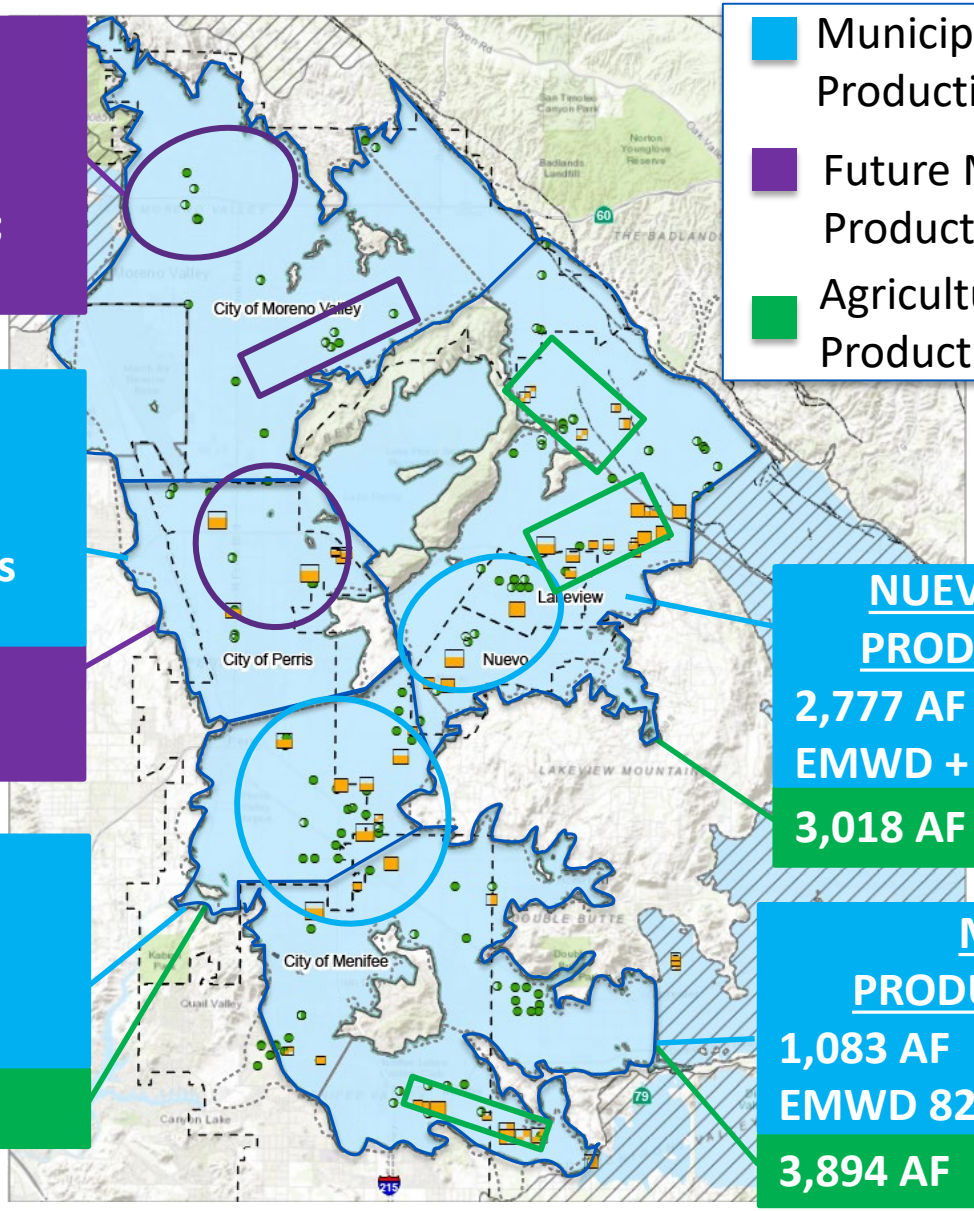


Production Areas

MORENO VALLEY PRODUCTION AREA
4,400 – 6,500 AF
(EMWD 65/66, CCN 1-4; East Well and Santiago)

NORTH PERRIS PRODUCTION AREA
1,947 AF
EMWD + Liberty Utilities (Park Water)
1,050-1,550 AF (EMWD 204)

SOUTH PERRIS PRODUCTION AREA
7,502 AF
Excluding 75/78
185 AF



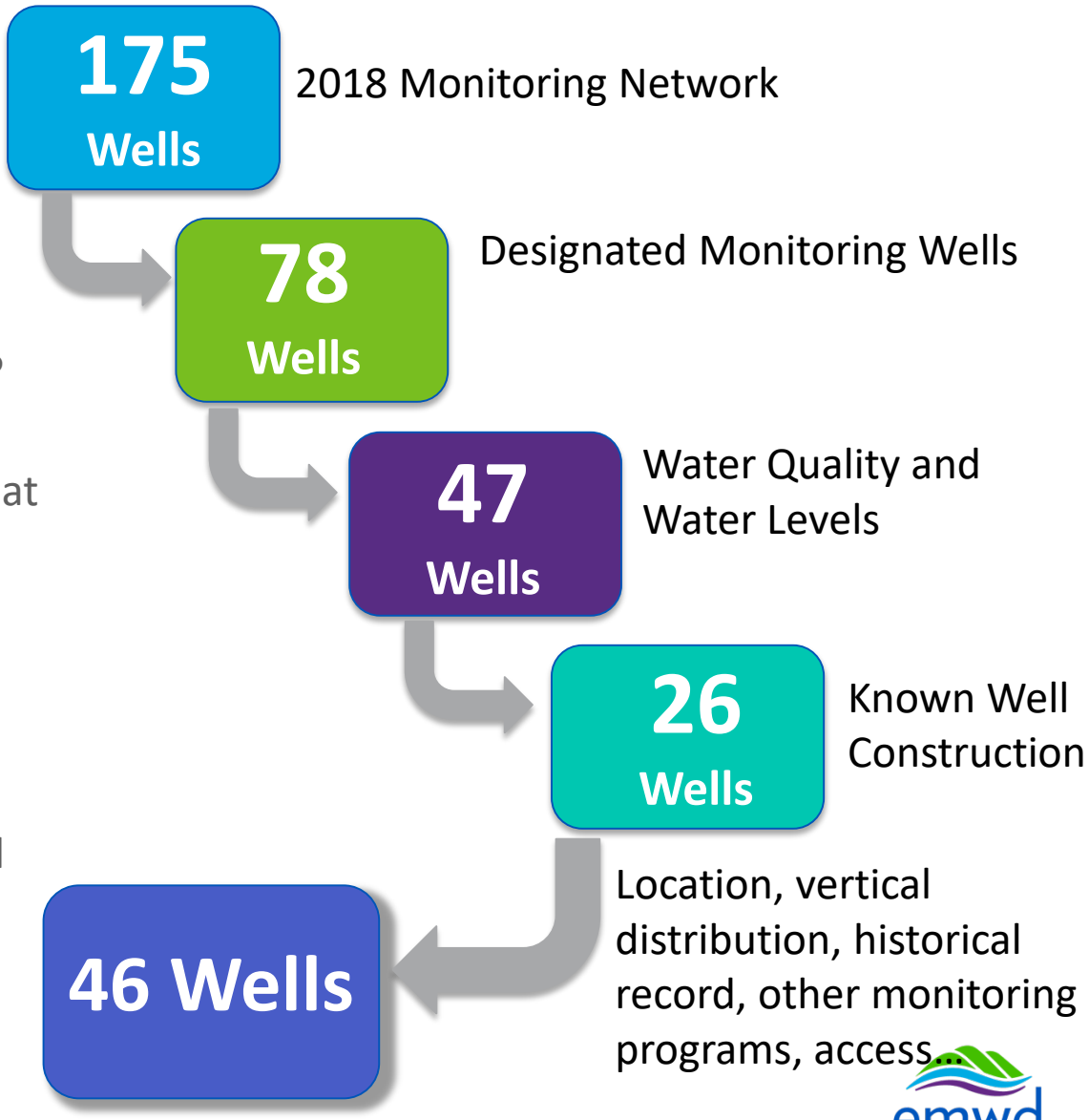
- Municipal Calendar Year Production 2019
- Future Municipal Production
- Agricultural / Private Production 2019

NUEVO/LAKEVIEW PRODUCTION AREA
2,777 AF
EMWD + NWC
3,018 AF

MENIFEE PRODUCTION AREA
1,083 AF
EMWD 82
3,894 AF

Evaluation Criteria for RMP Selection

- Primary designation as a monitoring well
- Ability to collect both water quality and water level samples
- Known well construction
- Geographic location of the RMP within the Plan Area
- Length of historical data record at the RMP
- Inclusion of RMP in additional monitoring programs
- Vertical distribution of well screen intervals for each RMP
- Long-term accessibility and well ownership considerations



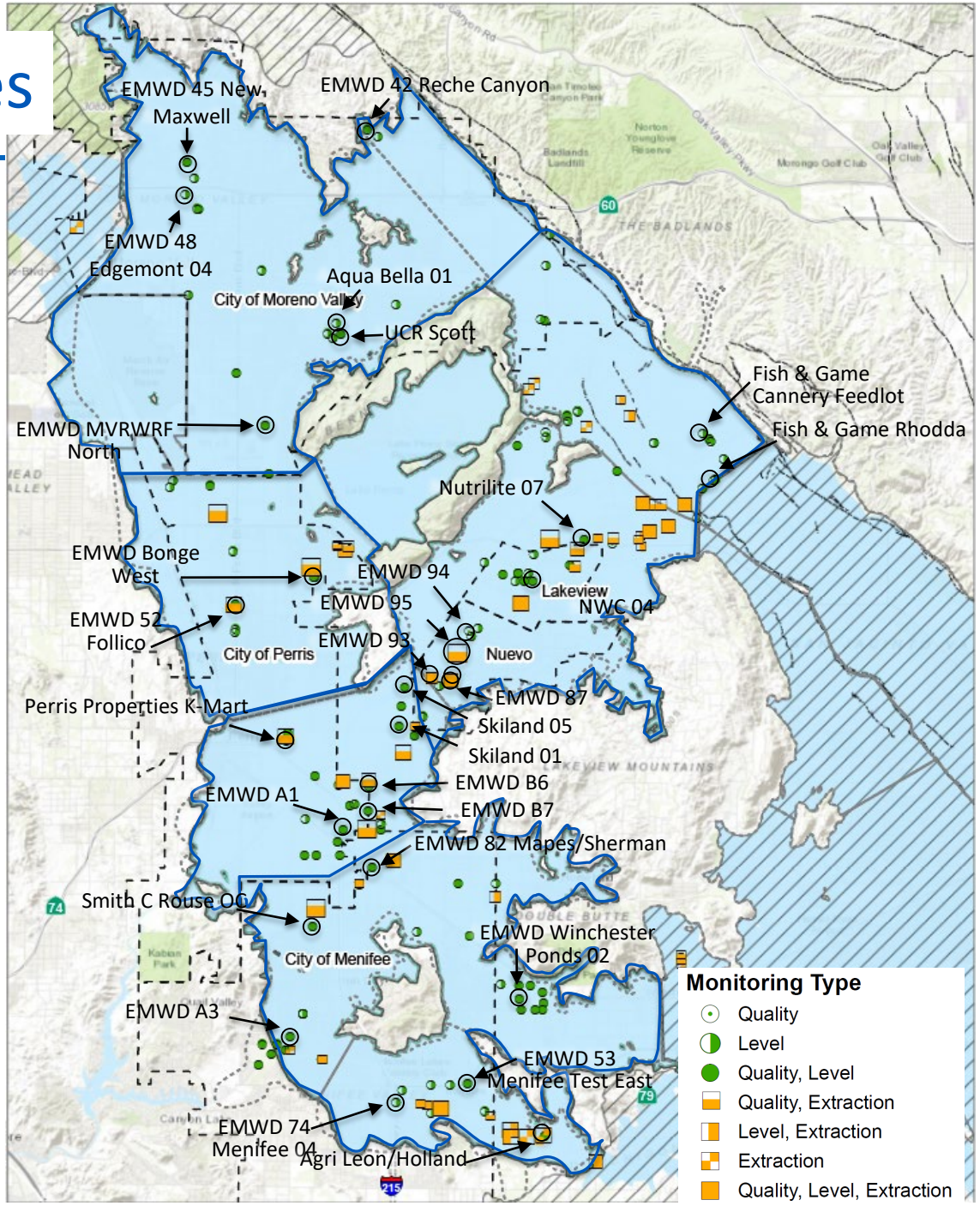
Site Ranking

- Potential Sites Ranked Using Initial Screening Criteria:
  - Active Extraction Well?
    - No: 1 point
  - Monitoring Type
    - Quality *and* level: 2 points
    - Quality *or* Level: 1 point
  - Perforations
    - 1 point if representative
  - EMWD Well?
    - Yes: 1 point
  - Basin Plan Well?
    - Yes: 1 point
  - Perris II MRP Well?
    - Yes: 1 point
  - Perris II MRP Sentinel Well?
    - Yes: 1 point

Casing Name	Active Extraction?	Monitoring Type?	Perforations?	Representative Perforations?	EMWD Well	Basin Plan Well	Perris II Well?	Sentinel Well?	Rank
EMWD A1	**No**	**Quality, Level**	**290-310; 555-575**	**Yes**	**Yes**	**Yes**	**Yes**	**No**	**8**
EMWD Skiland 05	**No**	**Quality, Level**	**313-567**	**Yes**	**Yes**	**Yes**	**Yes**	**No**	**8**
Nutrilite 07	**No**	**Quality, Level**	**390-697**	**Yes**	**No**	**No**	**Yes**	**Yes**	**7**
EMWD 74 Menifee 04	**No**	**Quality, Level**	**220-640**	**Yes**	**Yes**	**Yes**	**No**	**No**	**7**
EMWD A3	No	Quality, Level	560-580	Yes	Yes	No	Yes	No	7
EMWD Skiland 01	No	Quality, Level	360-720	Yes	Yes	No	Yes	No	7
EMWD 52 Follico	**No**	**Quality, Level**	**290-665**	**Yes**	**Yes**	**No**	**No**	**No**	**6**
EMWD B6	No	Quality, Level	230-250	Yes	Yes	Yes	Yes	No	6
NWC 04	No	Quality, Level	104-518	Yes	No	No	Yes	No	6
EMWD 45 New Maxwell	No	Quality, Level	360-430	Yes	Yes	No	No	No	6
Perris Properties Kmart	No	Quality, Level	170-430	Yes	No	No	Yes	No	6
Fish & Game Cannery Feedlot	No	Quality, Level	350-720	Yes	No	Yes	No	No	6
EMWD 94	**Yes**	**Quality**	**185-380;420-580**	**Yes**	**Yes**	**No**	**Yes**	**No**	**5**
EMWD Winchester Ponds 02	No	Quality, Level	52-75	Yes	Yes	Yes	No	No	5
EMWD B7	No	Quality, Level	230-250	Yes	Yes	No	Yes	No	5
EMWD 95 13th St.	Yes	Quality, Extraction	200-360;380-420	Yes	Yes	No	Yes	No	5
EMWD 87 Nuevo/Olivas	Yes	Quality, Level,	150-380	Yes	Yes	No	Yes	No	5
EMWD 93 Nuevo/Menifee	Yes	Quality, Level, Extraction	200-264;274-330	Yes	Yes	No	Yes	No	5
EMWD 53 Menifee Test East	No	Quality, Level	NA	NA	Yes	No	Yes	No	5
Agri Leon/Holland	Yes	Quality, Level	150-509	Yes	No	Yes	No	No	5
EMWD 48 Edgemont 04	No	Quality, Level	NA	NA	Yes	Yes	No	No	5
EMWD 42 Reche Canyon	No	Quality, Level	NA	NA	Yes	Yes	No	No	5
UCR Scott	***No***	***Quality, Level***	***Unknown perfs; may be as deep as 600 ft.***	***NA***	***No***	***No***	***No***	***No***	***4***
Aqua Bella 01	***No***	***Level***	***246-360;380-735;735-755***	***Yes***	***No***	***No***	***No***	***No***	***4***
EMWD MVRWRF North	No	Quality, Level	70-110	No	Yes	No	No	No	4
Smith C Nuevo/Olivas	No	Quality, Level	NA	NA	No	Yes	No	No	4
EMWD 51 Bonge West	No	Quality, Level	NA	NA	Yes	No	No	No	4
Smith C Rouse OC	No	Quality, Level	NA	NA	No	No	Yes	No	4
Smith C Jackson	No	Quality, Level	NA	NA	No	No	Yes	No	4
Fish & Game Rhodda	No	Level	700-1187	Yes	No	No	No	No	4
DeVuyst Alfalfa OC	No	Level	NA	NA	No	No	Yes	No	3
Fish & Game South	No	Quality, Level	NA	NA	No	No	No	No	3
Fish & Game West	No	Quality, Level	NA	NA	No	No	No	No	3
Cactus II Feeder MW-1	No	Level	24-28	No	No	No	No	No	3
Cactus II Feeder MW-2	No	Level	19-23	No	No	No	No	No	3
Southern CA Edison	No	Quality, Level	NA	NA	No	No	No	No	3
Fish & Game Bouris	Yes	Quality, Level	NA	NA	No	Yes	No	No	3
Fish & Game Fence	No	Quality, Level	NA	NA	No	No	No	No	3
Marvo Holsteins East (List)	Yes	Quality, Level, Extraction	200-240;320-520;560-900	Yes	No	No	No	No	3
USGS Sun City Golf Course Blue	No	Level	155-160	No	No	No	No	No	2
USGS Sun City Golf Course	No	Level	237-242	No	No	No	No	No	2
USGS Sun City Golf Course Red	No	Level	425-430	No	No	No	No	No	2
USGS Sun City Golf Course	No	Level	365-370	No	No	No	No	No	2
Nutrilite 08	Yes	Quality, Extraction	NA	NA	No	No	Yes	No	2
Nutrilite 02	Yes	Quality, Extraction	NA	NA	No	No	Yes	No	2
USGS Gilman Springs/Virginia	No	Level	NA	NA	No	No	No	No	2

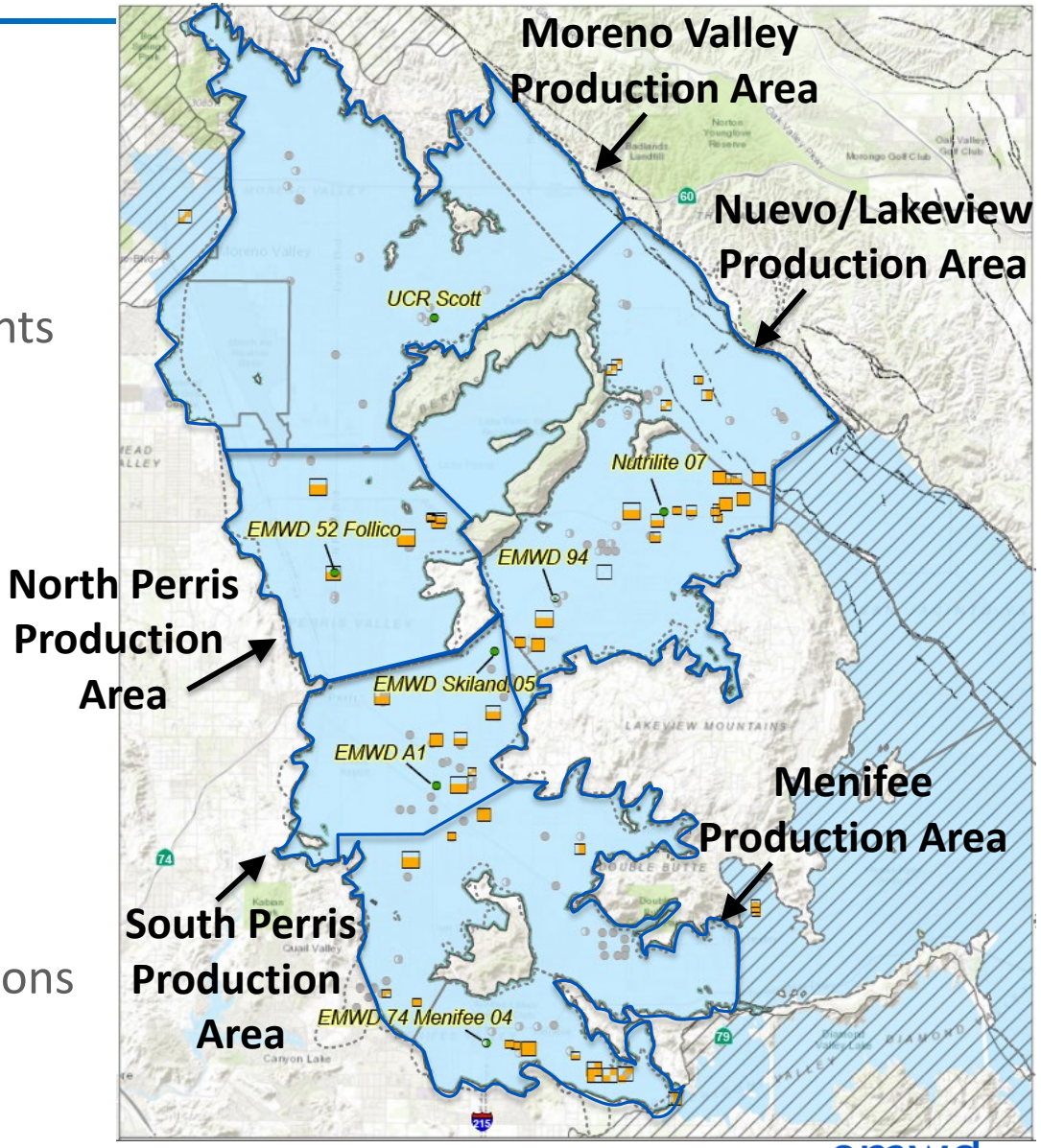
Higher Ranked Sites

- Eliminate wells scoring 3 or lower in ranking system
- Review remaining potential sites with EMWD staff
- Focus
  - Wells near active or planned production
  - Wells with representative water levels
  - Wells with representative perforation intervals



Recommended Wells

- Review water level hydrographs within each production area to select potential representative monitoring points
- 7 representative monitoring points
  - Nutrilite 07
  - EMWD 94
  - EMWD Skiland 05
  - EMWD A1
  - EMWD 74 Menifee 04
  - EMWD 52 Follico
  - UCR Scott*
    - * Pending video log to determine well perforations



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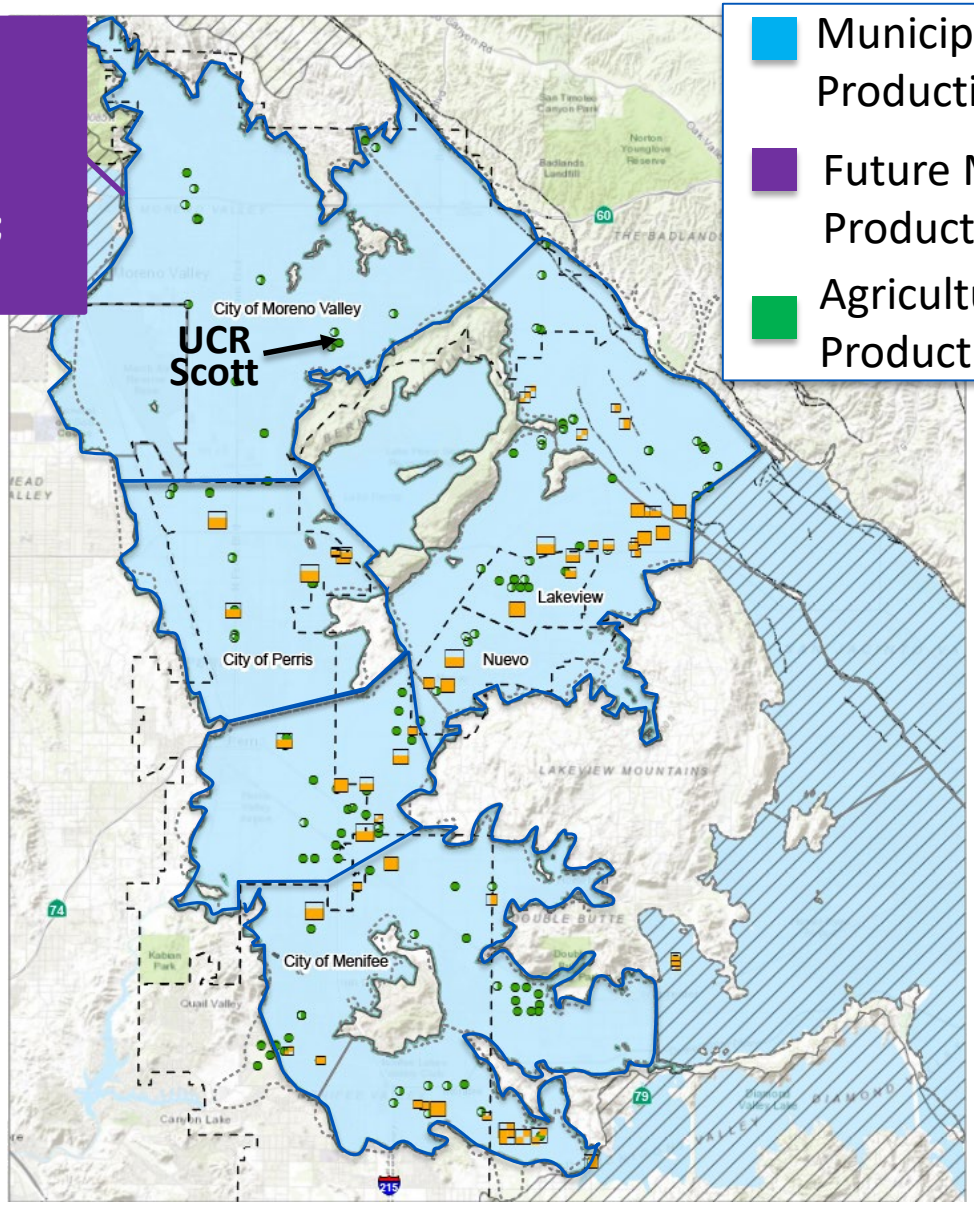
Production Areas

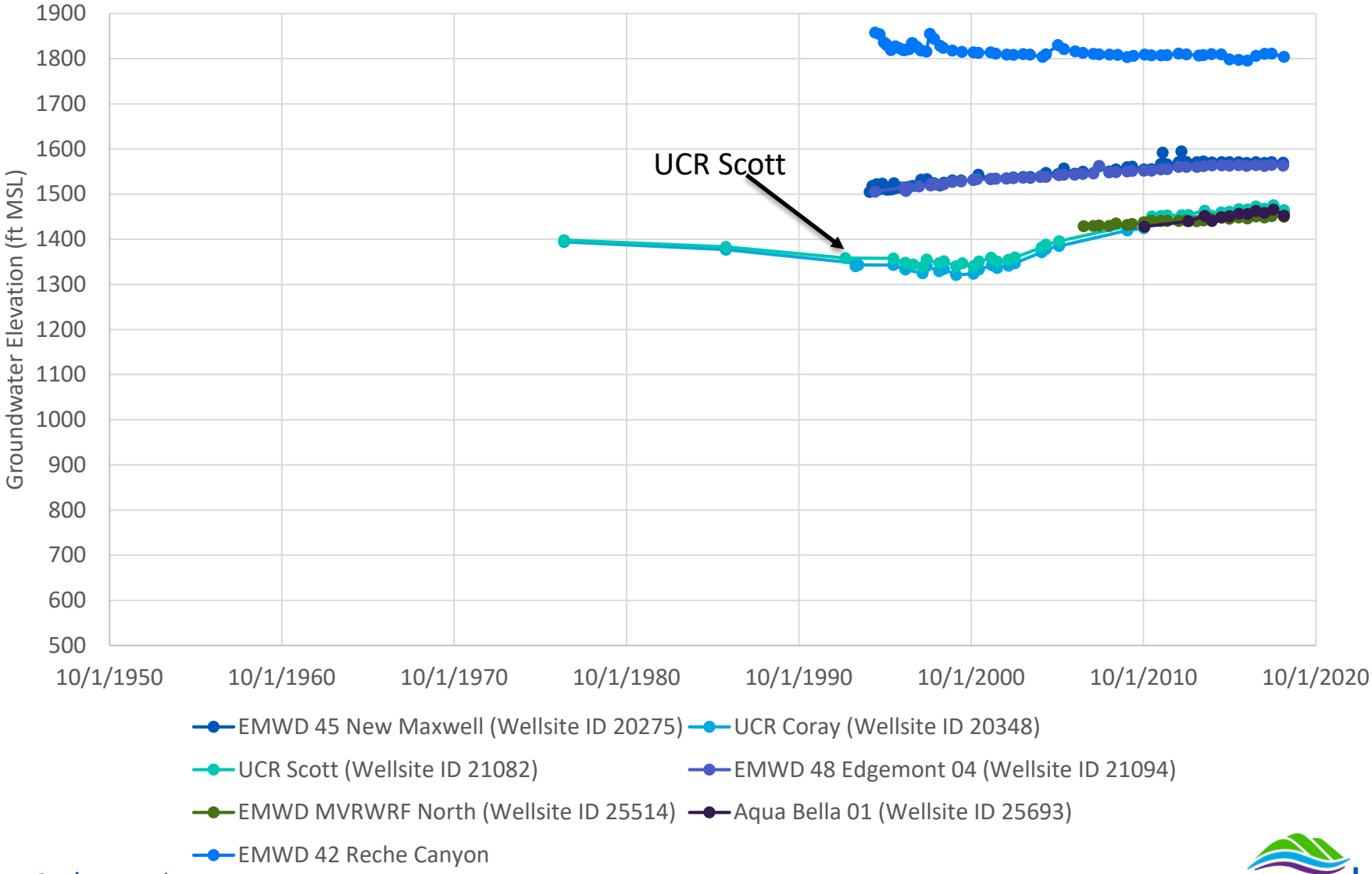
MORENO VALLEY PRODUCTION AREA

4,400 – 6,500 AF
(EMWD 65/66, CCN 1-4; East Well and Santiago)



- Municipal Calendar Year Production 2019
- Future Municipal Production
- Agricultural / Private Production 2019

Water Levels: Moreno Valley Production Area



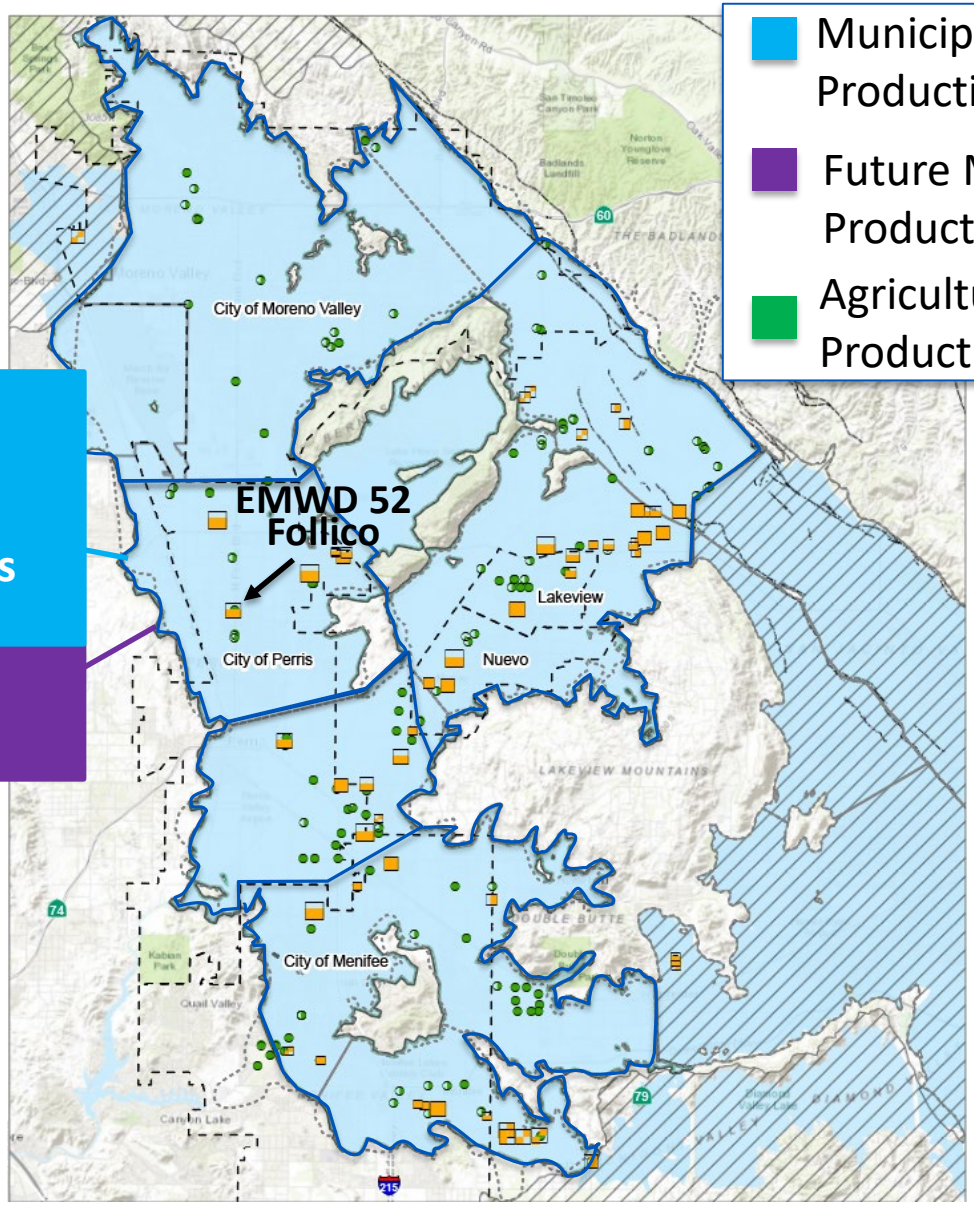
Production Areas

NORTH PERRIS PRODUCTION AREA

1,947 AF

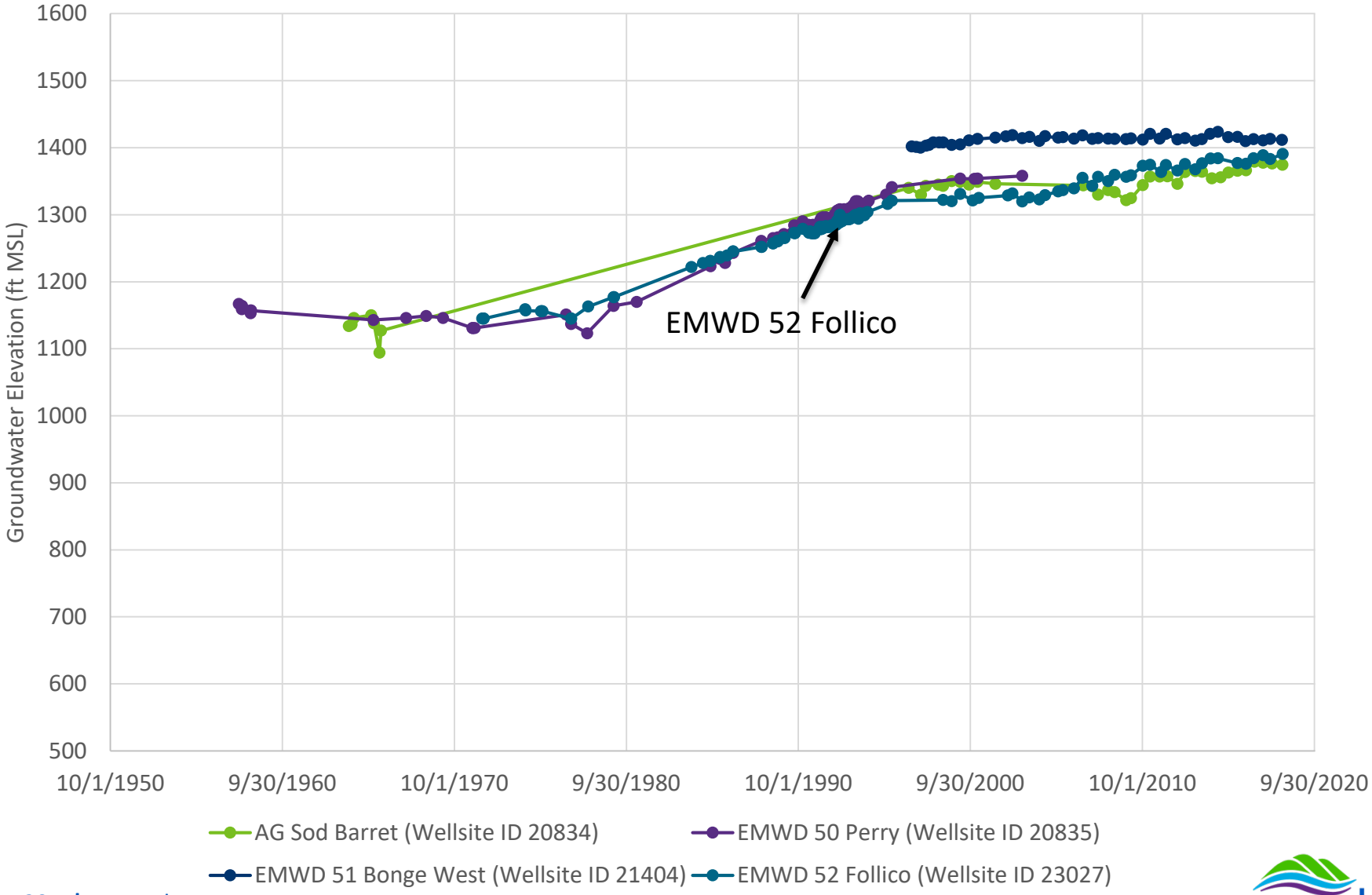
EMWD + Liberty Utilities (Park Water)

1,050-1,550 AF (EMWD 204)

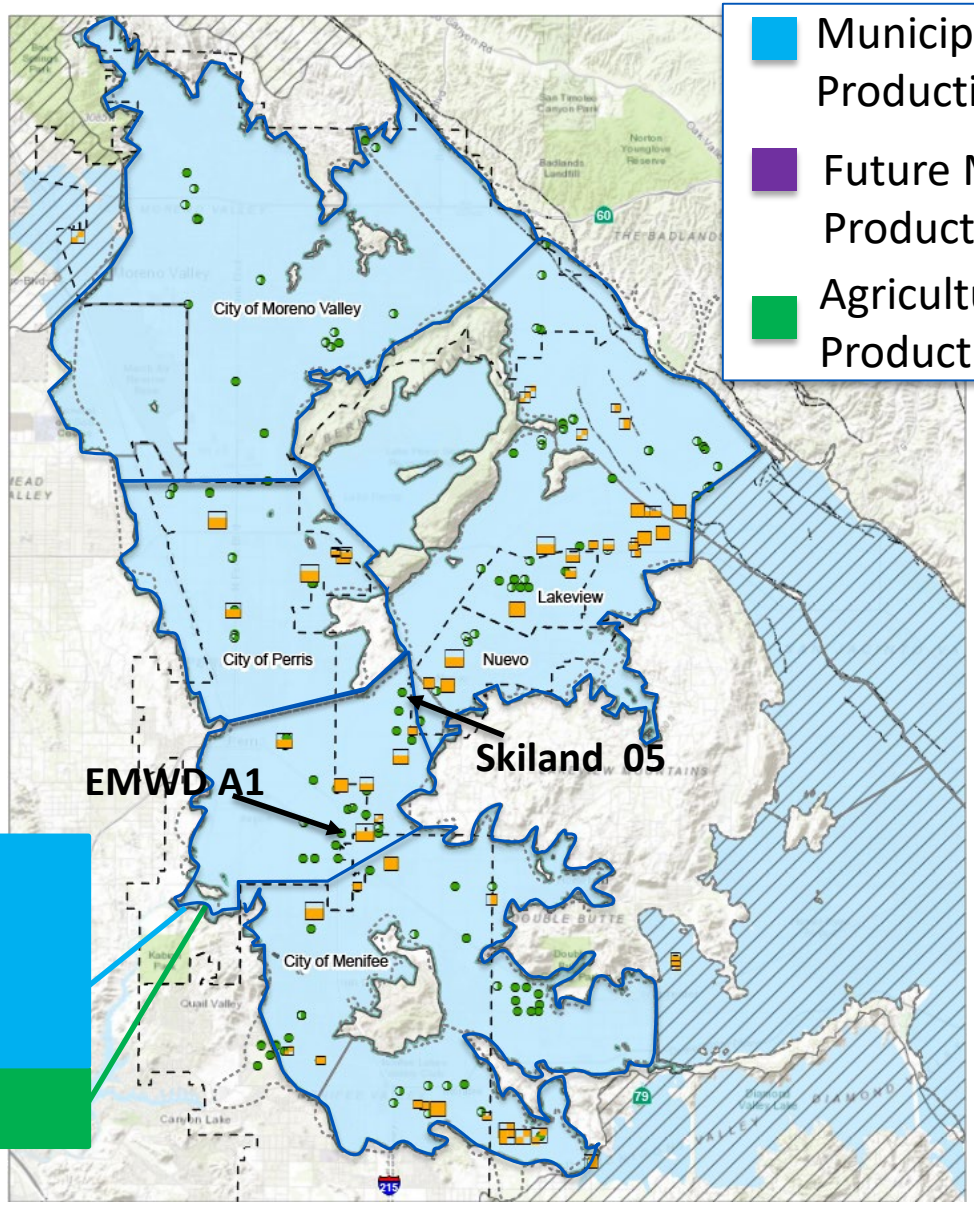


- Municipal Calendar Year Production 2019
- Future Municipal Production
- Agricultural / Private Production 2019

Water Levels: North Perris Production Area



Production Areas



Municipal Calendar Year Production 2019

Future Municipal Production

Agricultural / Private Production 2019

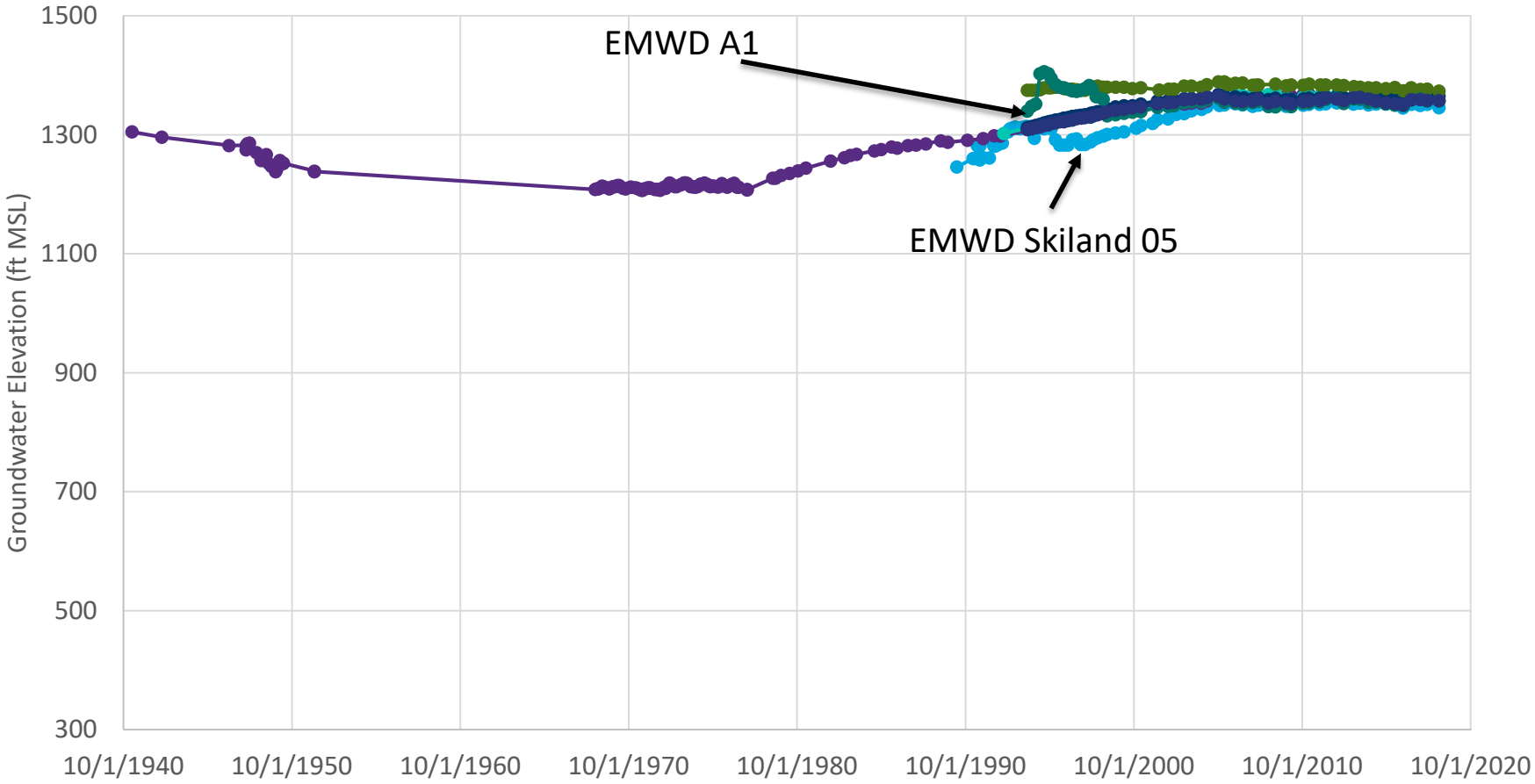
SOUTH PERRIS PRODUCTION AREA

7,502 AF

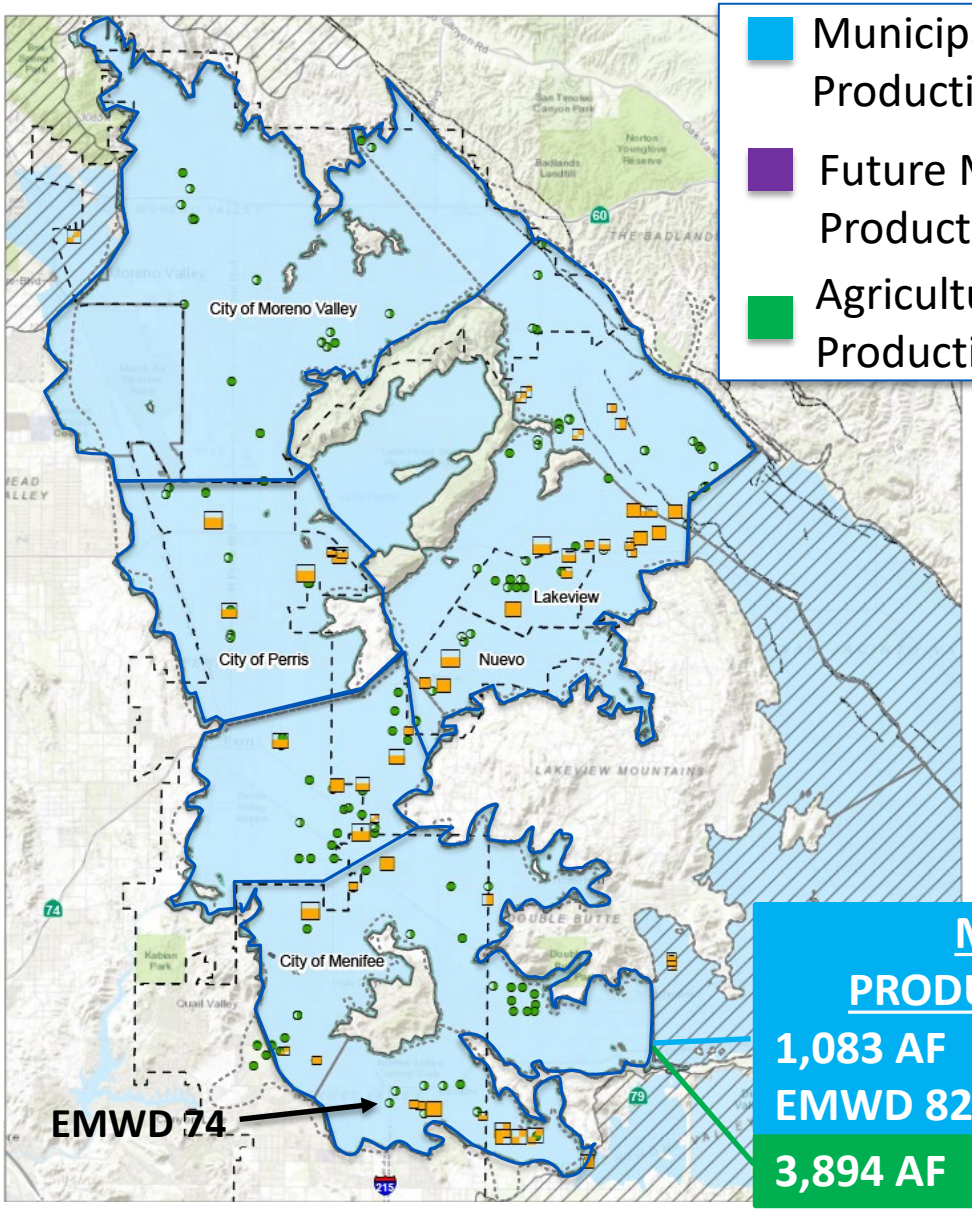
Excluding 75/78

185 AF

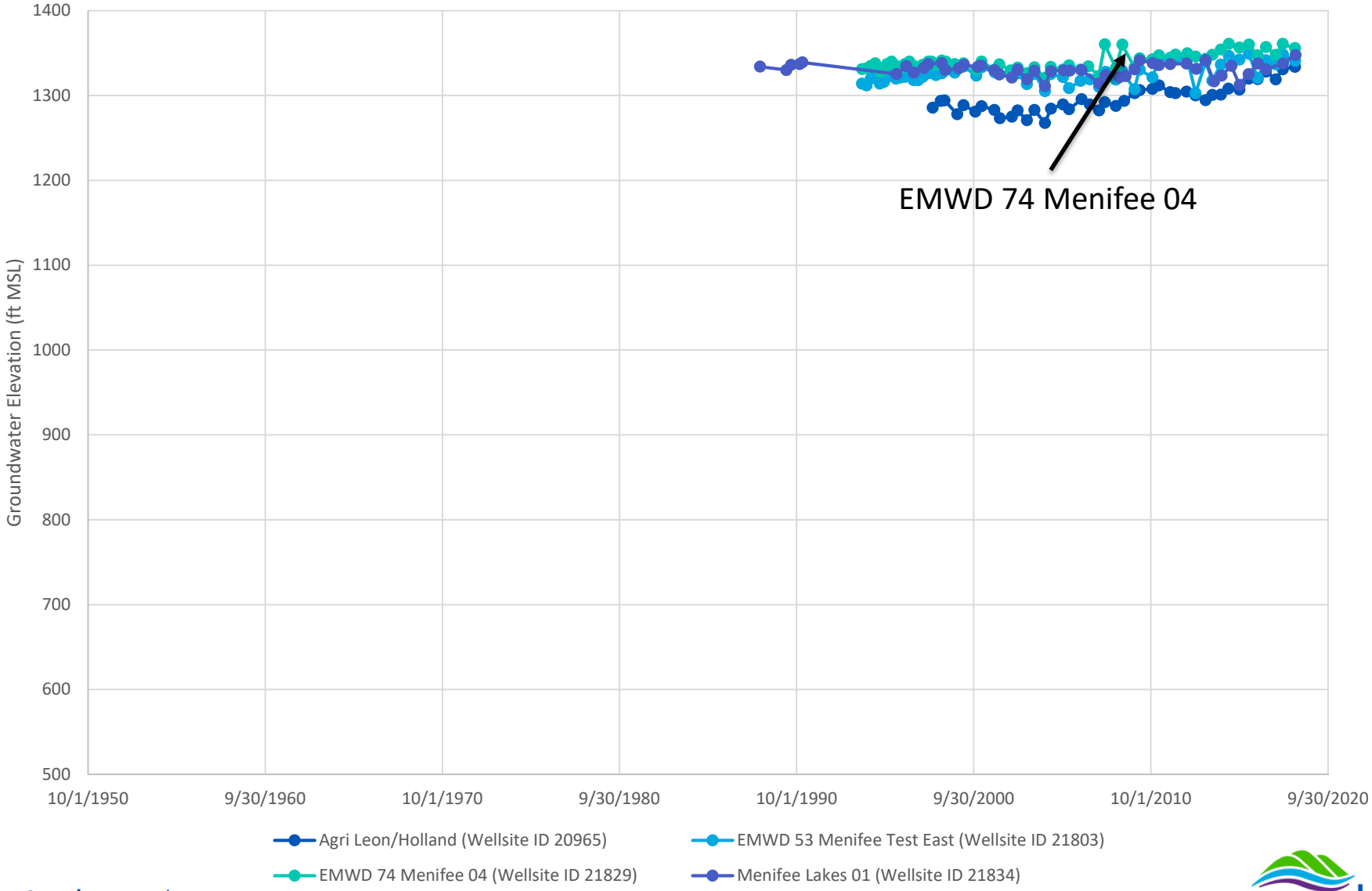
Water Levels: South Perris Production Area



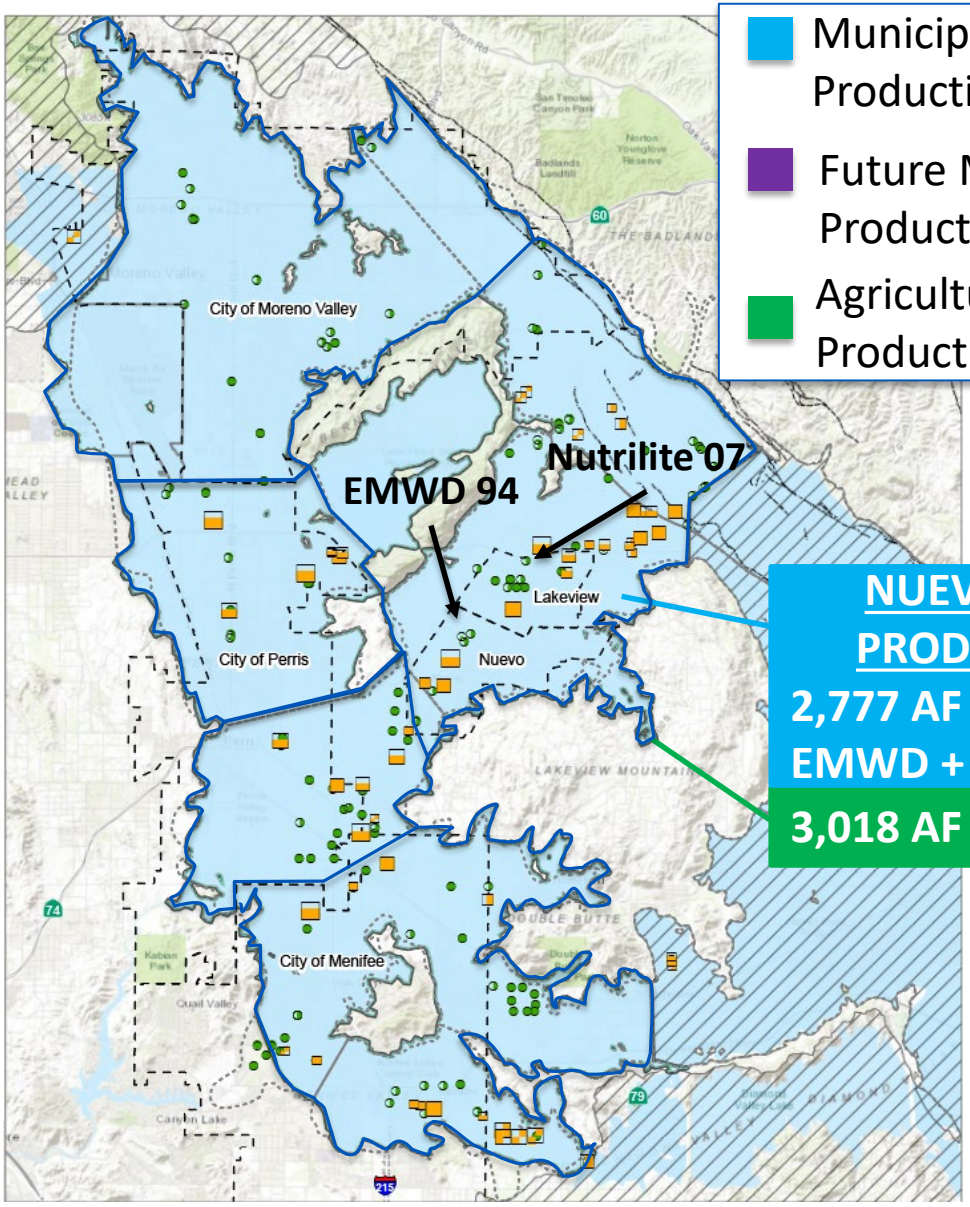
Production Areas



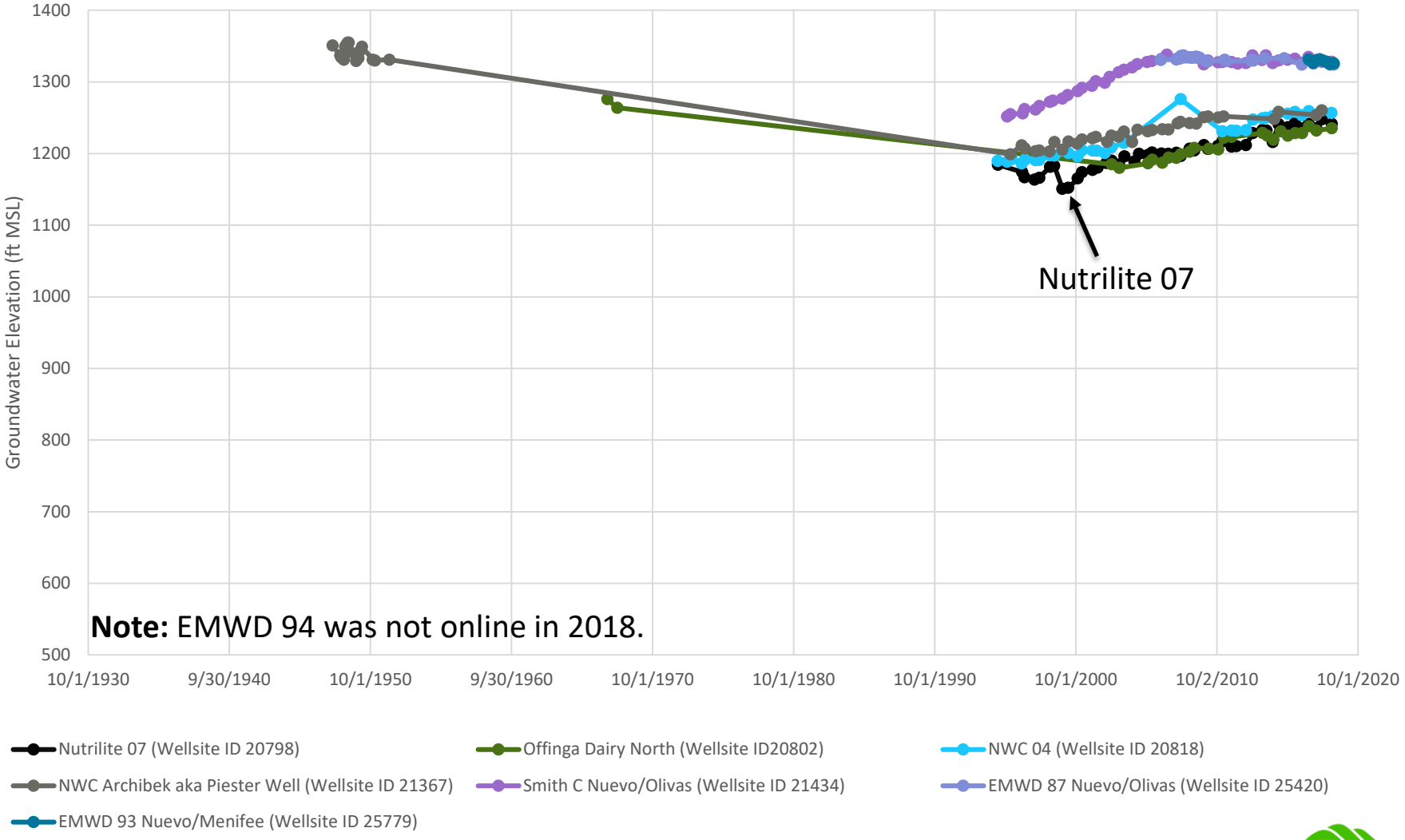
Water Levels: Menifee Production Area



Production Areas

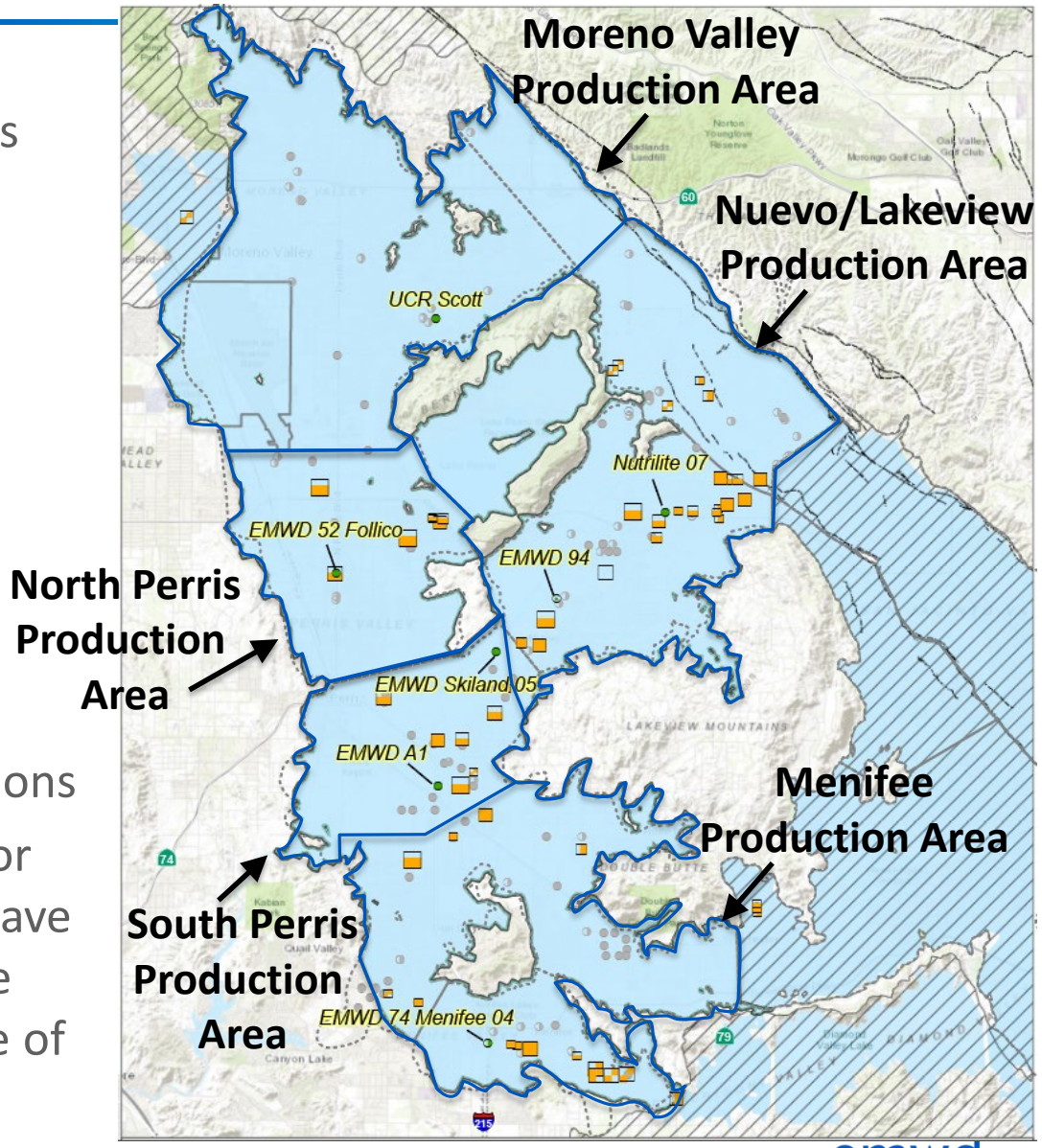


Water Levels: Nuevo/Lakeview Area



Recommended Wells

- 7 currently recommended representative monitoring points
  - Nutrilite 07
  - EMWD 94
  - EMWD Skiland 05
  - EMWD A1
  - EMWD 74 Menifee 04
  - EMWD 52 Follico
  - UCR Scott*
    - * Pending video log to determine well perforations
- Add monitoring well (or wells) for Perris North project once they have been drilled and water levels are determined to be representative of aquifer conditions



emwd

Minimum Thresholds Under SGMA

- From the SGMA Emergency Regulations:
  - "Each Agency in its Plan shall establish minimum thresholds that quantify groundwater conditions for each applicable sustainability indicator at each monitoring site or representative monitoring site established pursuant to Section 354.36 (Representative Monitoring)" (23 CCR § 354.28. Minimum Thresholds)
  - "'Minimum thresholds' refers to a numeric value for each sustainability indicator used to define undesirable results." (23 CCR § 351(t))

SUSTAINABILITY INDICATORS: TODAY'S FOCUS

Groundwater elevation

Groundwater in storage

To Be Discussed:

Groundwater quality

Interconnected surface water and groundwater

Land Subsidence

Seawater Intrusion – not applicable

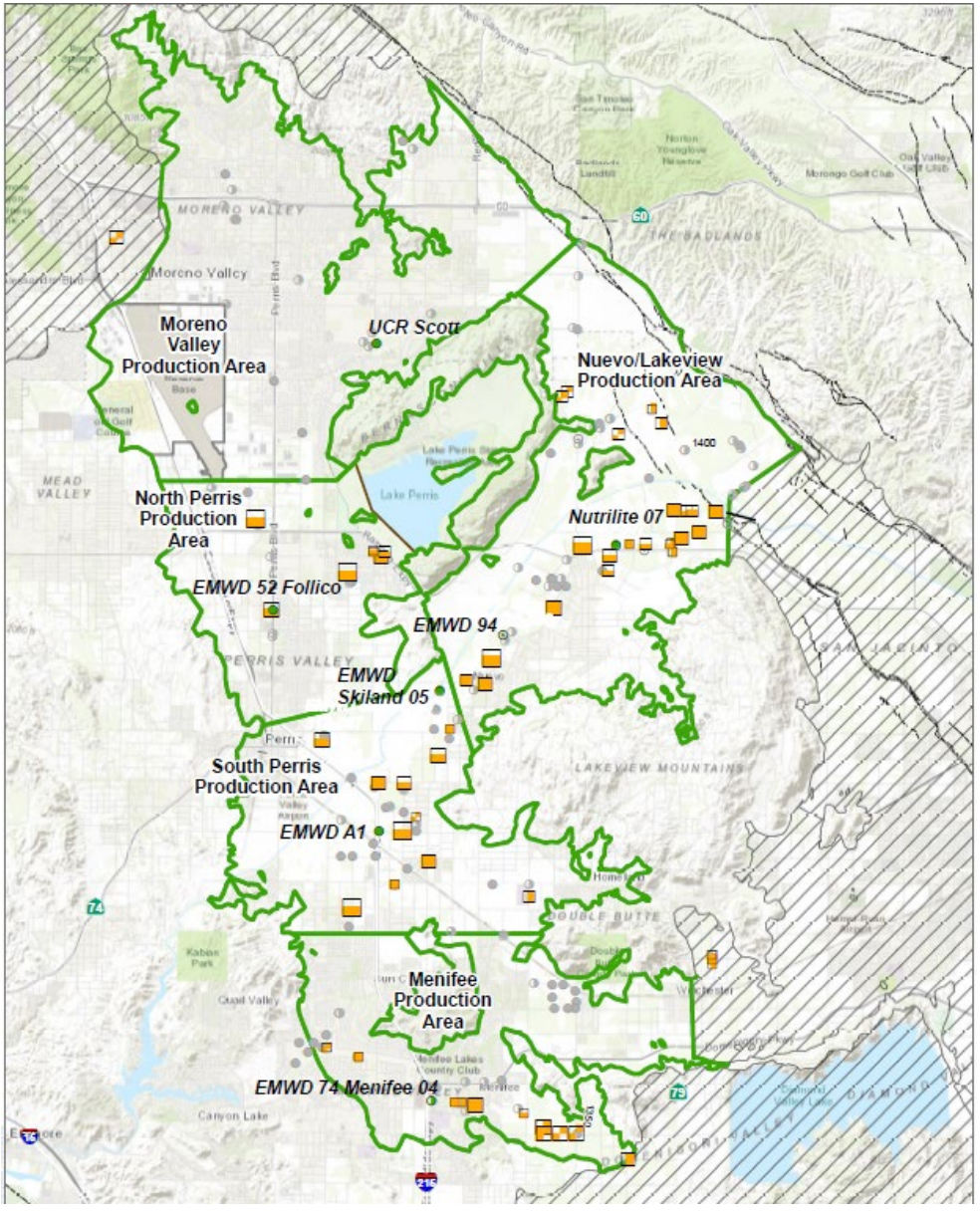
Minimum Thresholds Under SGMA

- The San Jacinto GSP is required to (23 CCR § 354.28):
  - Describe the information and criteria relied upon to justify the minimum threshold (MT) for each sustainability indicator
    - Today's focus is groundwater elevation and groundwater in storage
  - Justify the value for the MT
    - Use information described in the basin setting
    - Data qualified by uncertainty in understanding the basin setting
    - Models qualified by uncertainty in the understanding of the basin setting
  - Describe how the MTs have been selected to *avoid undesirable results*

Undesirable Results Under SGMA

Representative Monitoring Wells in the Plan Area

- Menifee
  - EMWD 74 Menifee 04
- South Perris
  - EMWD Skiland 05
  - EMWD A1
- Nuevo/Lakeview
  - EMWD 94
  - Nutrilite 07
- North Perris
  - EMWD 52 Follico
- Moreno Valley
  - UCR Scott

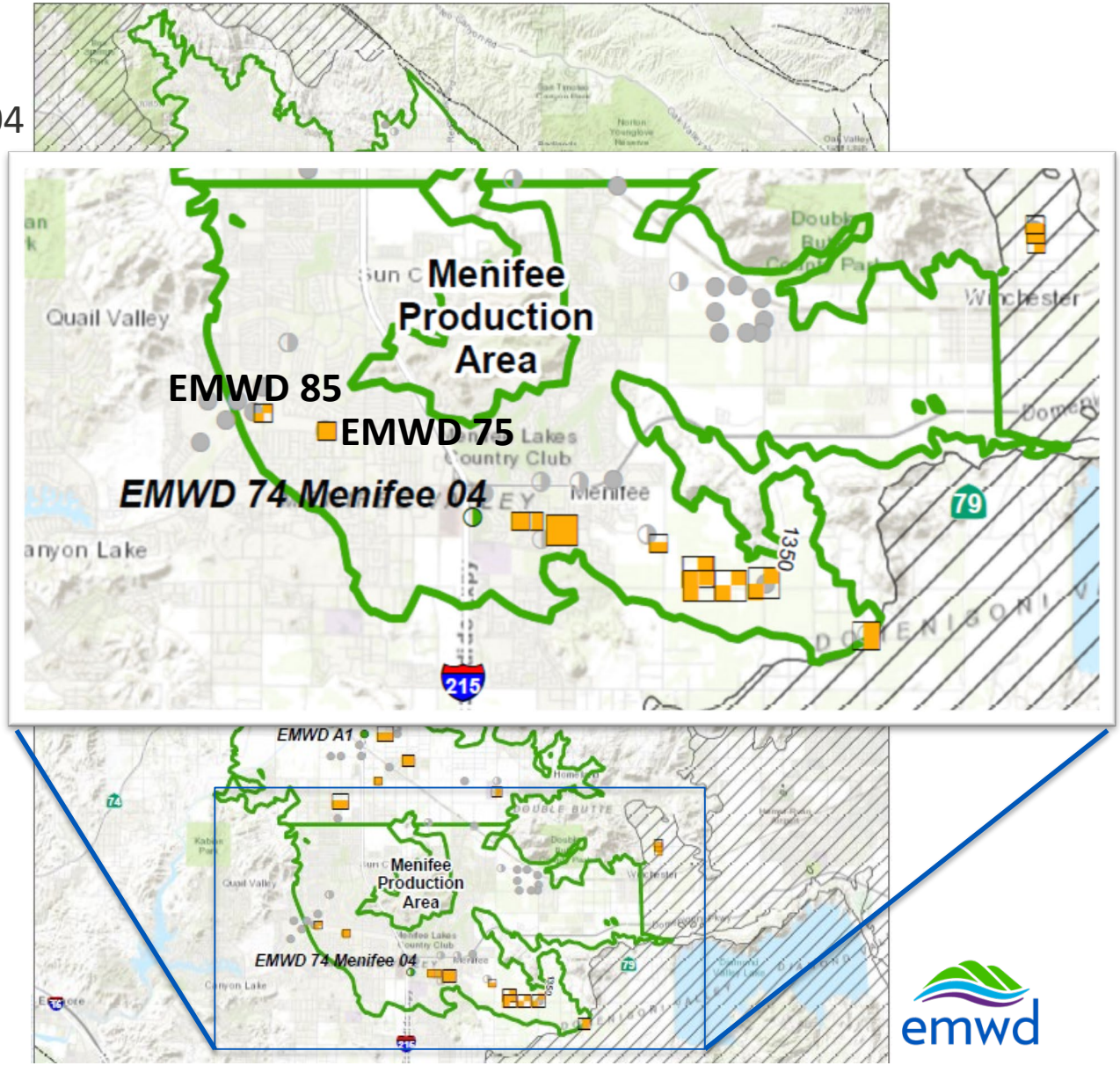


Evaluation Criteria for Proposed MTs

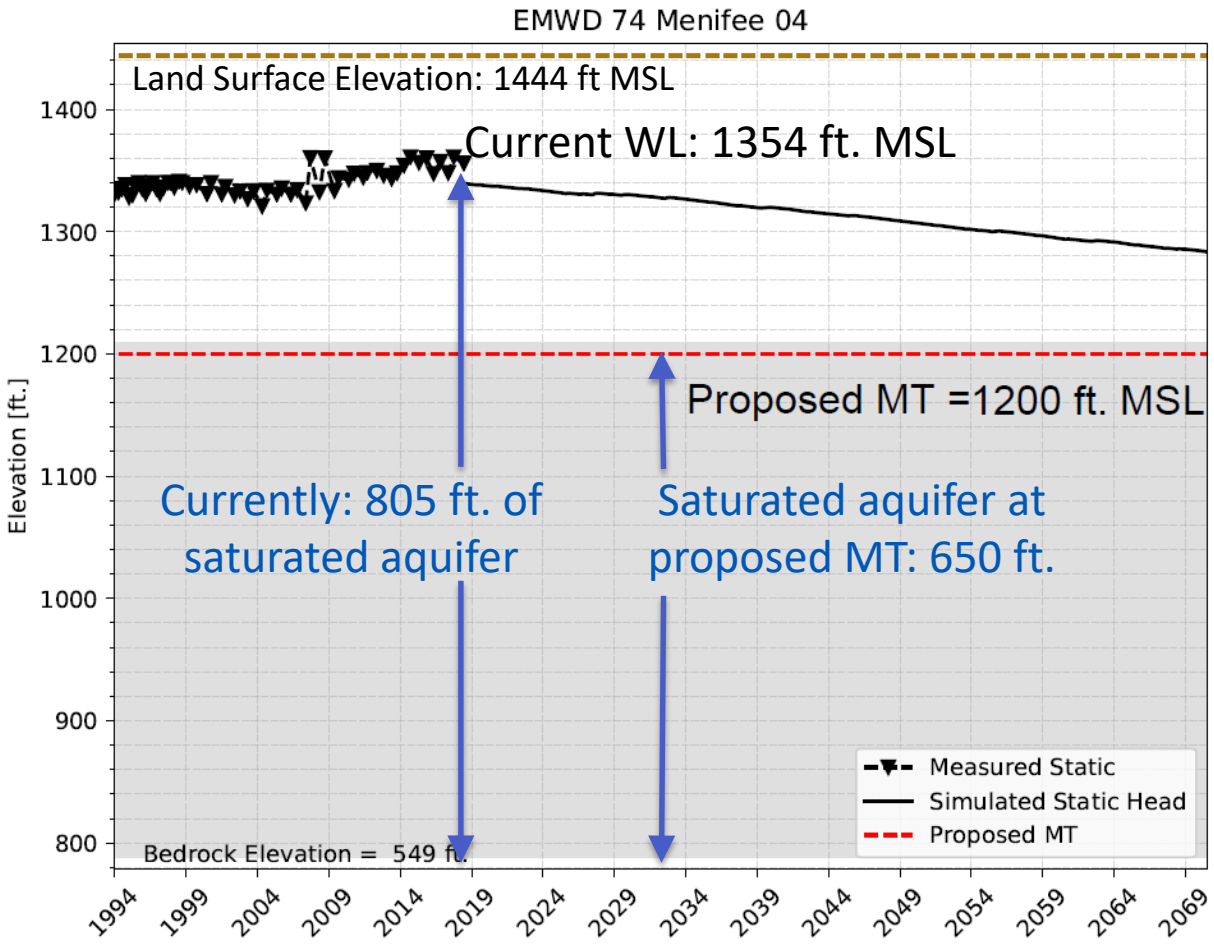
- Hydrogeologic considerations:
  - Trends in historical groundwater elevations
  - Local saturated thickness of the aquifer
  - Basin-wide saturated thickness of the aquifer
- EMWD and Stakeholder Operational Considerations:
  - Static groundwater elevations relative to screen intervals at nearby production wells
  - Pumping groundwater elevations at nearby production wells
  - Ability to meet operational demands
  - Ability to lower pump intakes if necessary
  - Ability/ willingness to deepen wells if necessary
- Consideration of modeled potential future groundwater elevations

Menifee Production Area

- Menifee
  - EMWD 74 Menifee 04
- South Perris
  - EMWD Skiland 05
  - EMWD A1
- Nuevo/Lakeview
  - EMWD 94
  - Nutrilite 07
- North Perris
  - EMWD 52 Follico
- Moreno Valley
  - UCR Scott



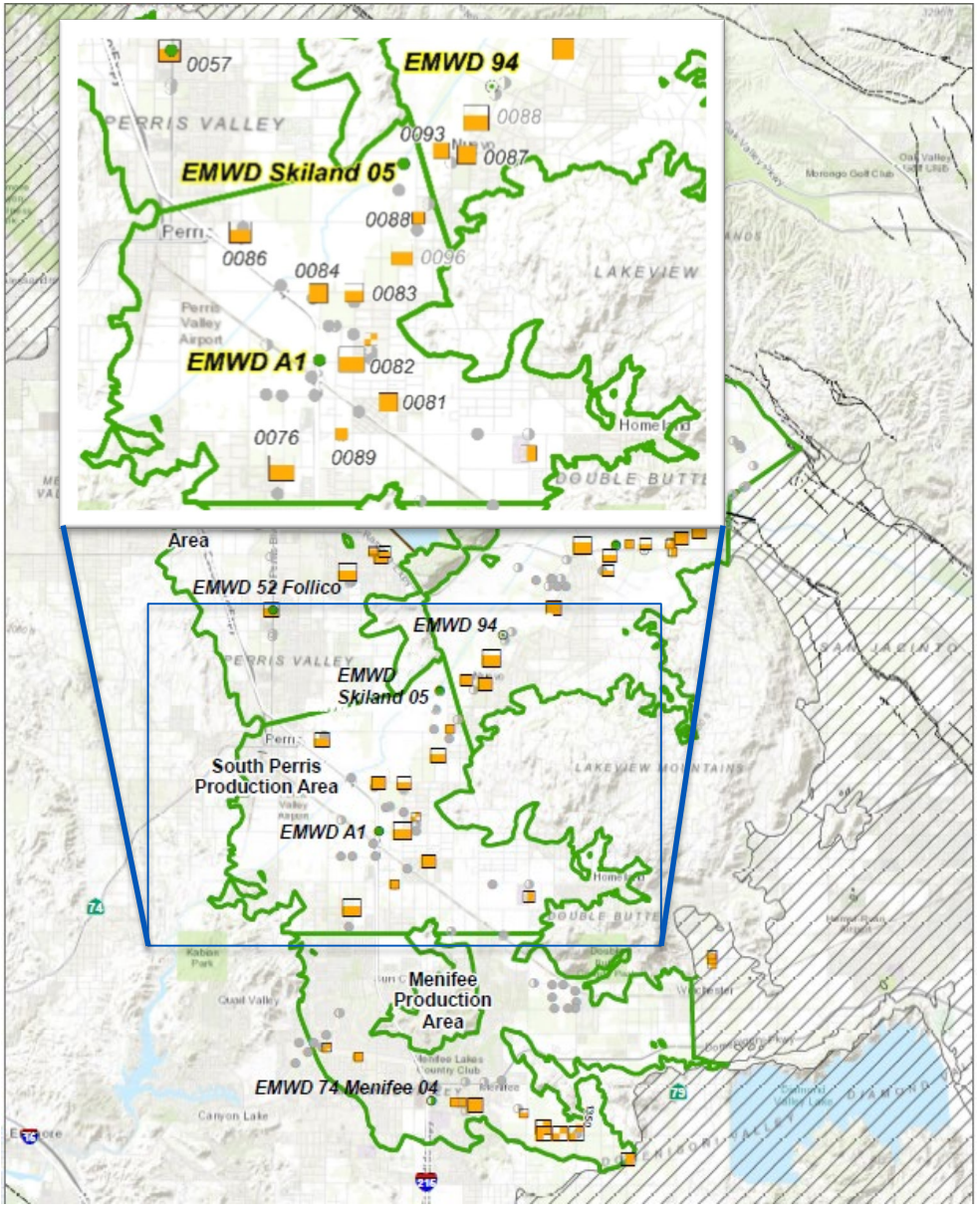
Proposed MT at EMWD 74



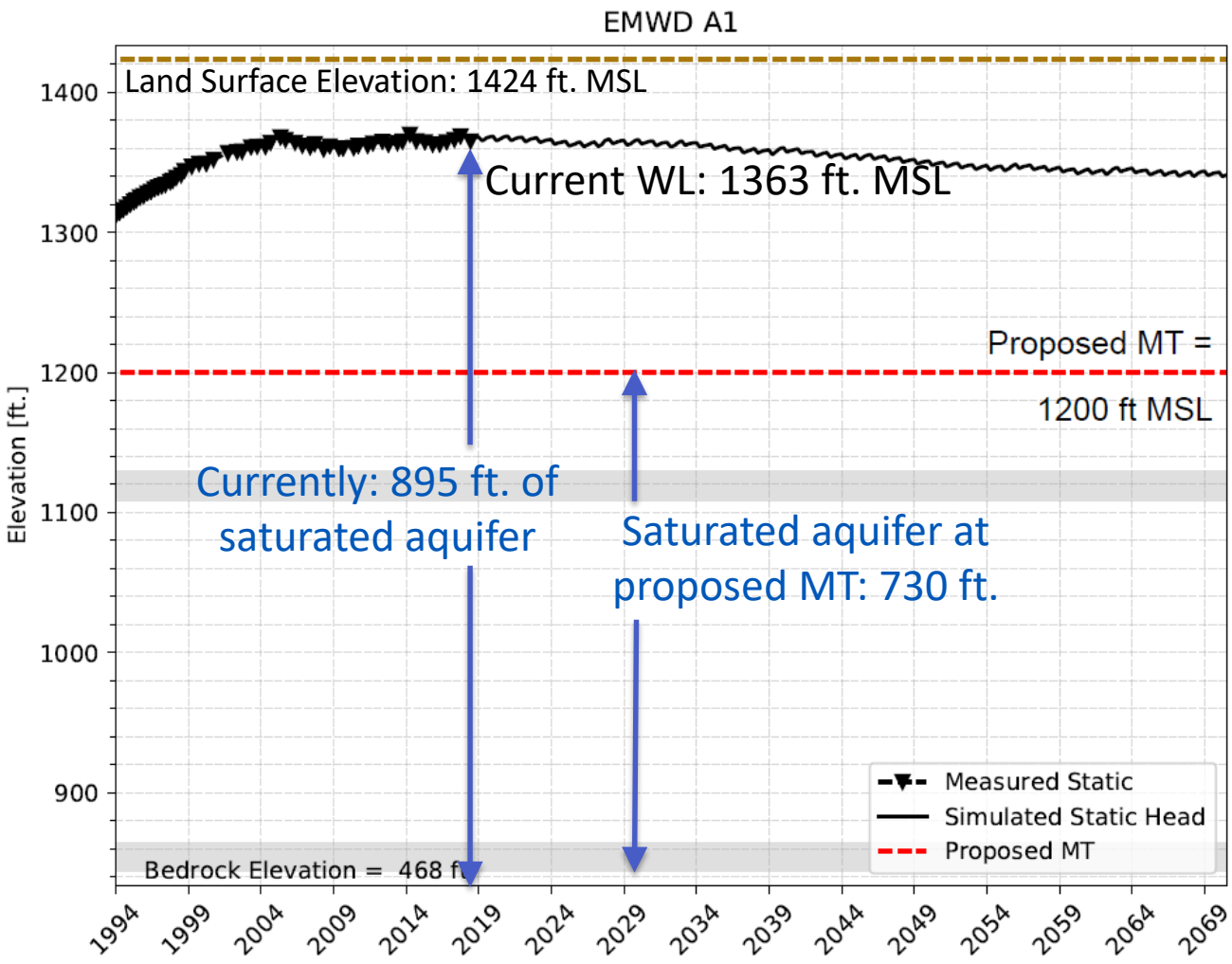
- Proposed minimum threshold = 1200 ft. MSL.
- Protects EMWD operational flexibility
- Limits long-term decline in groundwater elevation and storage
- Maintains average aquifer saturation > 60% in the Menifee Production Area

South Perris Production Area

- Menifee
  - EMWD 74 Menifee 04
- South Perris
  - EMWD Skiland 05
  - EMWD A1
- Nuevo/Lakeview
  - EMWD 94
  - Nutrilite 07
- North Perris:
  - EMWD 52 Follico
- Moreno Valley
  - UCR Scott

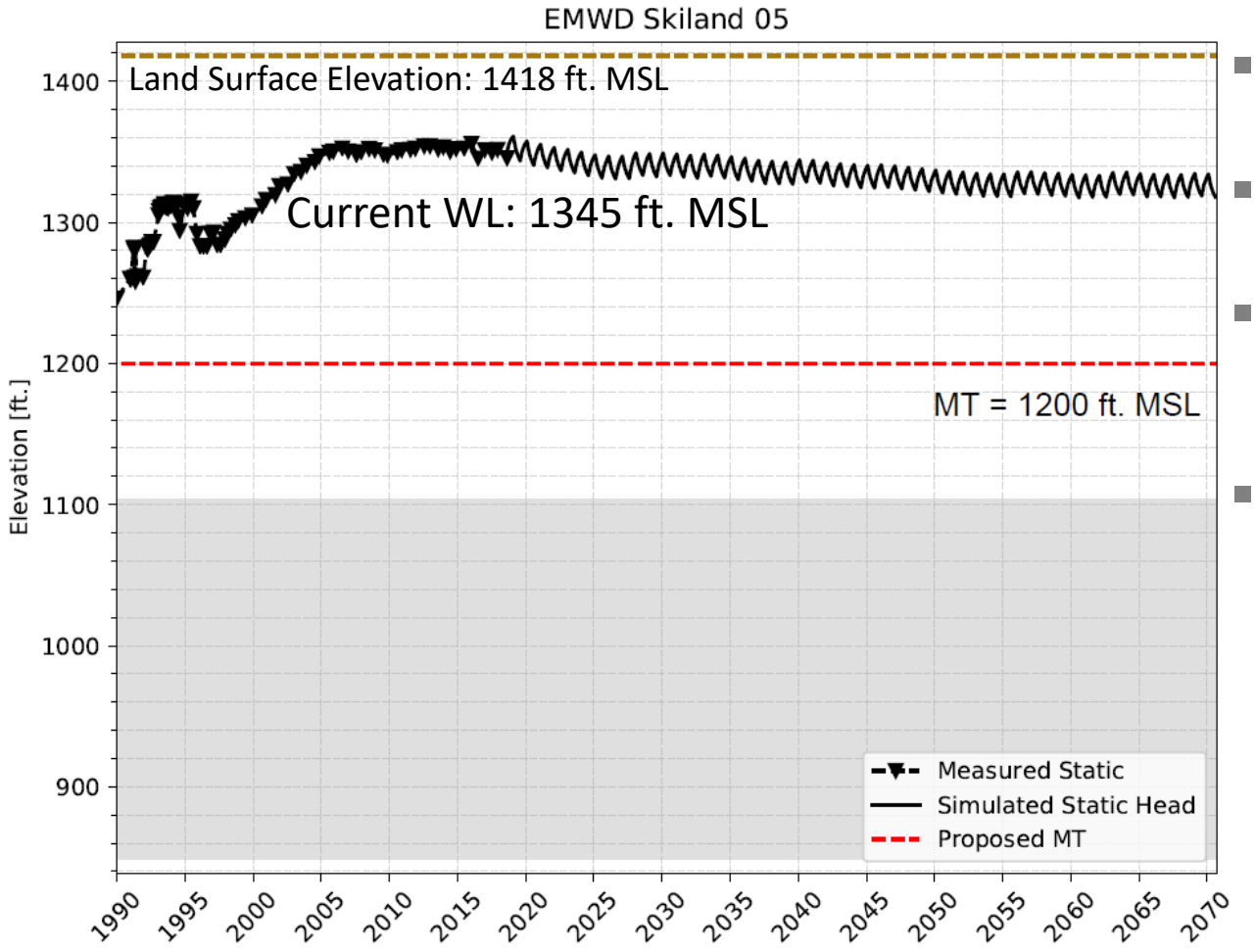


Proposed MT at EMWD A1



- Proposed minimum threshold = 1200 ft. MSL.
- Protects EMWD operational flexibility
- Limits long-term decline in groundwater elevation and storage
- Maintains average aquifer saturation > 70%

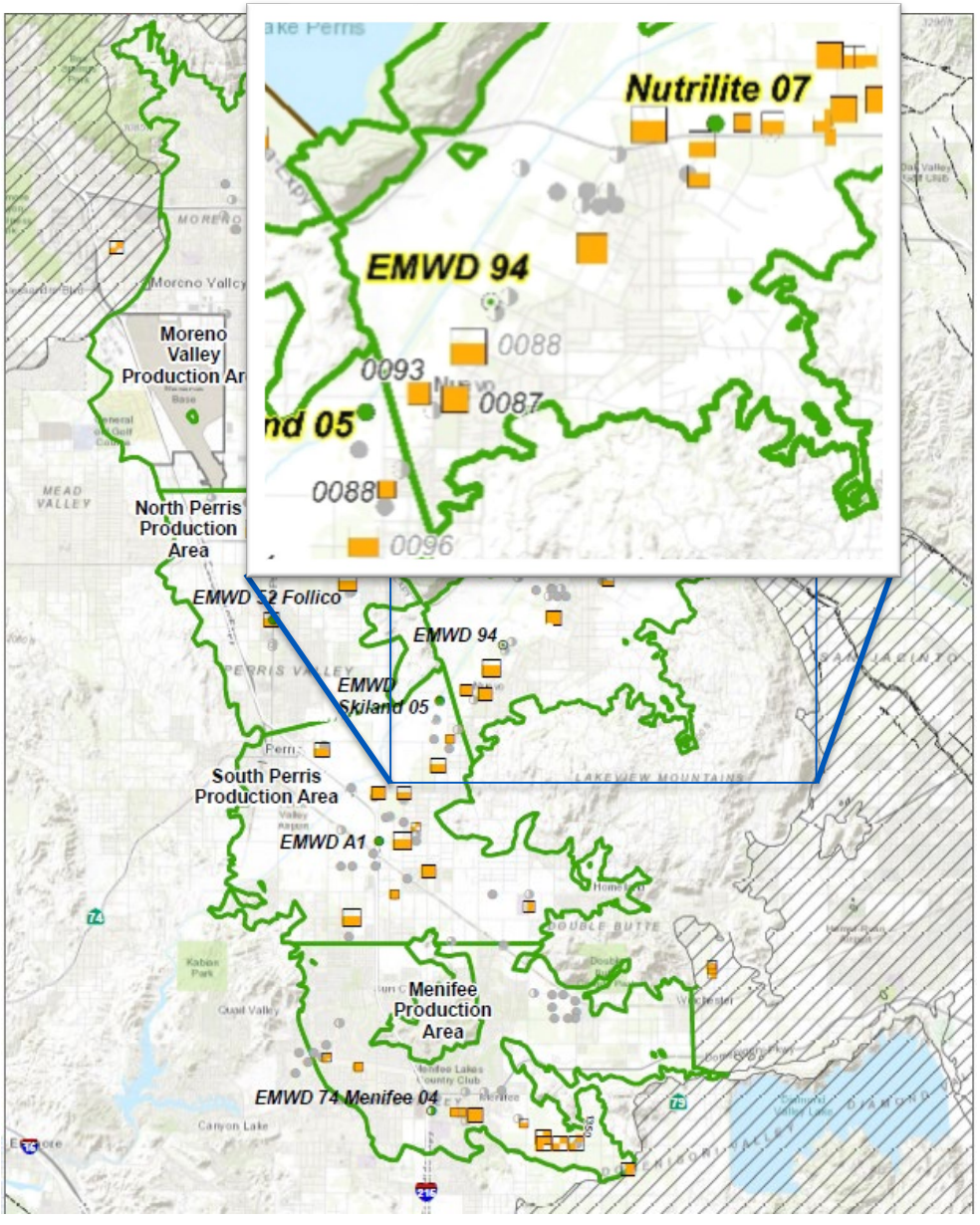
Representative Monitoring Well Skiland 05



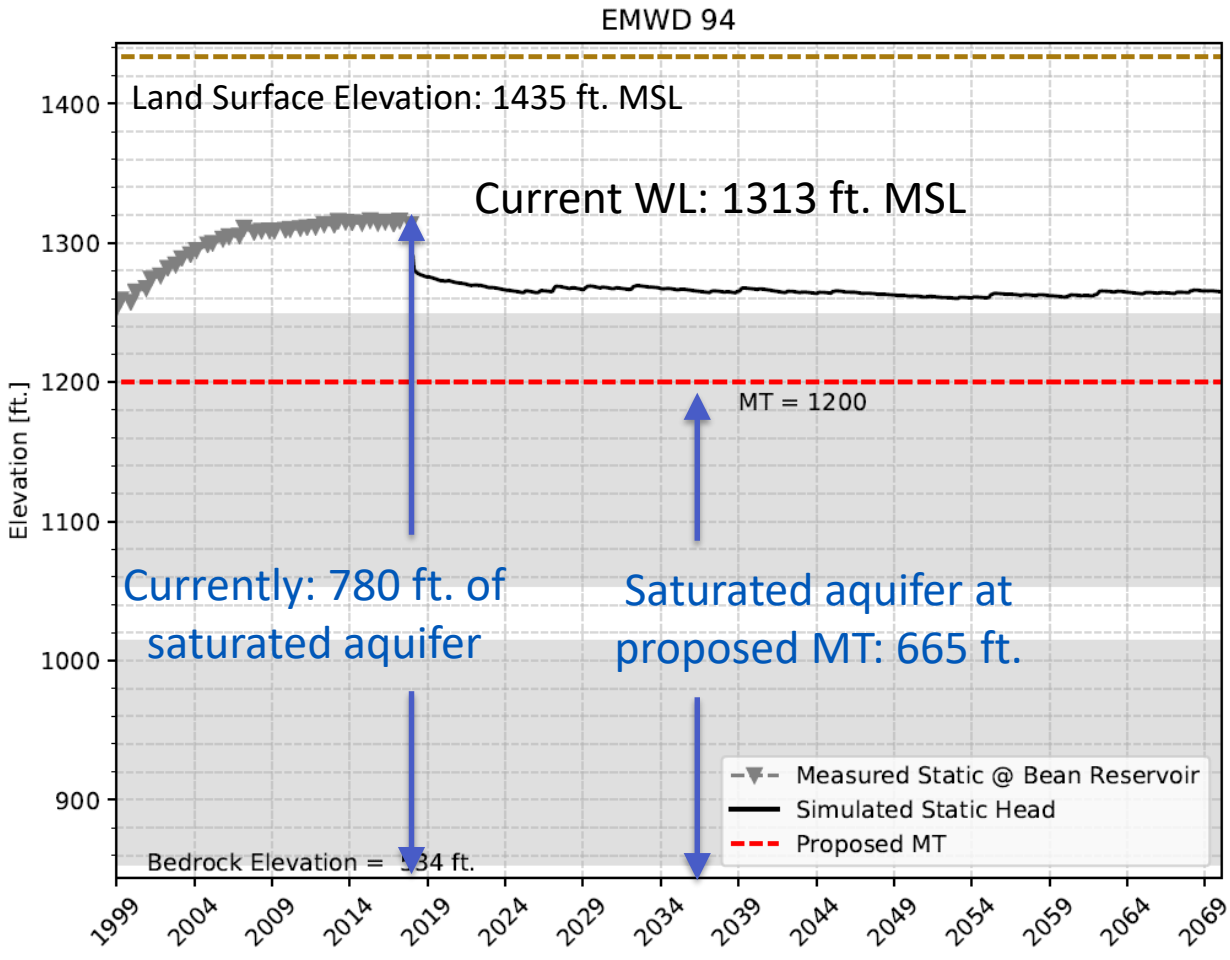
- Proposed minimum threshold = 1200 ft. MSL.
- Protects EMWD operational flexibility
- Limits long-term decline in groundwater elevation and storage
- Maintains average aquifer saturation > 70% in the South Perris Production Area

Nuevo/Lakeview Production Area

- Menifee
  - EMWD 74 Menifee 04
- South Perris
  - EMWD Skiland 05
  - EMWD A1
- Nuevo/Lakeview
  - EMWD 94
  - Nutrilite 07
- North Perris:
  - EMWD 52 Follico
- Moreno Valley
  - UCR Scott

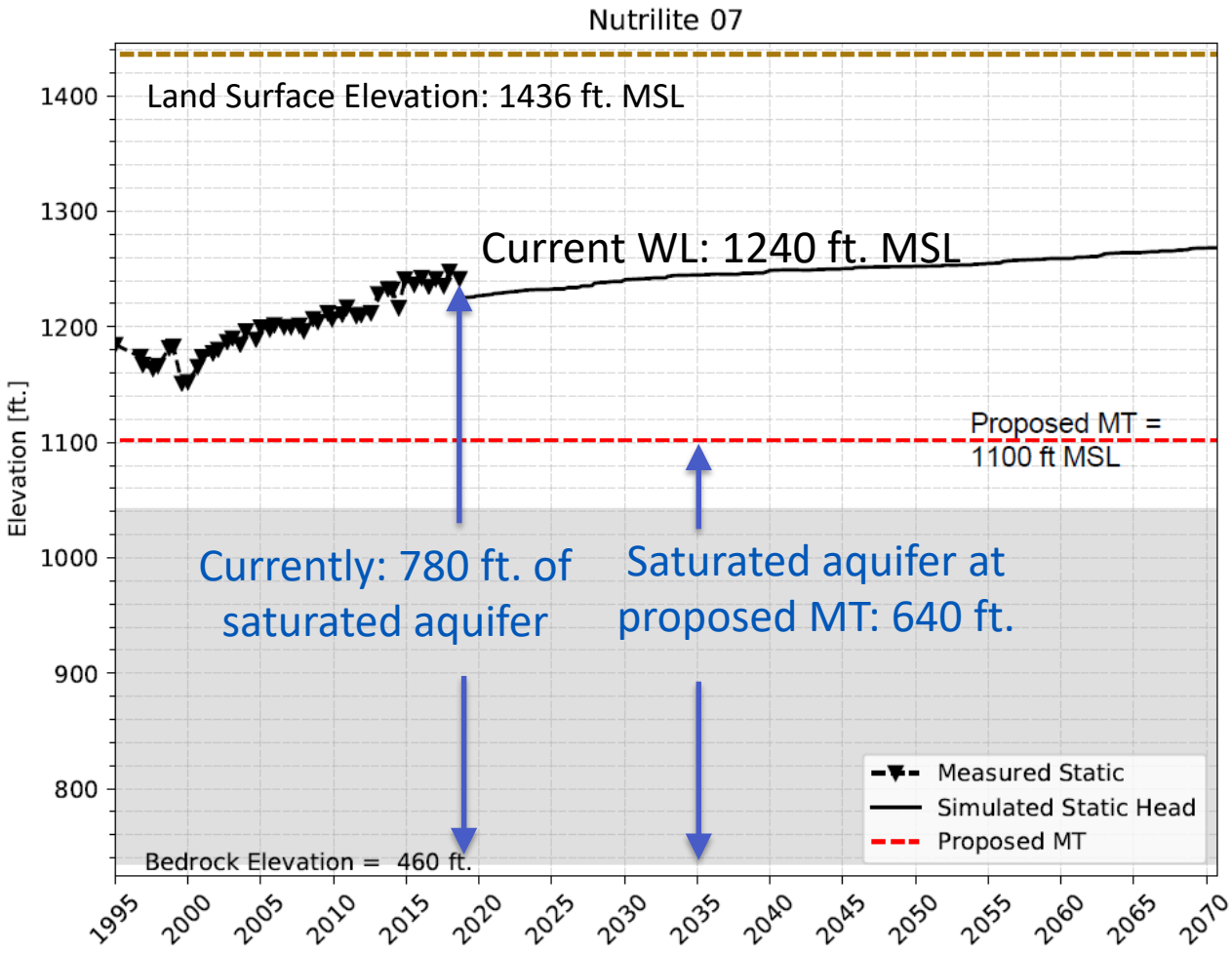


Representative Well EMWD 94



- EMWD 94 is a production well
- Current WL is from nearby well
- Future WLs anticipated to decline initially and then stabilize
- Proposed Minimum Threshold – 1200 ft MSL
- > 70% aquifer saturation

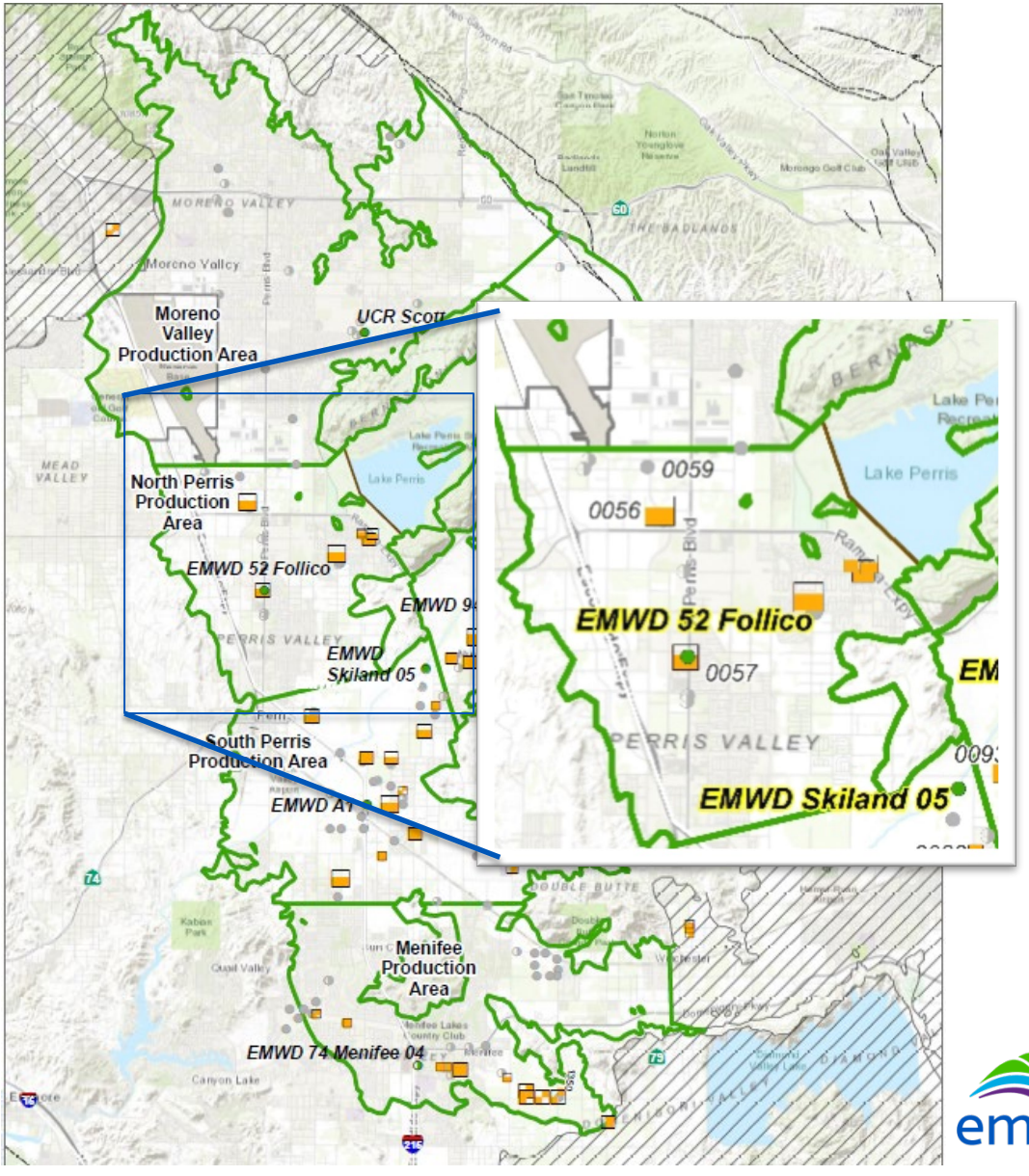
Representative Monitoring Well Nutrilite 07



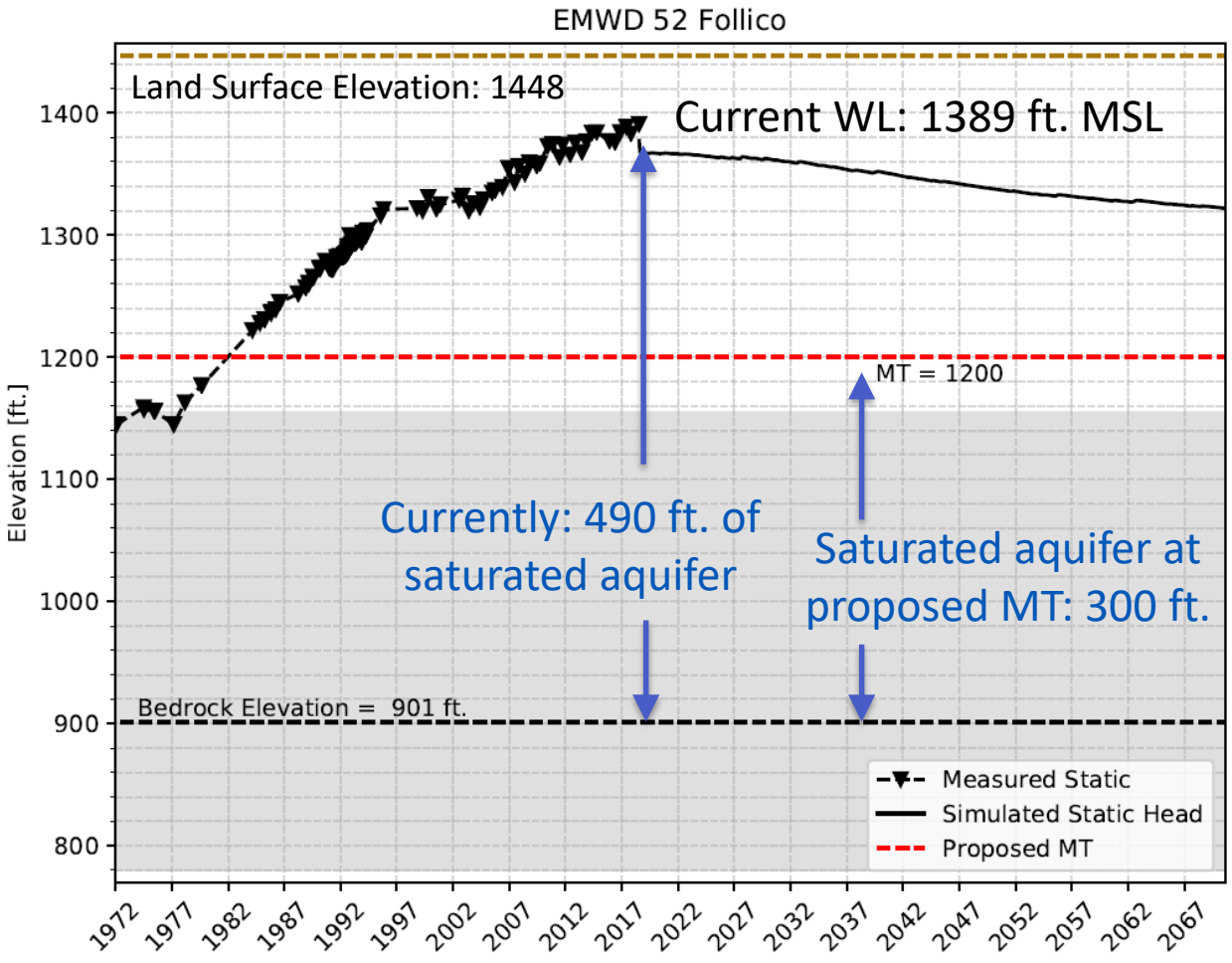
- Nutrilite 07 is a monitoring well
- Future groundwater elevations not well characterized
- Historical water levels have been as low as 1150 ft MSL
- Proposed MT = 1100 ft MSL
  - 140 feet lower than current WL
- >70% aquifer saturation

North Perris Production Area

- Menifee
  - EMWD 74 Menifee 04
- South Perris
  - EMWD Skiland 05
  - EMWD A1
- Nuevo/Lakeview
  - EMWD 94
  - Nutrilite 07
- North Perris:
  - EMWD 52 Follico
- Moreno Valley
  - UCR Scott



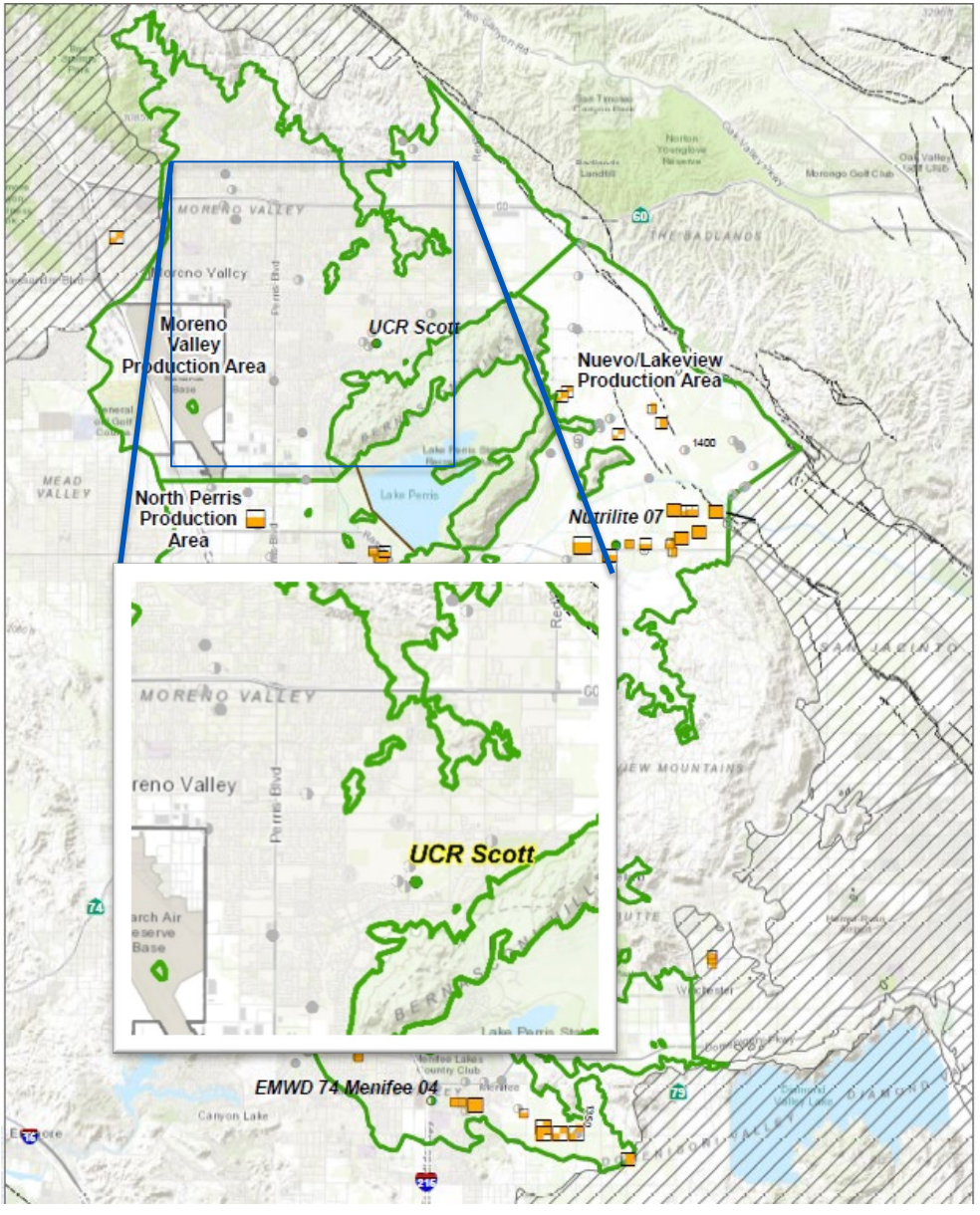
Representative Monitoring Well EMWD 52



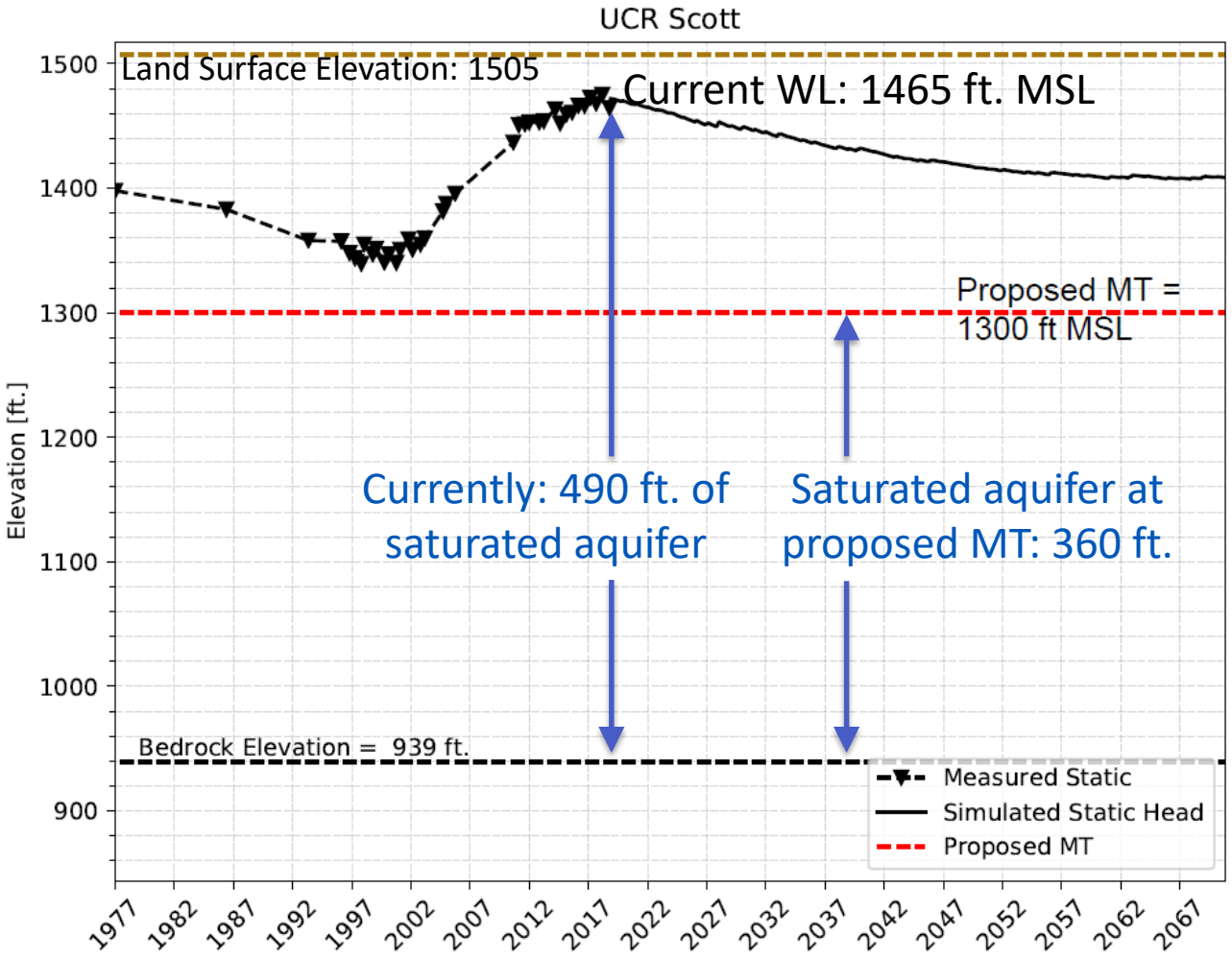
- EMWD 52 is a monitoring well
- Future WLs anticipated to decline
- Proposed Minimum Threshold – 1200 ft. MSL
- Preserves >60% aquifer saturation in North Perris Production Area

Moreno Valley Production Area

- Menifee
  - EMWD 74 Menifee 04
- South Perris
  - EMWD Skiland 05
  - EMWD A1
- Nuevo/Lakeview
  - EMWD 94
  - Nutrilite 07
- North Perris:
  - EMWD 52 Follico
- Moreno Valley
  - UCR Scott



Representative Monitoring Well UCR Scott



- Proposed MT lower than historical low water level
- Preserves saturation of >60% at UCR Scott

Summary

- Followed DWR guidance to propose *water level and groundwater in storage* minimum thresholds at each representative monitoring point
  - Reviewed:
    - Historical data
    - Impacts to other sustainability indicators (subsidence, water quality, groundwater dependent ecosystems)
    - Potential impacts to existing EMWD wells
    - Potential future water levels based on planned future operations

Summary

- Followed DWR guidance to propose *water level and groundwater in storage* minimum thresholds at each representative monitoring point

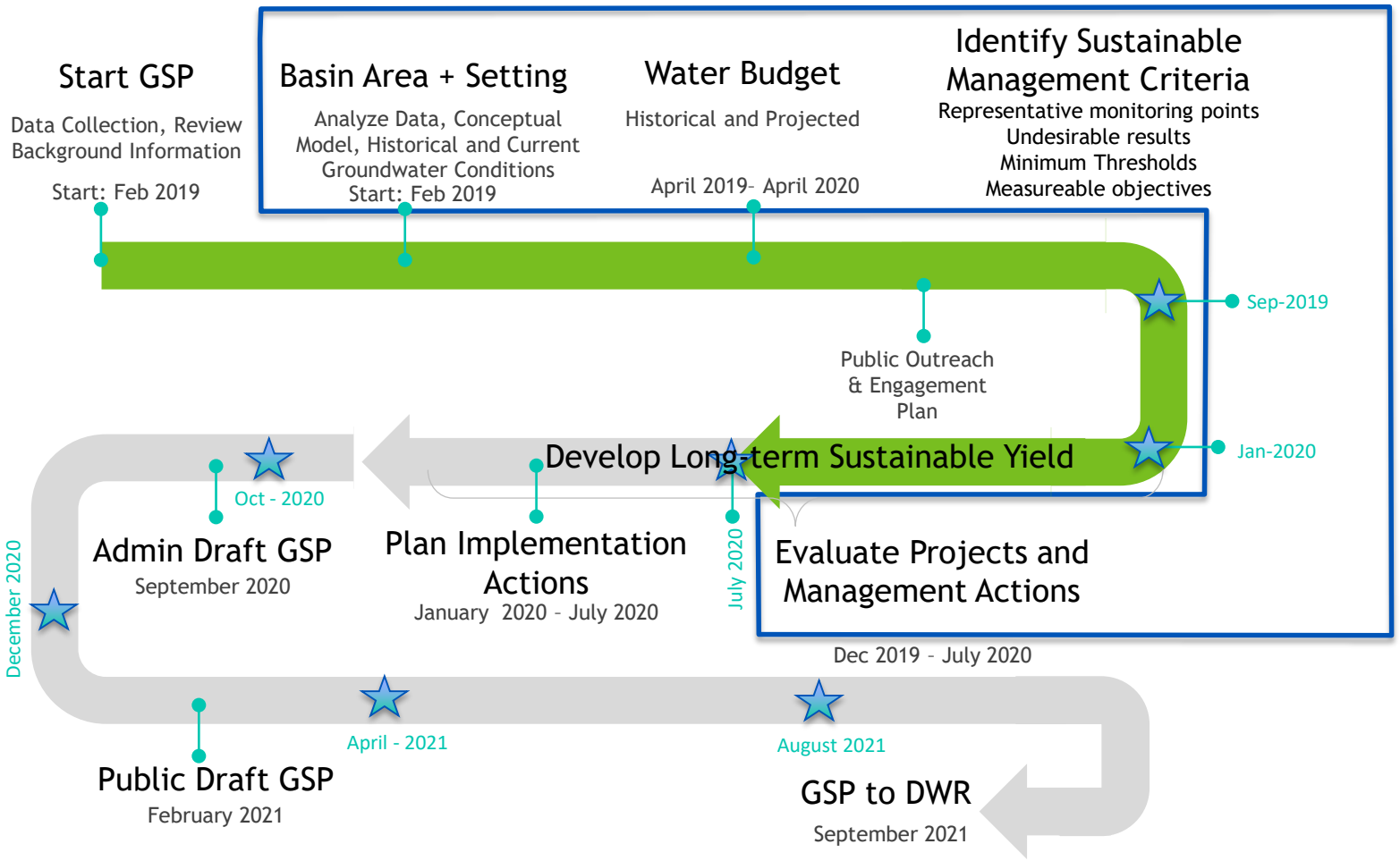
RMP	Proposed MT (ft MSL)	Operational Flexibility (ft)	Aquifer Saturation % at Proposed MT	MT At or Above Historical Low WL?
EMWD 74	1200	154	>60%	NO
EMWD A1	1200	163	>70%	NO
EMWD Skiland 05	1200	145	>70%	NO
EMWD 94	1200	113	>70%	NO
Nutrilite 07	1100	140	>70%	NO
EMWD 52	1200	190	>60%	YES
UCR Scott	1300	165	Varies From North to South (<10% to >60%)	NO

Next Steps

- Incorporate feedback from this group
- Develop measurable objectives
  - Based on EMWD operational objectives

Timeline and Next Steps

GSP Development Process



Next Steps

- EMWD and consultant team will continue to work together to:
  - Conduct additional groundwater budget analysis
    - Evaluate the future water budget
    - Evaluate the water budget of the east side of the San Jacinto Groundwater Basin
  - Continue to define sustainable management criteria
    - Measurable objectives
  - Evaluate potential projects and management actions
- Next stakeholder advisory group meeting scheduled for October 2020

Questions

West San Jacinto Groundwater Sustainability Agency (GSA) Development of the West San Jacinto Groundwater Sustainability Plan (GSP) – October 14, 2020

Rachel Gray

October 14, 2020

Introduction

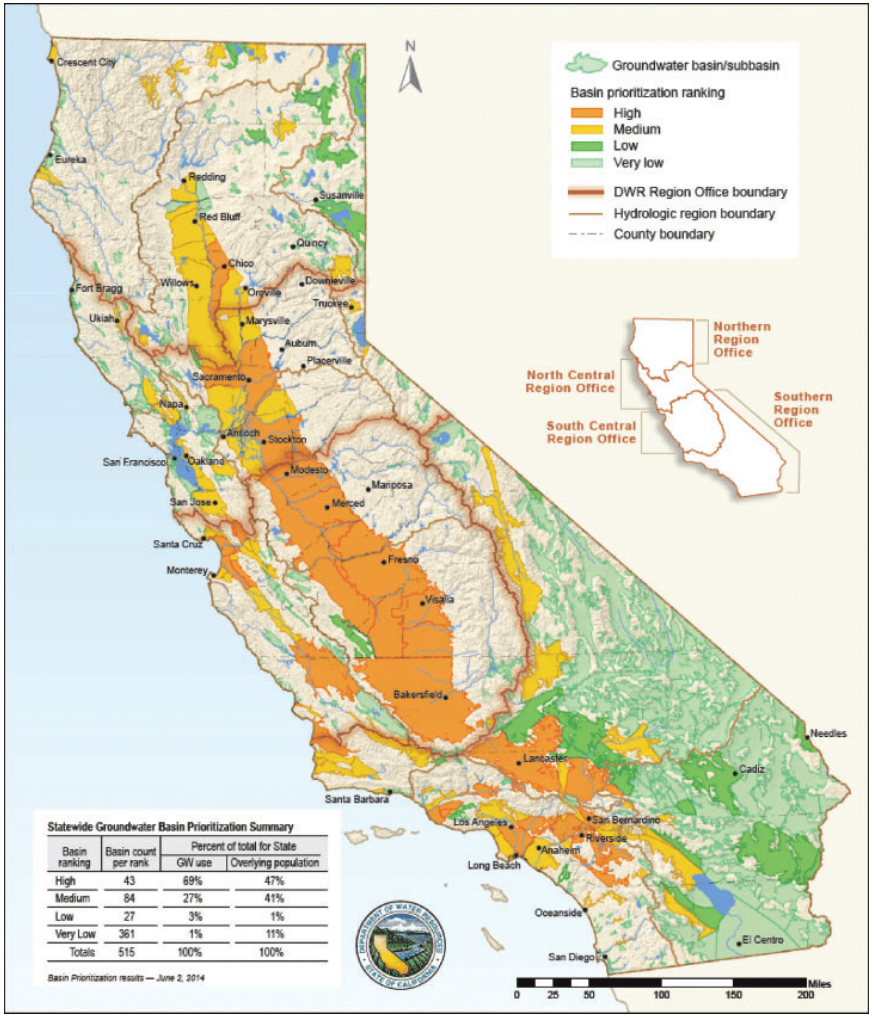
- Project Overview
  - What is the Sustainable Groundwater Management Act?
  - What is a Groundwater Sustainability Plan?
- Update on the Groundwater Sustainability Plan Development
  - Historical, Current, and Projected Baseline Water Budgets for the West San Jacinto GSA Area
  - Minimum Thresholds and Measurable Objectives for Groundwater Quality
  - Undesirable Results
  - Projects and Management Actions
- Timeline and Next Steps
- SGMA Webpage
- Feedback
- Questions and Answers

emwd

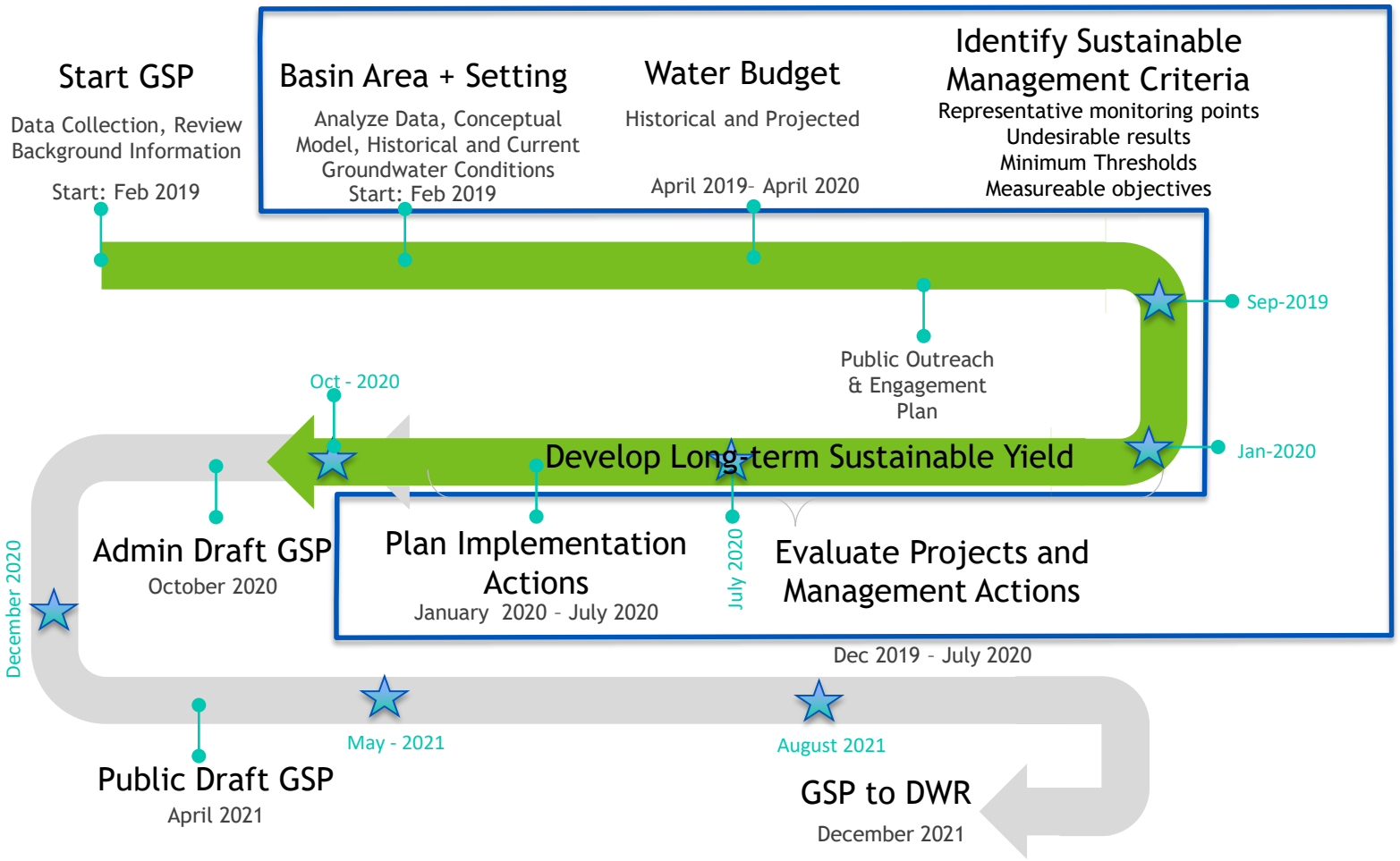
Project Overview

What is the Sustainable Groundwater Management Act?

- Signed September 16, 2014
- Effective January 1, 2015
- Requires:
  - Formation of groundwater sustainability agencies (GSAs) for high and medium priority groundwater basins
  - Preparation of groundwater sustainability plans (GSPs) by 2022
  - Achieve sustainability within 20 years of plan adoption
- "A central tenet of these bills is the recognition that groundwater management is best accomplished locally."
  - Governor Edmund G. Brown Jr.



GSP Development Process



San Jacinto Groundwater Basin

Water Budgets for GSP Development

Ali Taghavi, Ph.D., P.E.
Project Manager

Agenda

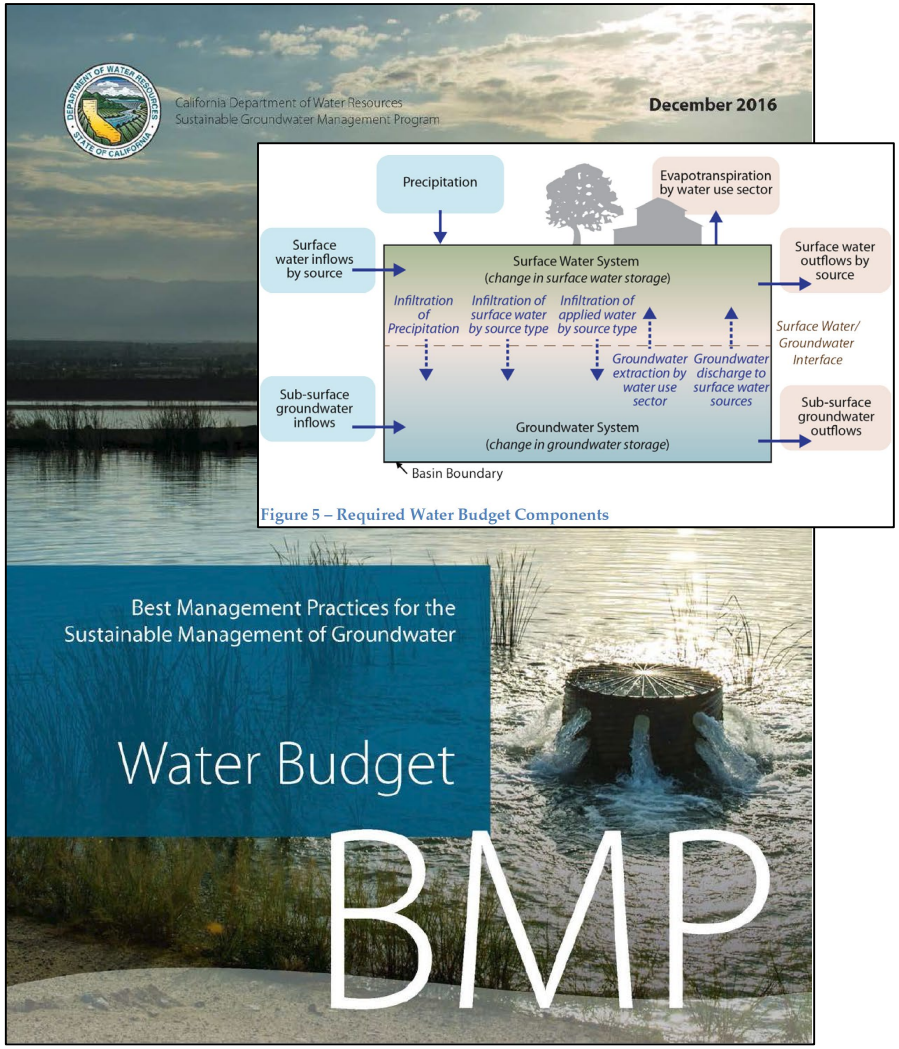
- Water Budget Background

- Water Budget Development for:
  - Historical Conditions
  - Current Conditions
  - Projected Baseline Conditions

Water Budgets Background

DWR's Water Budget Best Management Practices

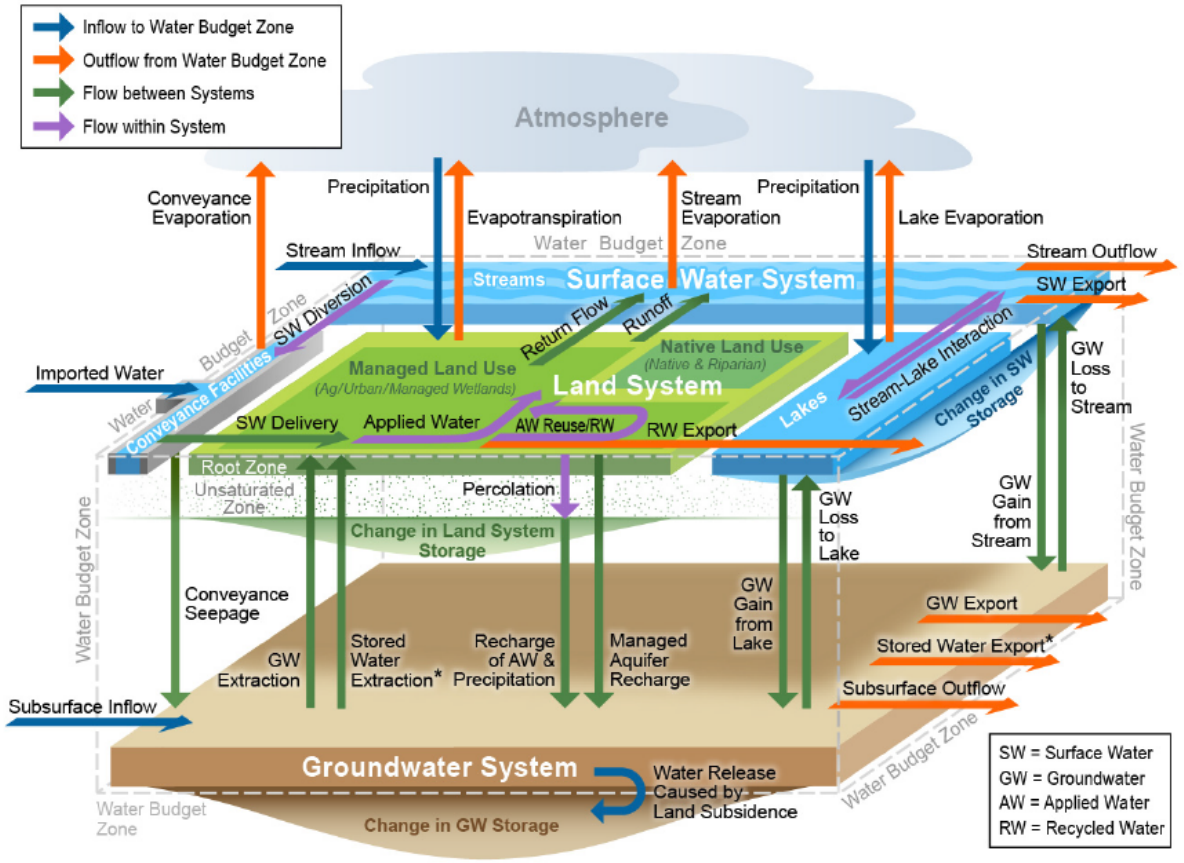
- Water Budgets provide an accounting and assessment of the total annual volume of groundwater and surface water entering and leaving the basin.
- Water budget information shall be reported in tabular and graphical form.
- Water Budgets should provide an understanding of historical and projected:
  - hydrology
  - water demand
  - water supply
  - land use
  - population
  - climate change
  - groundwater and surface water interaction
  - subsurface groundwater flow



DWR's Water Budget Handbook

- The Water Budget Handbook is not prescriptive in what methods an agency should apply and does not impose requirements as to how water budgets should be developed for any compliance purposes.
- It serves as a technical resource that provides information on a suite of methods and data sources.

Figure 1-1 Total Water Budget Schematic



Water Budget: Defining Time Frames

Historical

Uses historical information for hydrology, precipitation, water supply and demand, and land use during a minimum of 10 years.

Current Conditions

Holds constant the most recent or "current" data on population, land use, year type, water supply and demand, and hydrologic conditions.

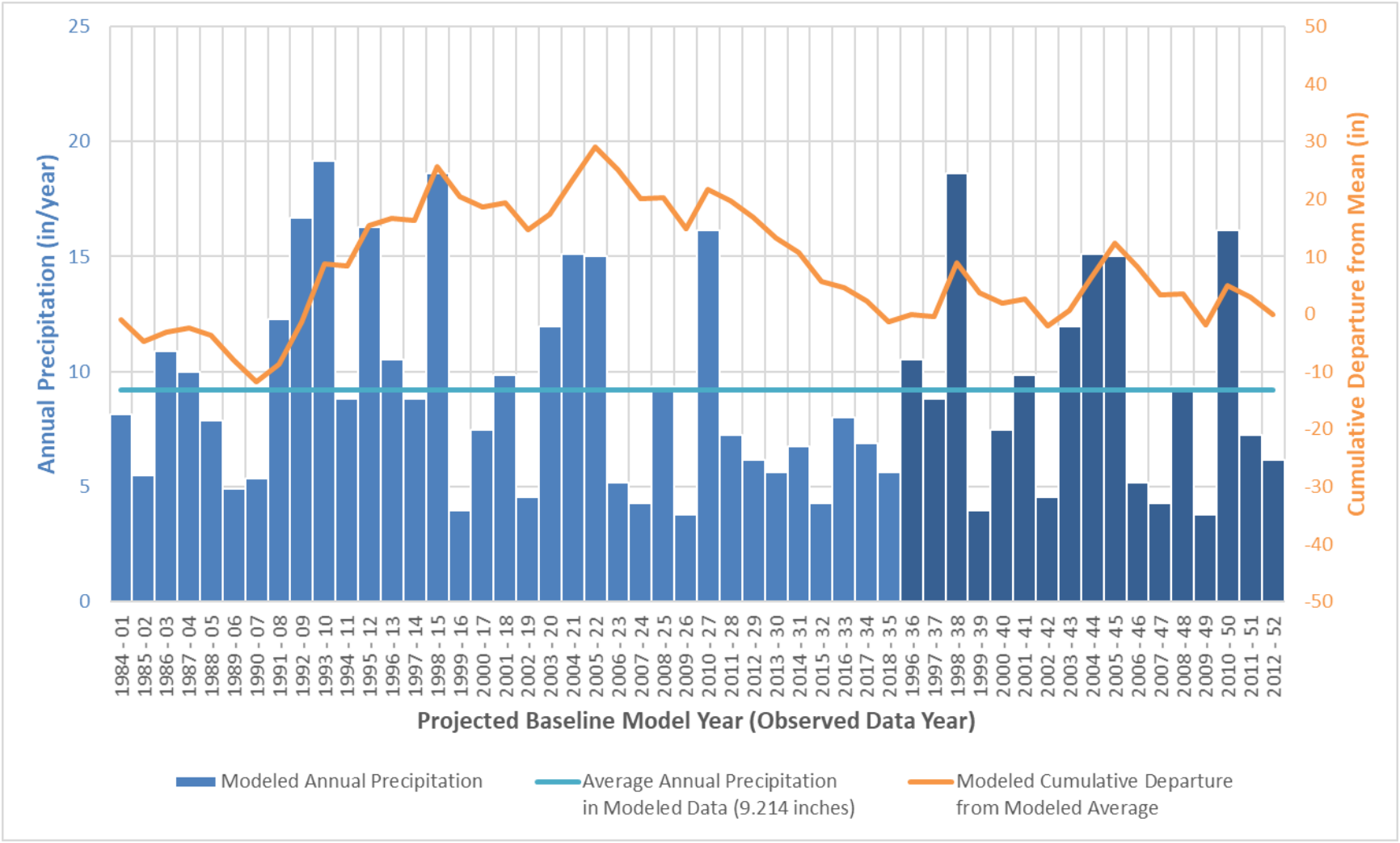
Projected Conditions

Uses a 50-year projected planning horizon to estimate population growth, land use changes, water supply conditions, climate change, etc.

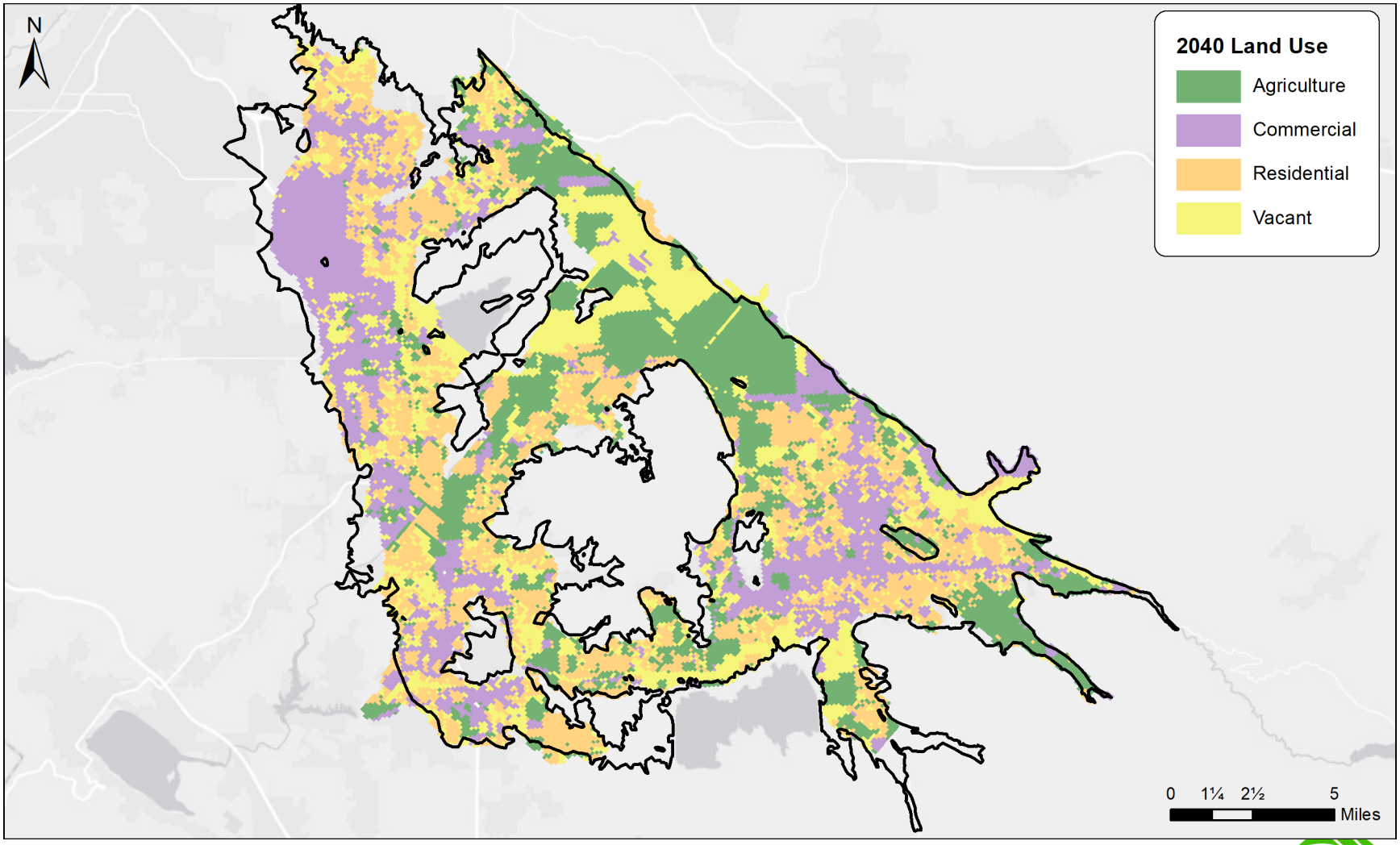
Water Budget Assumptions

- Period of Analysis
  - Historical Conditions: WY 1984 – 2012
  - Current Conditions: WY 2013-2018
  - Projected Conditions: WY 2019-2072
- Land Use Conditions
- Recharge Sources
  - Precipitation
  - Irrigation
  - EMWD water sales
  - Sub-agency water sales
  - Reclaimed Water facilities
  - Recycled water sales
- Groundwater Productions
- Projected Baseline Conditions Include Additional Planned Projects:
  - Perris North Contamination Remediation Program
  - Perris South Desalter II
  - DWR's Lake Perris Seepage Recovery

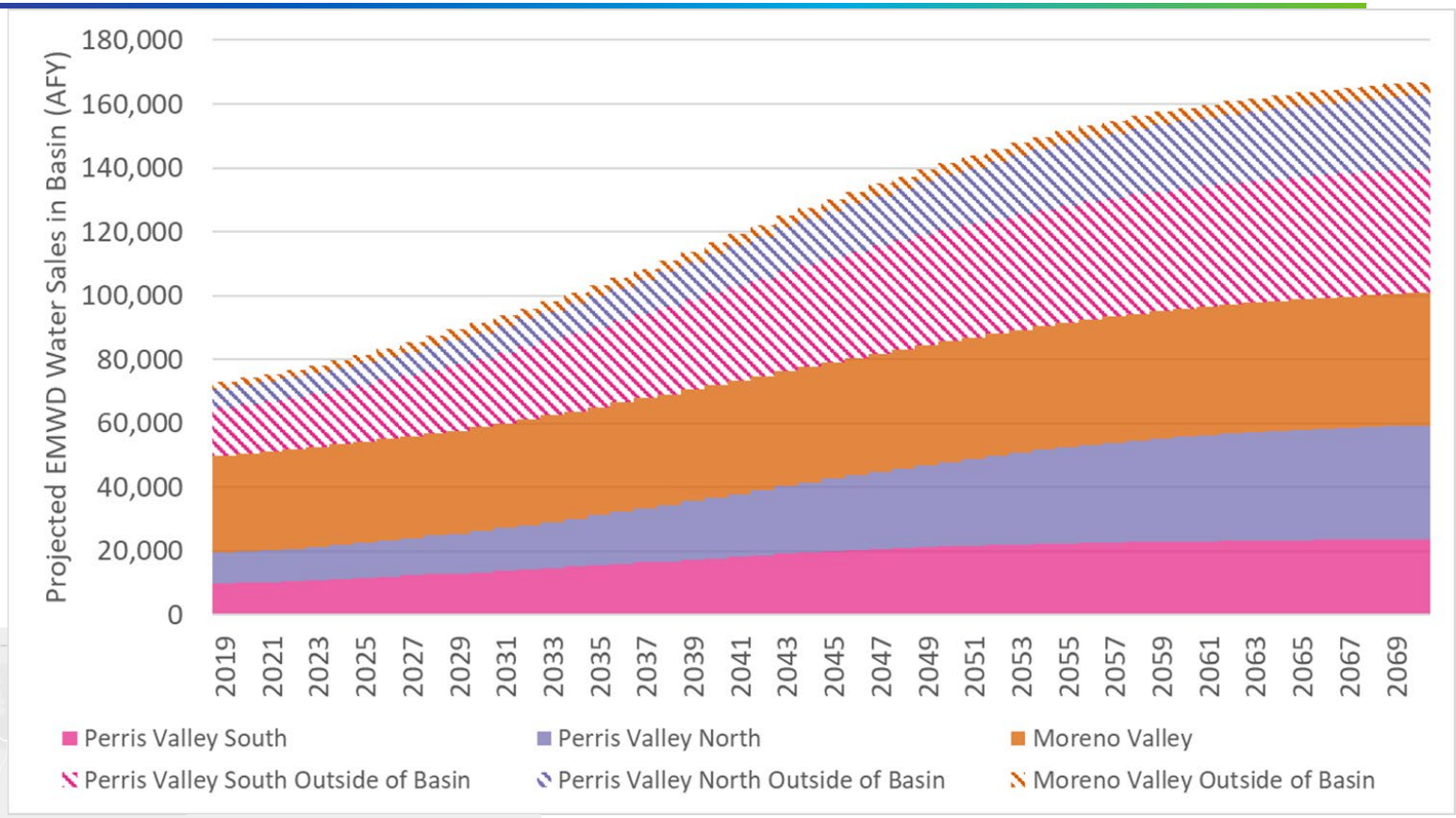
Precipitation Conditions

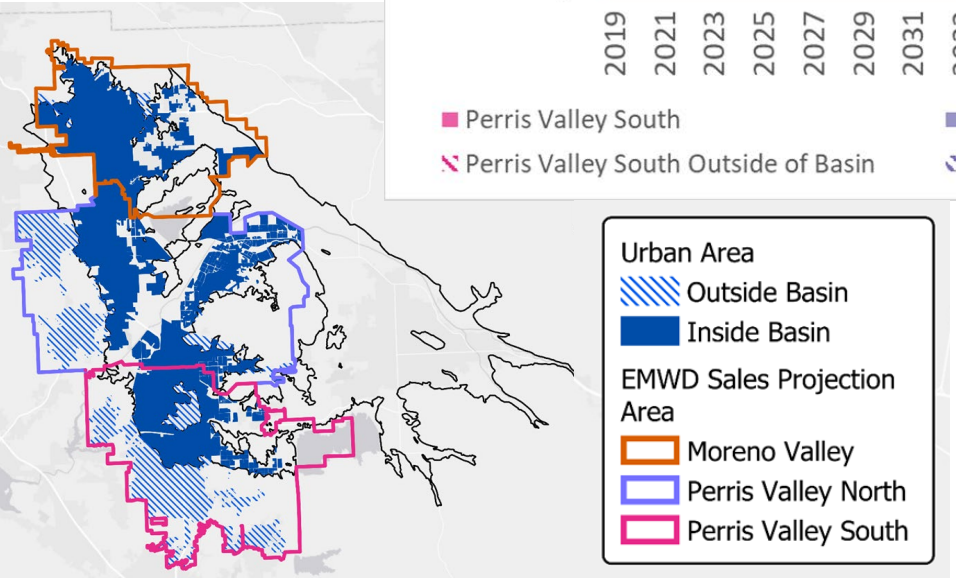


Land Use Conditions

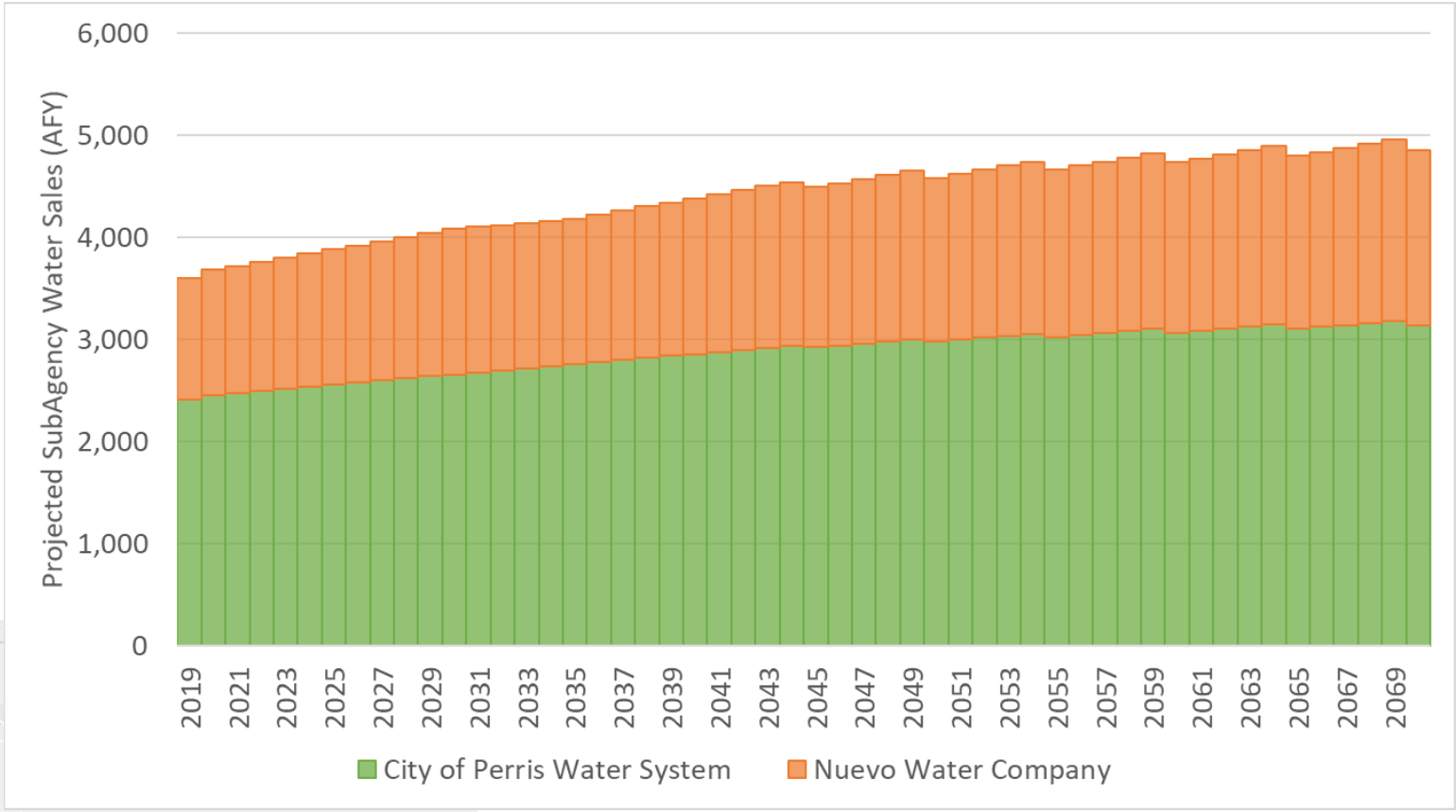


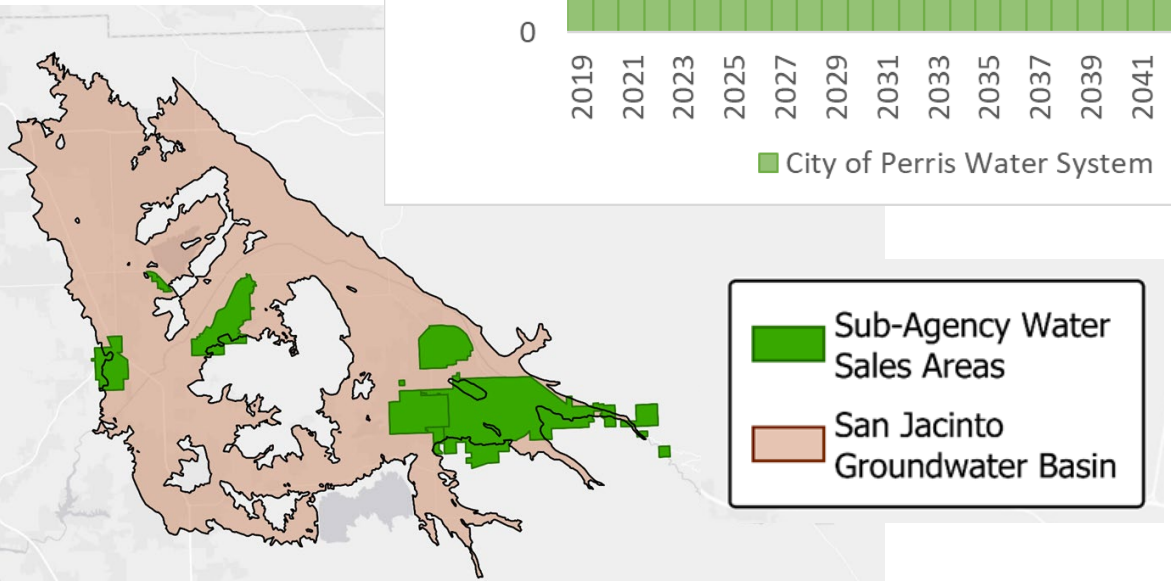
EMWD Water Sales Deliveries





Sub-Agency Water Sales





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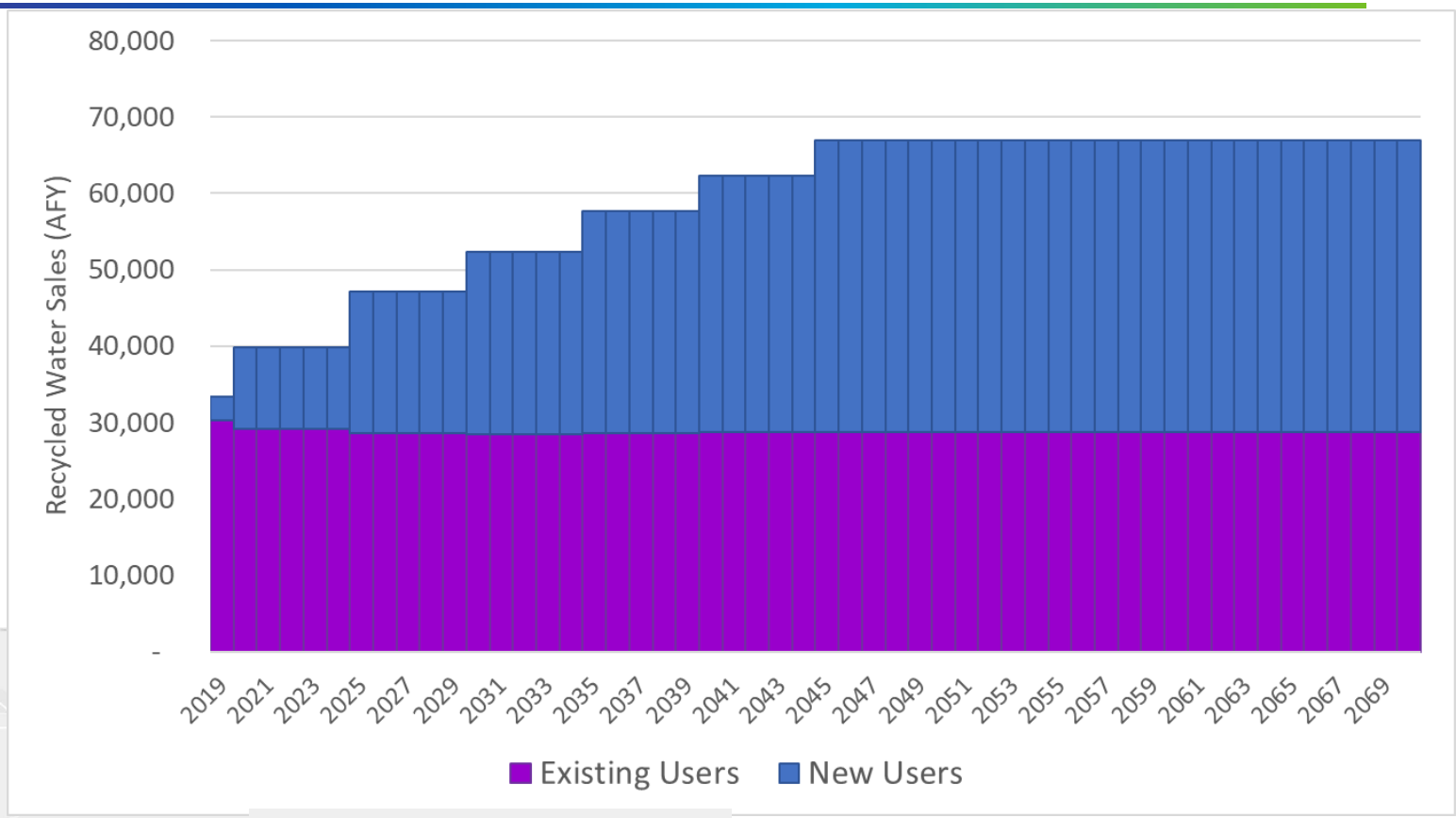
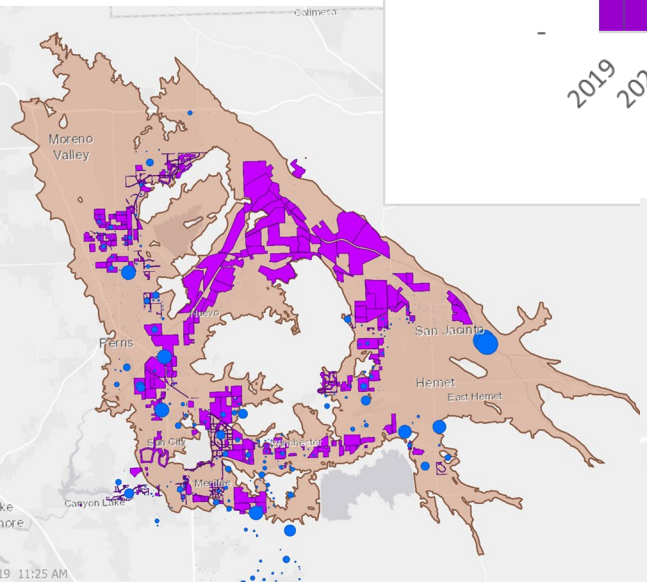
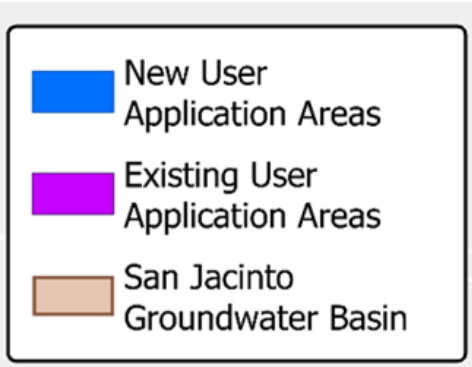
Recycled Water Sales Deliveries

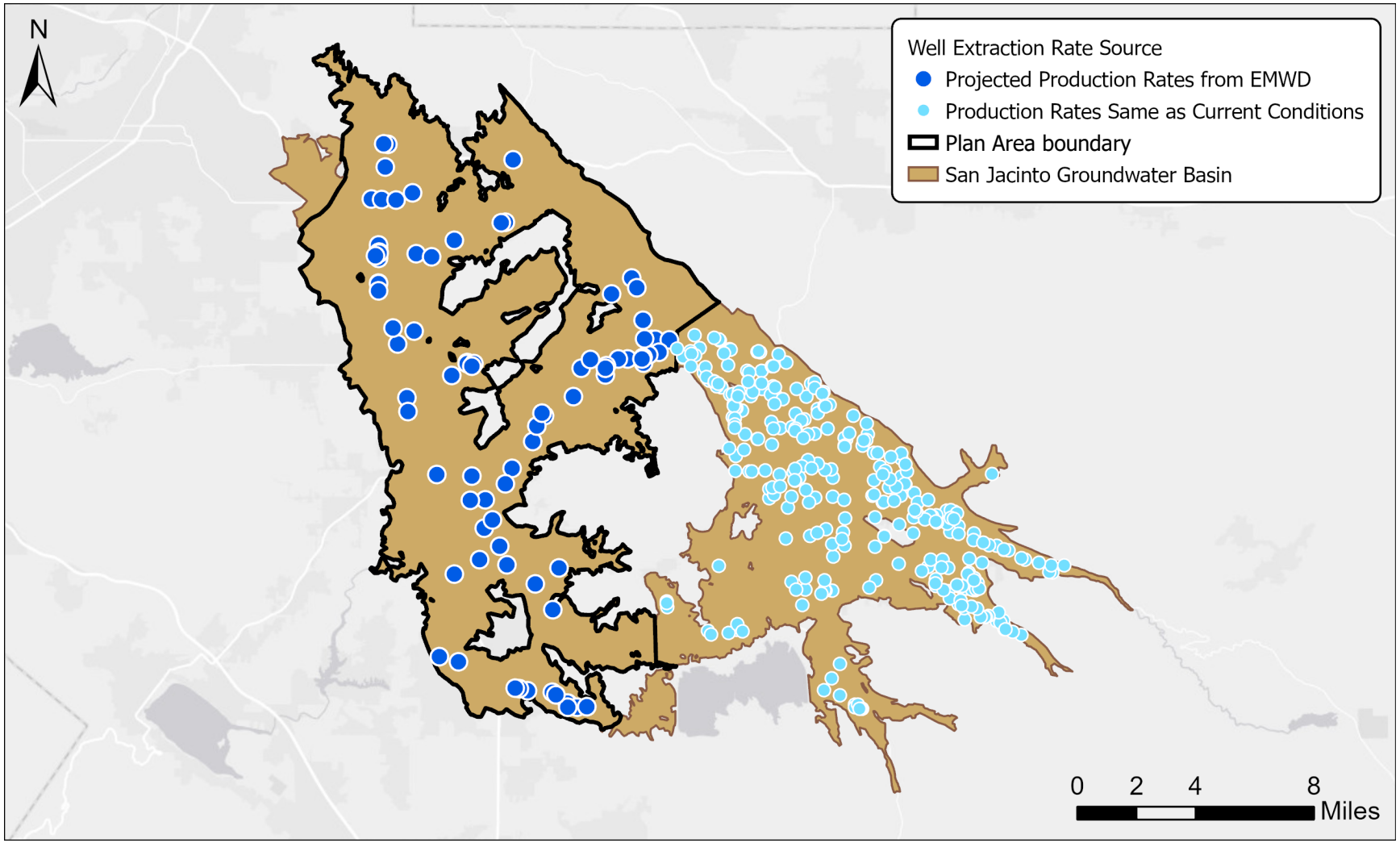




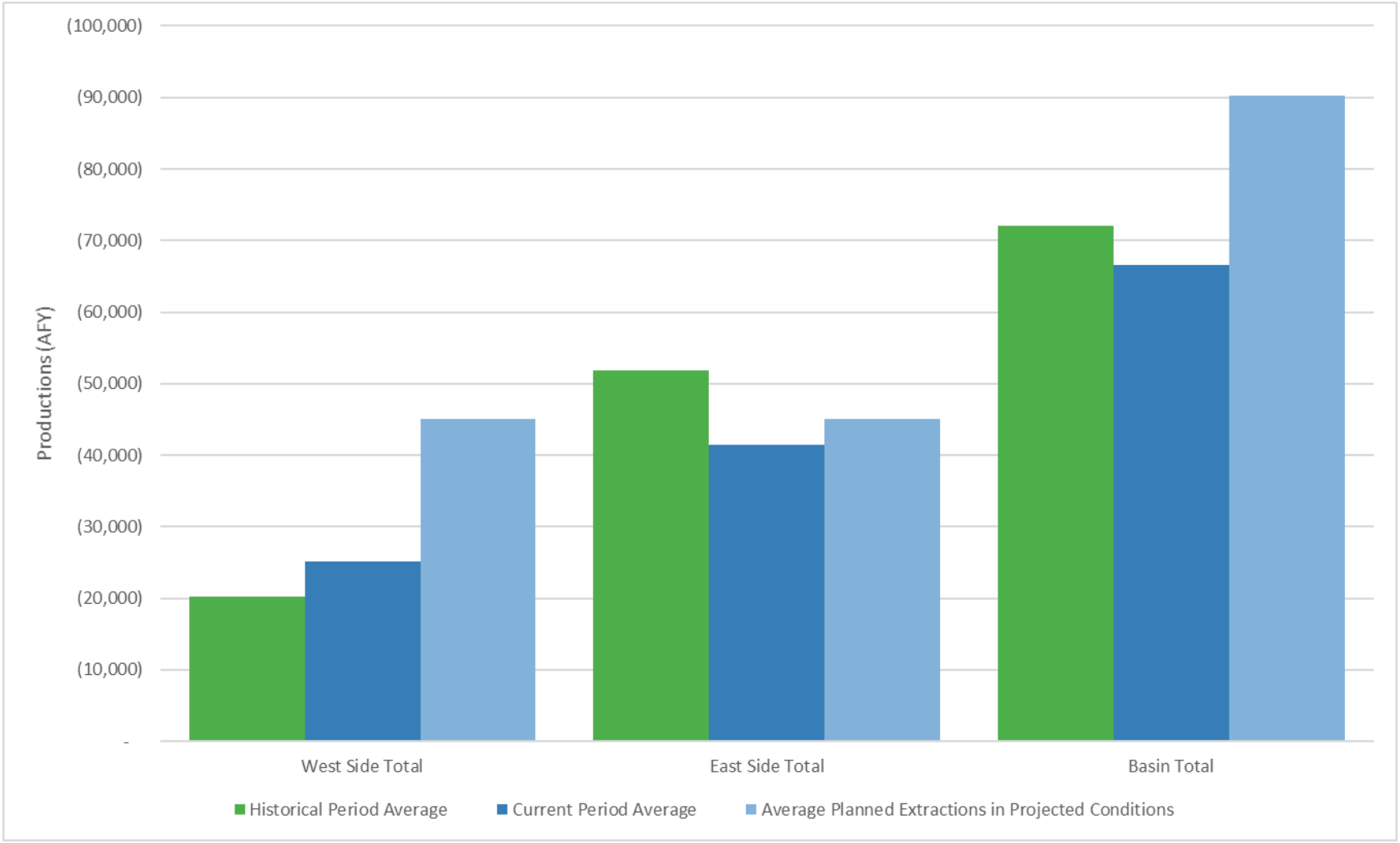


emwd

Groundwater Production Locations

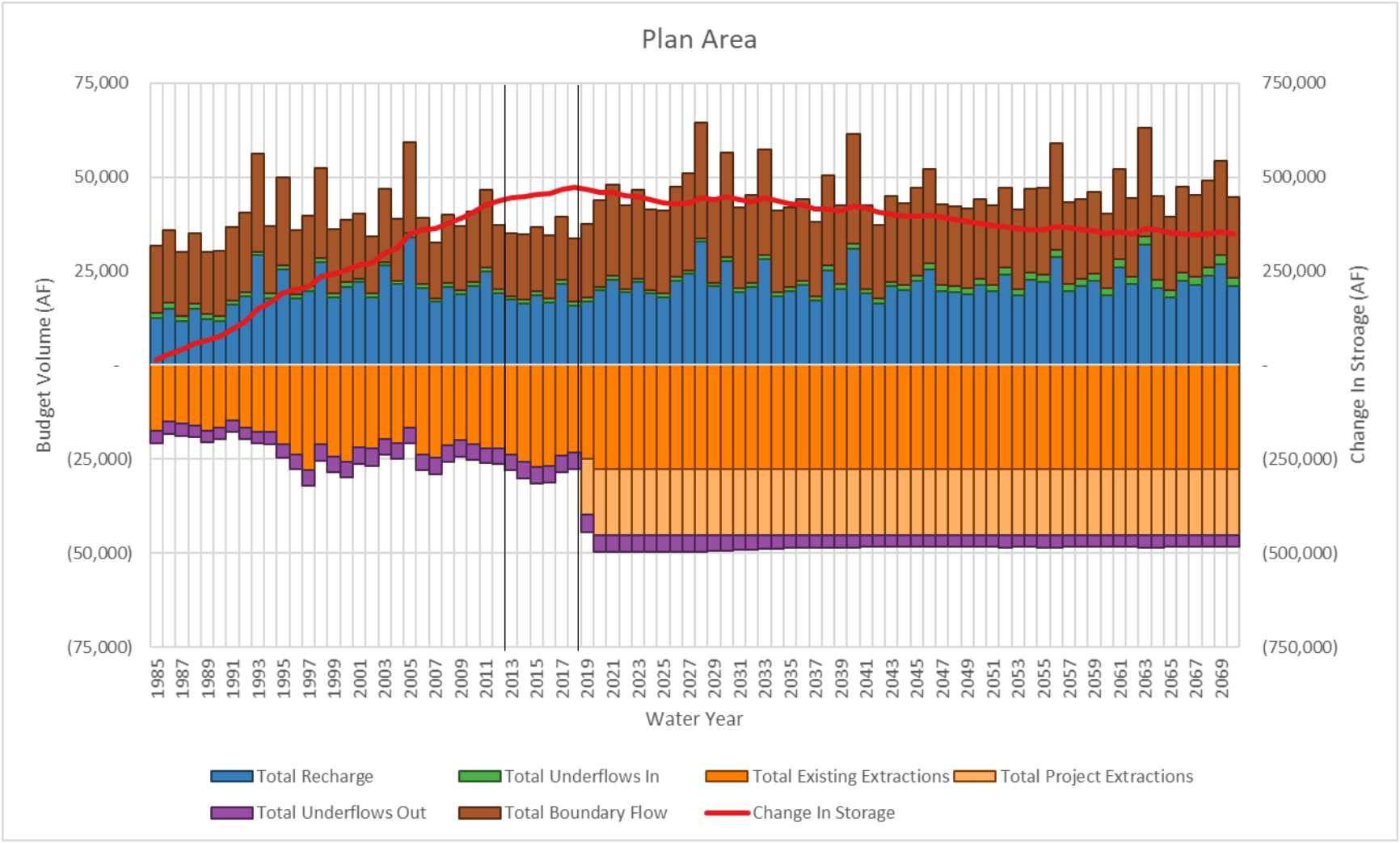


Groundwater Production in the Basin



Plan Area Water Budgets

Plan Area Summary

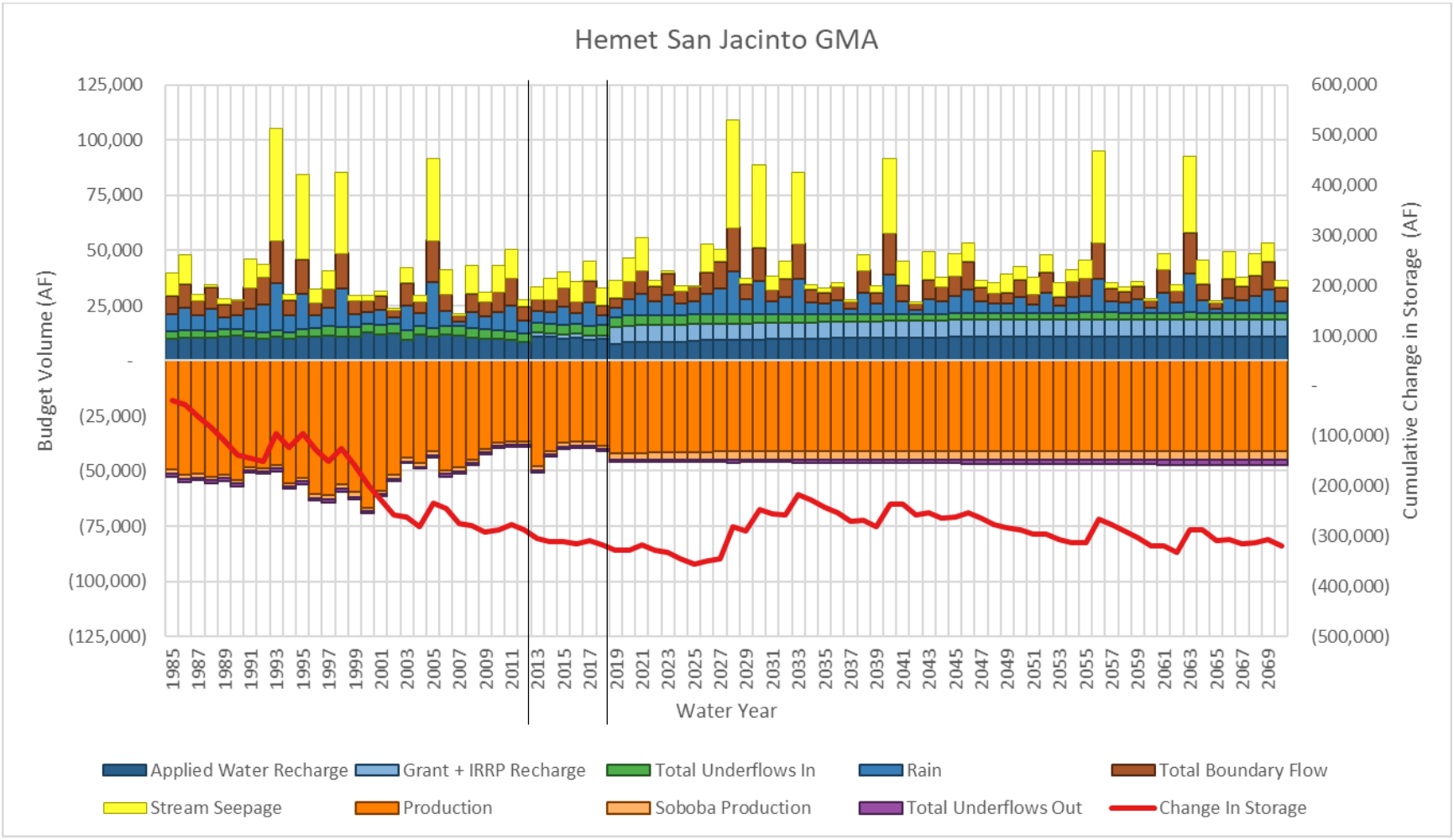


Plan Area Summary

Flow		Historical Period Average WY 1985-2012 (AFY)		Current Condition Average WY 2013-2018 (AFY)		Updated Projected Baseline Average WY 2019-2070 (AFY)	
Recharge	*EMWD Sales*	3,169	19,397	2,539	17,365	4,472	21,603
	Irrigation	1,504		577		436	
	Rain	8,718		5,462		7,090	
	Reclaimed Ponds	4,822		7,623		8,177	
	Recycled Water Sales	1,032		954		1,164	
	Subagency Sales	152		210		264	
Stream Seepage		307	307	300	300	306	306
Underflows In	*From Hemet North*	657	1,128	577	1,015	858	1,515
	From Hemet South	253		247		501	
	From Upper Pressure	219		191		157	
Boundary Flows	*From Sun City Area*	889	18,760	1,098	16,932	1,160	22,876
	Lake Perris Right Dam Seepage	585		585		585	
	Lake Perris Right Dam Seepage	3,400		3,400		7,500	
	Lake Perrs Native Underflow	3,201		3,201		3,201	
	Mountain Front Recharge	10,685		8,647		10,429	
Total Average Annual Inflow		39,593		35,612		46,299	
Underflows Out	*To Hemet North*	103	3,823	0	4,370	1	3,554
	To Hemet South	3		2		6	
	To Upper Pressure	3,717		4,368		3,547	
Productions	*Toe Drain*	3,400	20,235	3,400	25,144	0	45,096
	LPSRW	0		0		7,500	
	EGETS Wells	0		0		241	
	Perris North Project	0		0		6,717	
	Perris South Desal Project	0		0		2,985	
	Existing Wells	16,835		21,744		27,652	
Total Average Annual Outflow		24,058		29,514		48,650	
Average Annual Change in GW Storage		15,535		6,098		(2,351)	

Hemet-San Jacinto Water Management Area Water Budgets

Hemet-San Jacinto Water Management Area

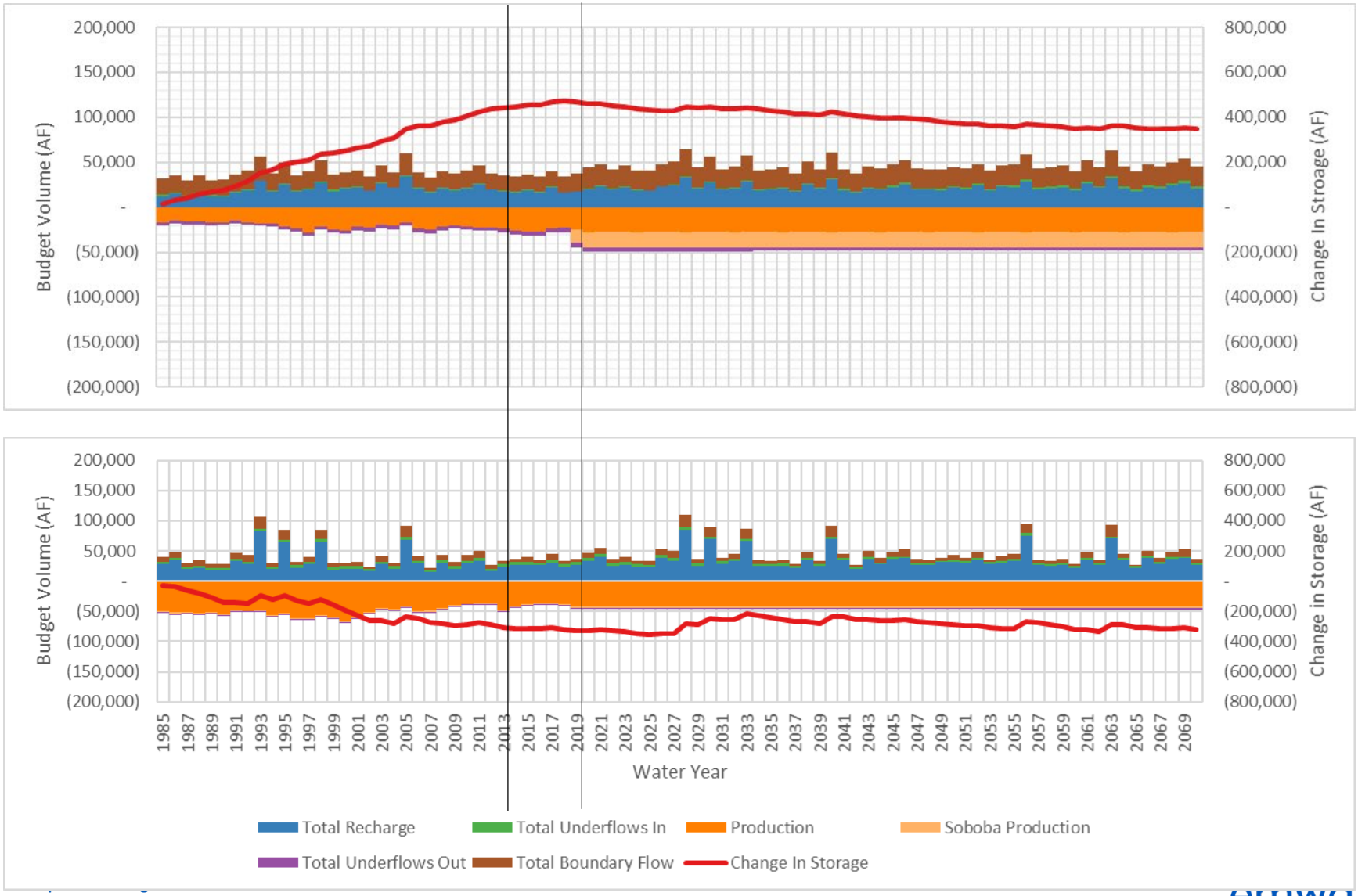


Hemet-San Jacinto Water Management Area

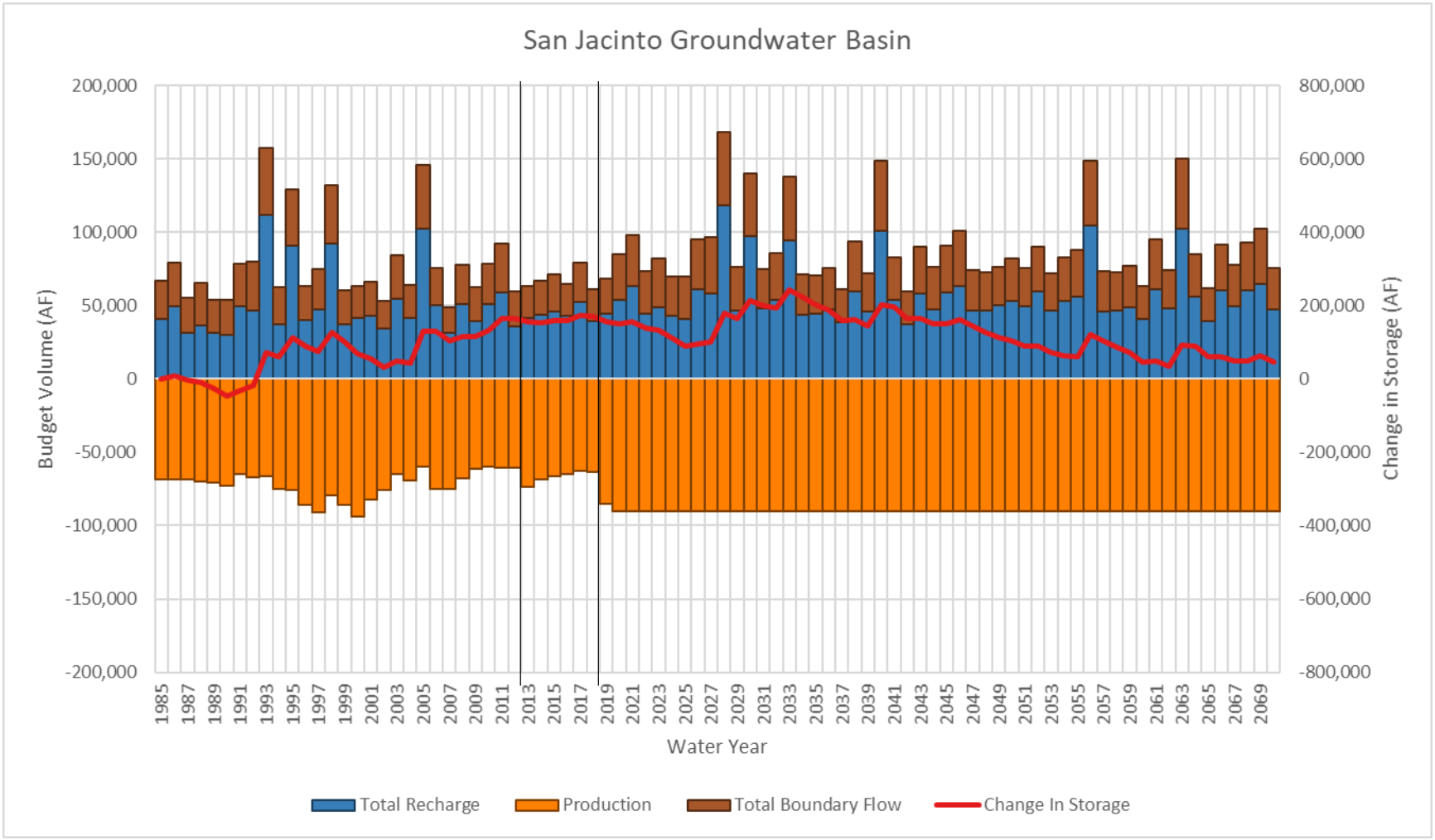
Flow		Historical Period Average WY 1985-2012 (AFY)		Current Condition Average WY 2013-2018 (AFY)		Updated Projected Baseline Average WY 2019-2070 (AFY)	
Recharge	*Applied Water Recharge*	10,677	19,639	10,305	18,579	10,326	25,276
	Rain	8,962		6,548		7,451	
	Grant + IRRP Recharge	0		1,727		7,500	
Steam Seepage		10,833	10,833	7,915	7,915	9,489	9,489
Underflows In	*From Menifee*	3	3,823	2	4,370	6	3,554
	From Lower Pressure	3,717		4,368		3,547	
	From Lakeview	103		0		1	
Boundary Flows	*Mountain Front Recharge*	8,992	8,992	6,570	6,570	8,258	8,258
Total Average Annual Inflow		43,287		37,435		46,578	
Underflows Out	*To Perris South*	253	1,128	247	1,015	501	1,515
	To Lower Pressure	219		191		157	
	To Lakeview	657		577		858	
Extractions	*EMWD*	13,740	51,834	7,199	41,387	7,303	45,083
	LHWMD	9,524		9,355		7,434	
	City of Hemet	4,344		3,672		4,542	
	City of San Jacinto	2,976		2,637		3,004	
	Soboba (From Natural Recharge)	1,469		1,491		1,500	
	Soboba	224		167		2,435	
	Agency Unused Soboba	0		4,287		5,065	
	Private Production	19,559		12,581		13,800	
Total Average Annual Outflow		52,962		42,403		46,598	
Average Annual Change in GW Storage		(9,675)		(4,968)		(21)	

Total Water Budget

Total Water Budget – Parts of the Whole



Total Water Budget



Total Water Budget

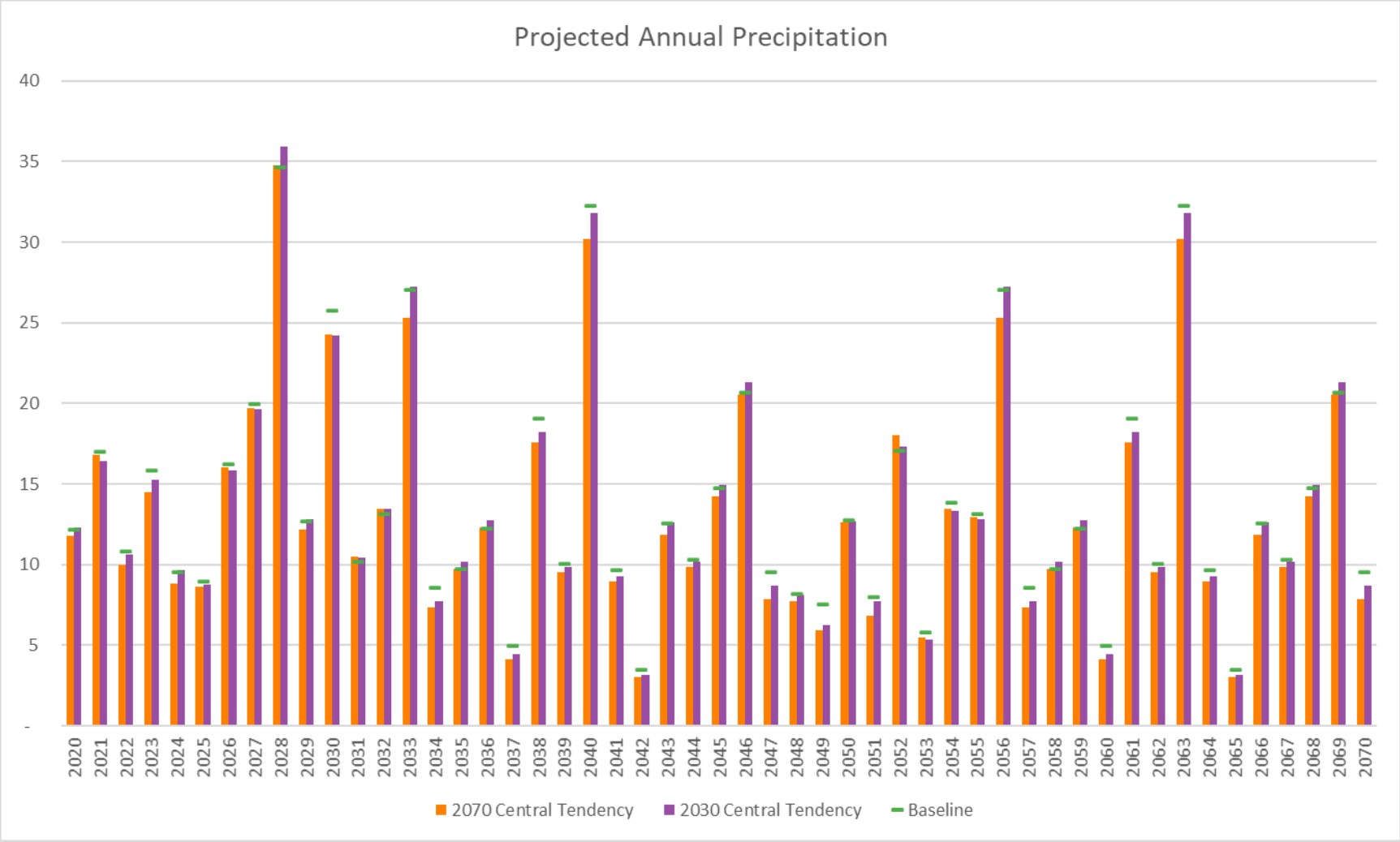
Flow		Historical Period Average WY 1985-2012 (AFY)		Current Condition Average WY 2013-2018 (AFY)		Updated Projected Baseline Average WY 2019-2070 (AFY)	
Recharge	*Sales*	9,729	39,037	11,408	35,944	13,669	46,879
	Irrigation	5,121		2,583		2,398	
	Rain	17,680		12,010		14,540	
	Artificial	6,506		9,943		16,271	
Stream Seepage		11,140	11,140	8,215	8,215	9,795	9,795
Boundary Flows	*From Sun City Area*	889	27,752	1,098	23,502	1,160	31,134
	Lake Perris Right Dam Seepage	585		585		585	
	Lake Perris Right Dam Seepage	3,400		3,400		7,500	
	Lake Perrs Native Underflow	3,201		3,201		3,201	
	Mountain Front Recharge	19,678		15,218		18,688	
Total Average Annual Inflow		77,929		67,661		87,807	
Production	*Toe Drain*	3,400	72,069	3,400	66,531	0	90,179
	LPSRW	0		0		7,500	
	EGETS Wells	0		0		241	
	Perris North Project	0		0		6,717	
	Perris South Desal Project	0		0		2,985	
	Soboba	1,692		1,657		3,935	
	HSJ Mgmt Area Production	50,142		39,730		41,148	
	West Side Basin Production	16,835		21,744		27,652	
Total Average Annual Outflow		72,069		66,531		90,179	
Average Annual Change in GW Storage		5,860		1,130		(2,371)	

Climate Change Data Downscaling to Groundwater Model Applications

- Data from Global Climate Models (GCMs) are downscaled to a regional planning scale
- Downscaled data is available in pre-existing datasets

Source: DWR SGMA Climate Change Guidance

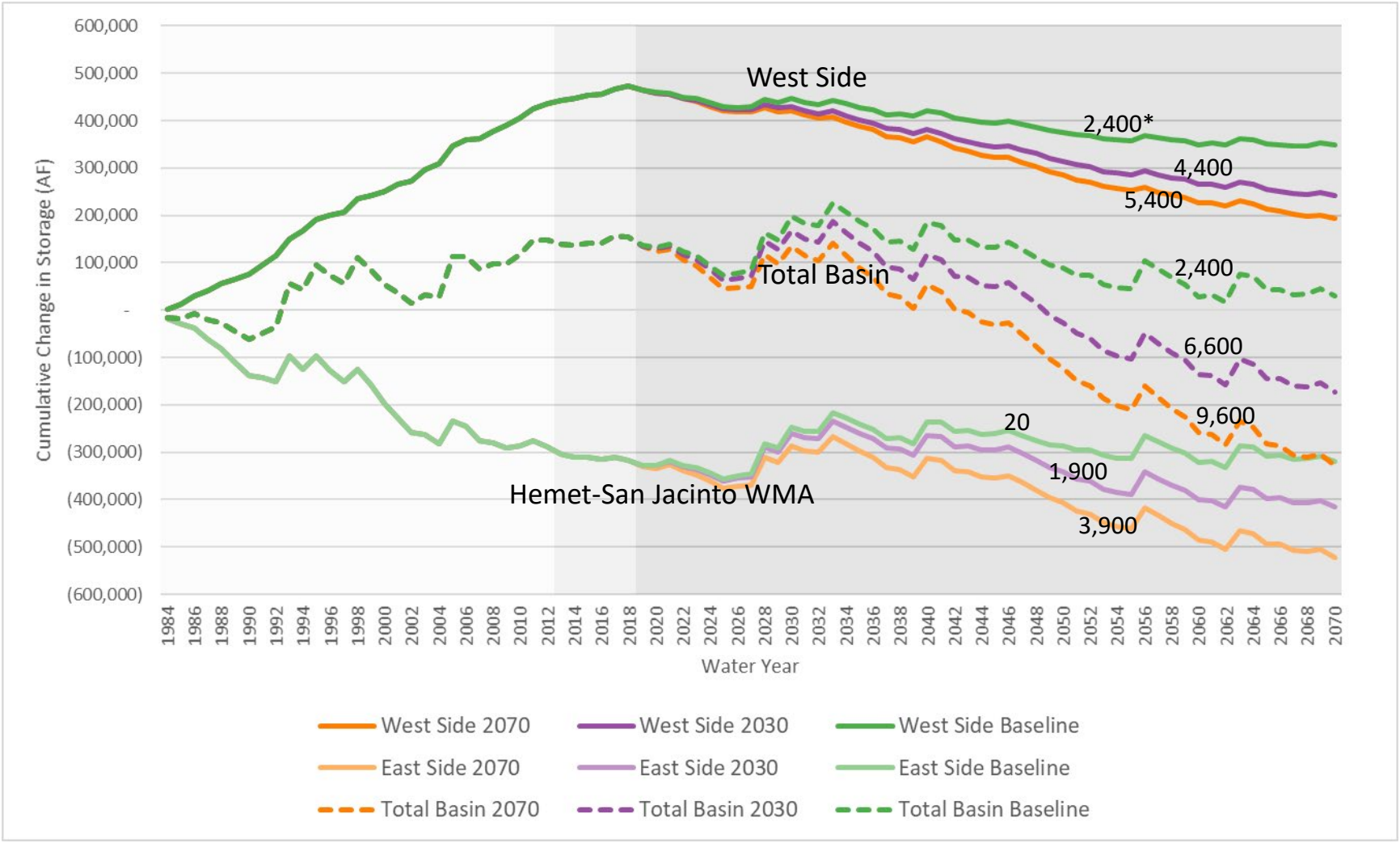
Changes to Precipitation



Changes to Precipitation (West San Jacinto Basin)

Category	Projected Baseline	2030 Central Tendency	2070 Central Tendency
% of Baseline Precipitation	100%	98%	95%
Average Annual Modeled Precipitation	9.17”	8.99”	8.71”
Difference in Annual Modeled Precipitation	-	-0.18”	-0.46”

Projected Change in GW Storage – Baseline and Climate Change Scenarios



* Numbers show the long-term projected annual rate of decline in GW Storage (AF/Yr)

Minimum Thresholds and Measurable Objectives for Groundwater Quality

Minimum Thresholds Under SGMA

- From the SGMA Emergency Regulations:
  - "Each Agency in its Plan shall establish minimum thresholds that quantify groundwater conditions for each applicable sustainability indicator at each monitoring site or representative monitoring site established pursuant to Section 354.36 (Representative Monitoring)" (23 CCR § 354.28. Minimum Thresholds)
  - "An Agency may establish a representative minimum threshold for groundwater elevation to serve as the value for multiple sustainability indicators where the Agency can demonstrate that the value is a reasonable proxy." (23 CCR § 354.28(d))

SUSTAINABILITY INDICATORS

Groundwater elevation
MT = Water Level

Groundwater in storage
MT = Water Level

Land Subsidence
MT = Water Level

Interconnected surface water and groundwater – Not applicable

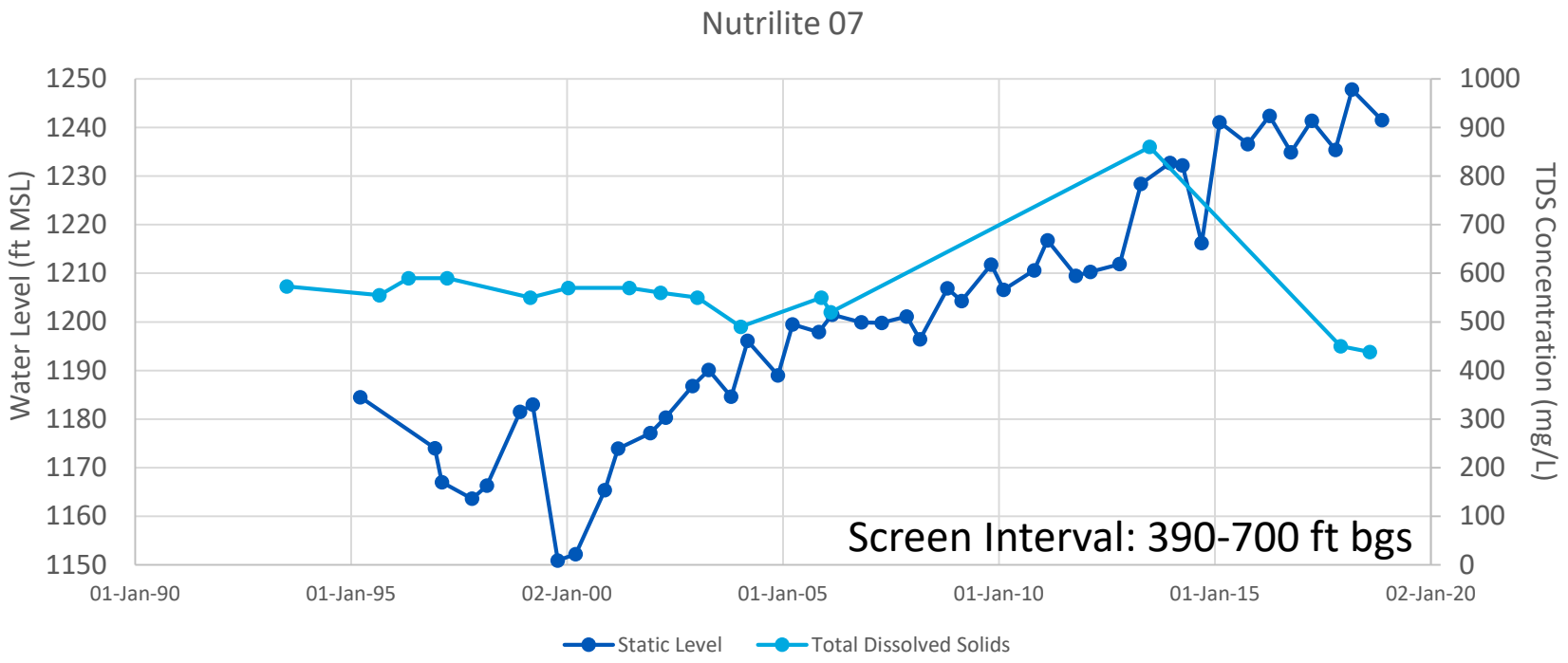
Water Quality
MT = TDS Concentration

Seawater Intrusion – Not applicable

emwd

Water Levels Not Appropriate Proxy

- Water level does not correlate with concentration

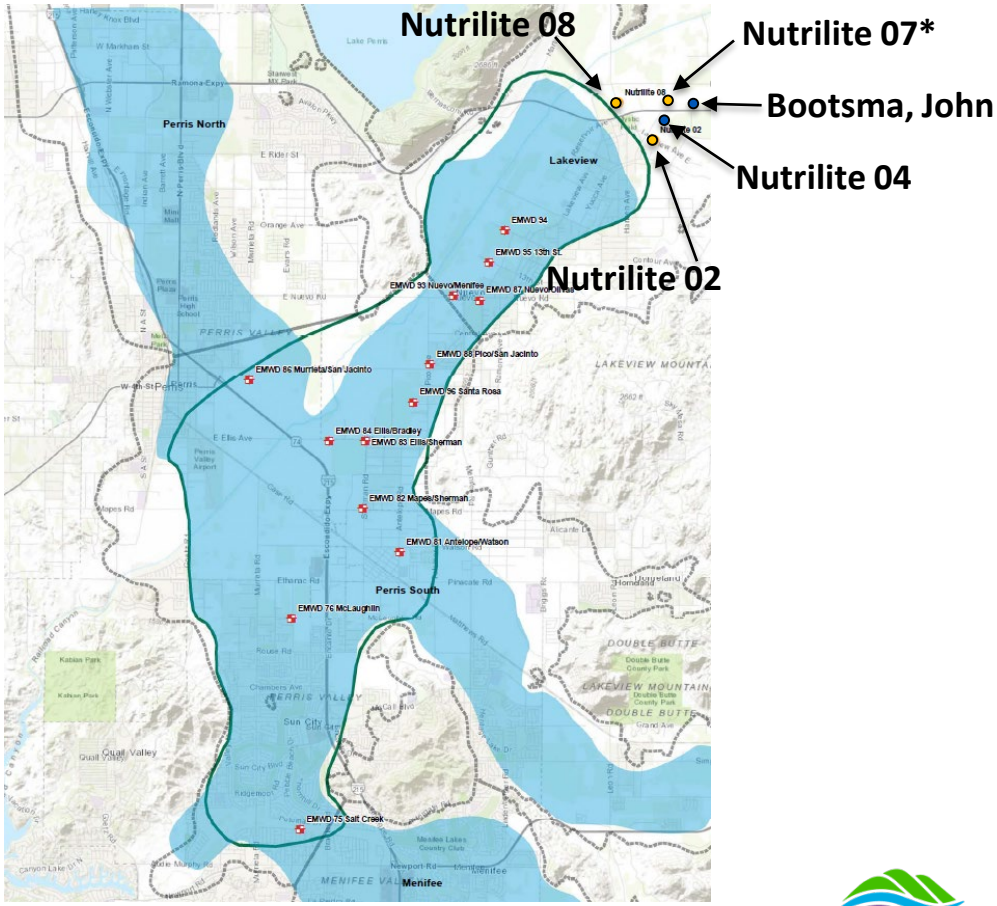


Water Quality General Undesirable Result

- Ongoing northeast migration of brackish water in the Lakeview GMZ would be an undesirable result
  - Use 1000 mg/L TDS plume as indicator of extent of brackish water

- Sentinel Well – Perris II ROTF MRP
- Proposed Additional GSP Representative Monitoring Point – Water Quality ONLY

* Nutrilite 7 is also a representative monitoring point for water levels



Water Quality Representative Monitoring Points

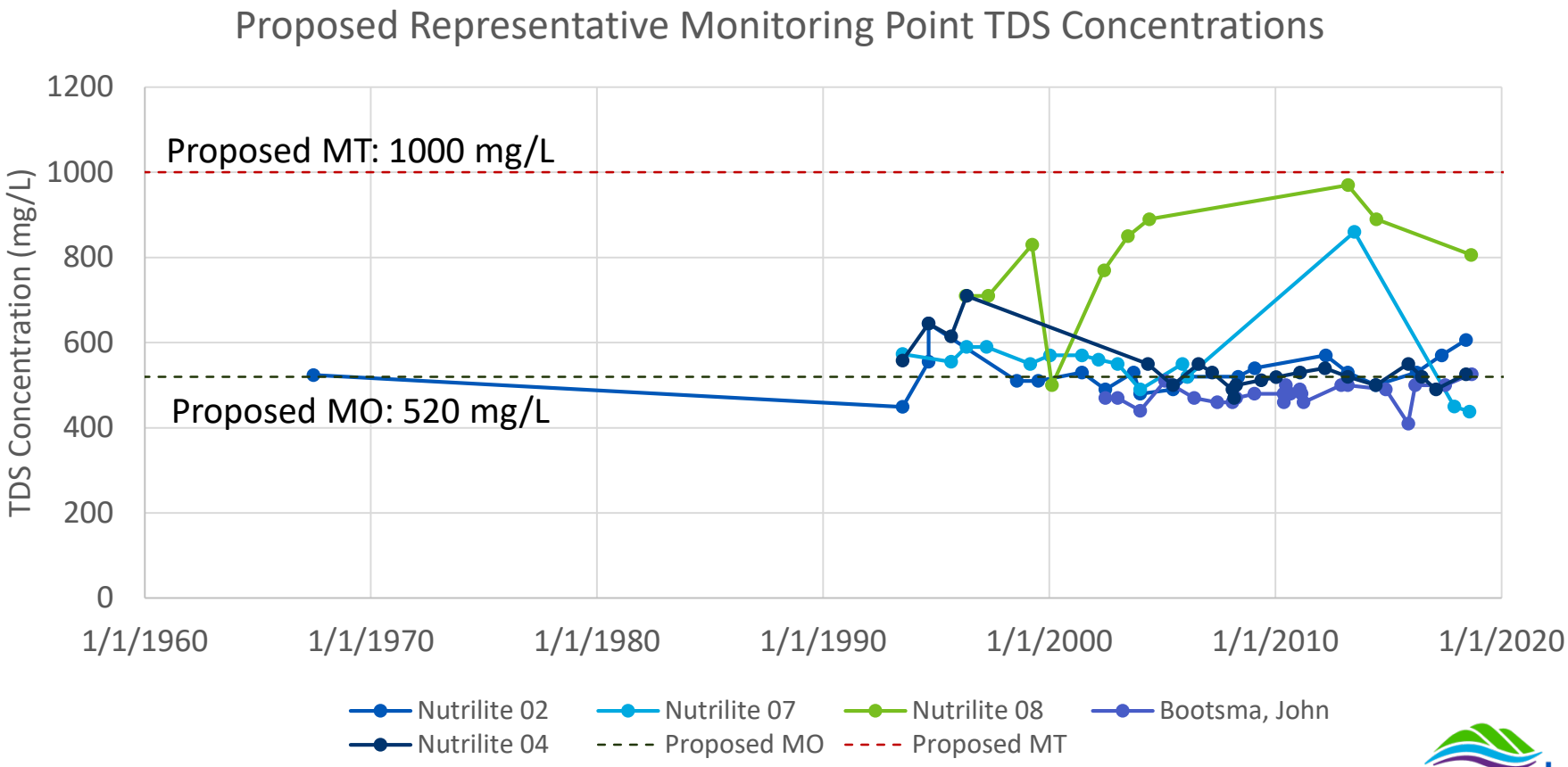
- Use Perris II Sentinel Wells: Nutrilite 02, 07*, and 08 as representative monitoring points for water quality
  - Already incorporated into existing water quality monitoring plan
- Also include wells: John Bootsma, and Nutrilite 04 as additional representative monitoring points for water quality
  - Wells screened across representative aquifer
  - Provide additional understanding of water quality trends

RMP	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)	Maximum TDS Concentration (mg/L)	Maximum TDS Concentration YEAR	Mann-Kendall Trend
Nutrilite 07*	390	700	860	2013	Decreasing
Nutrilite 02	-	-	645	1994	No Trend
Nutrilite 04	170	480	710	1996	Decreasing
Nutrilite 08	-	-	970	2013	Increasing
Bootsma, John	350	650	526	2018	Increasing

* Nutrilite 7 is also a representative monitoring point for water levels

Water Quality Minimum Threshold/ Measurable Objective

- Propose 1000 mg/L TDS as the MT for these wells
- Propose 520 mg/L TDS as the MO
  - This corresponds with the basin plan objective for Lakeview/ Hemet North



Minimum Thresholds

- Followed DWR guidance to propose *water level, groundwater in storage, and land subsidence* minimum thresholds at each representative monitoring point
- Need to define minimum threshold for groundwater quality

RMP	Proposed MT Water Levels (ft MSL)	Proposed MT Groundwater In Storage (ft MSL)	Proposed MT Land Subsidence (ft MSL)	Proposed MT Groundwater / Surface Water Interaction	Proposed MT Seawater Intrusion	Proposed MT Water Quality (TDS – mg/L)
EMWD 74	1200	1200	1200	NA	NA	NA
EMWD A1	1200	1200	1200	NA	NA	NA
EMWD Skiland 05	1200	1200	1200	NA	NA	NA
EMWD 94	1200	1200	1200	NA	NA	NA
Nutrilite 07	1100	1100	1100	NA	NA	1000
EMWD 52	1200	1200	1200	NA	NA	NA
UCR Scott	1300	1300	1300	NA	NA	NA
Nutrilite 02	NA	NA	NA	NA	NA	1000
Nutrilite 04	NA	NA	NA	NA	NA	1000
Nutrilite 08	NA	NA	NA	NA	NA	1000
Bootsma, John	NA	NA	NA	NA	NA	1000

Measurable Objectives

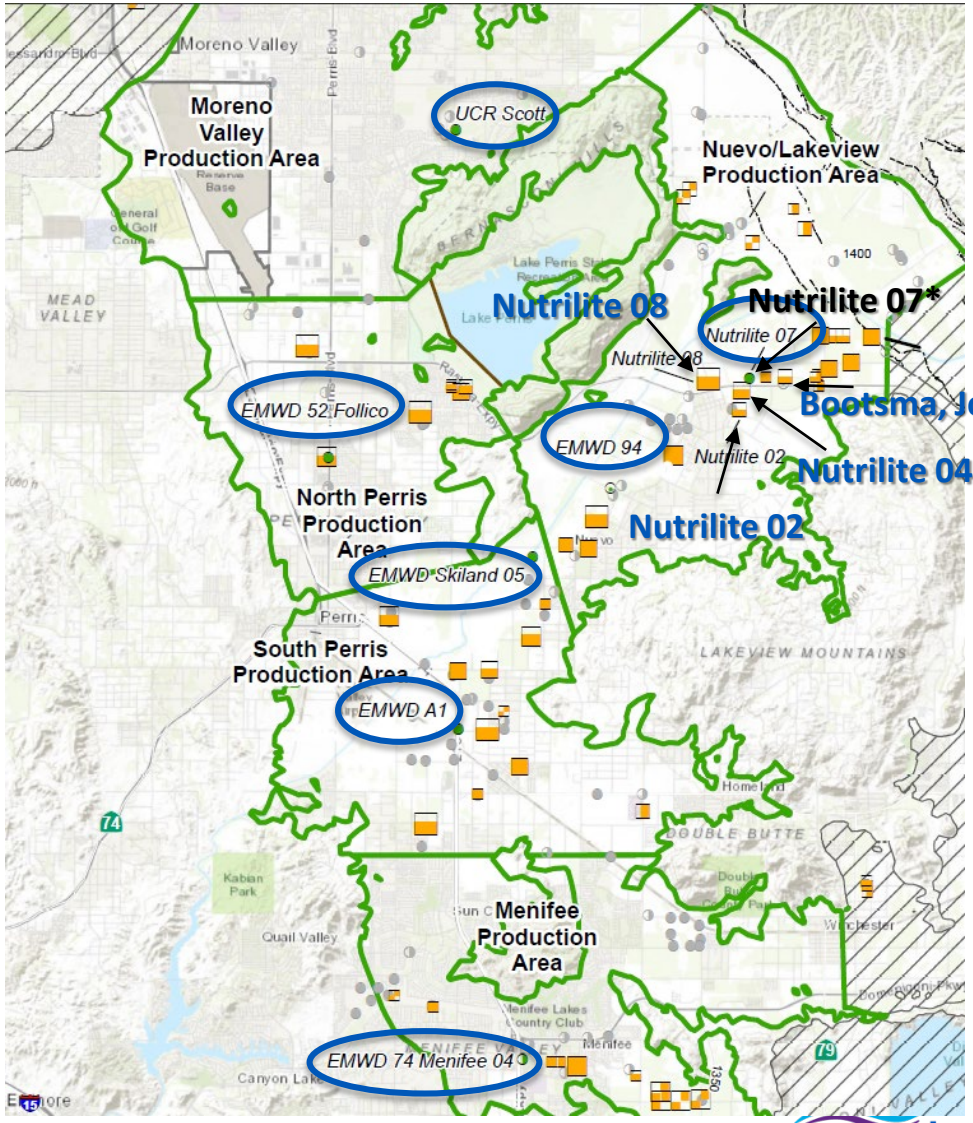
- Followed DWR guidance to propose *water level, groundwater in storage, and land subsidence* measurable objectives at each representative monitoring point
- Need to define measurable objective for groundwater quality

RMP	Proposed MO Water Levels (ft MSL)	Proposed MO Groundwater In Storage (ft MSL)	Proposed MO Land Subsidence (ft MSL)	Proposed MO Groundwater / Surface Water Interaction	Proposed MO Seawater Intrusion	Proposed MO Water Quality (TDS – mg/L)
EMWD 74	1250	1250	1250	NA	NA	NA
EMWD A1	1250	1250	1250	NA	NA	NA
EMWD Skiland 05	1250	1250	1250	NA	NA	NA
EMWD 94	1250	1250	1250	NA	NA	NA
Nutrilite 07	1150	1150	1150	NA	NA	520
EMWD 52	1250	1250	1250	NA	NA	NA
UCR Scott	1350	1350	1350	NA	NA	NA
Nutrilite 02	NA	NA	NA	NA	NA	520
Nutrilite 04	NA	NA	NA	NA	NA	520
Nutrilite 08	NA	NA	NA	NA	NA	520
Bootsma, John	NA	NA	NA	NA	NA	520

Undesirable Results

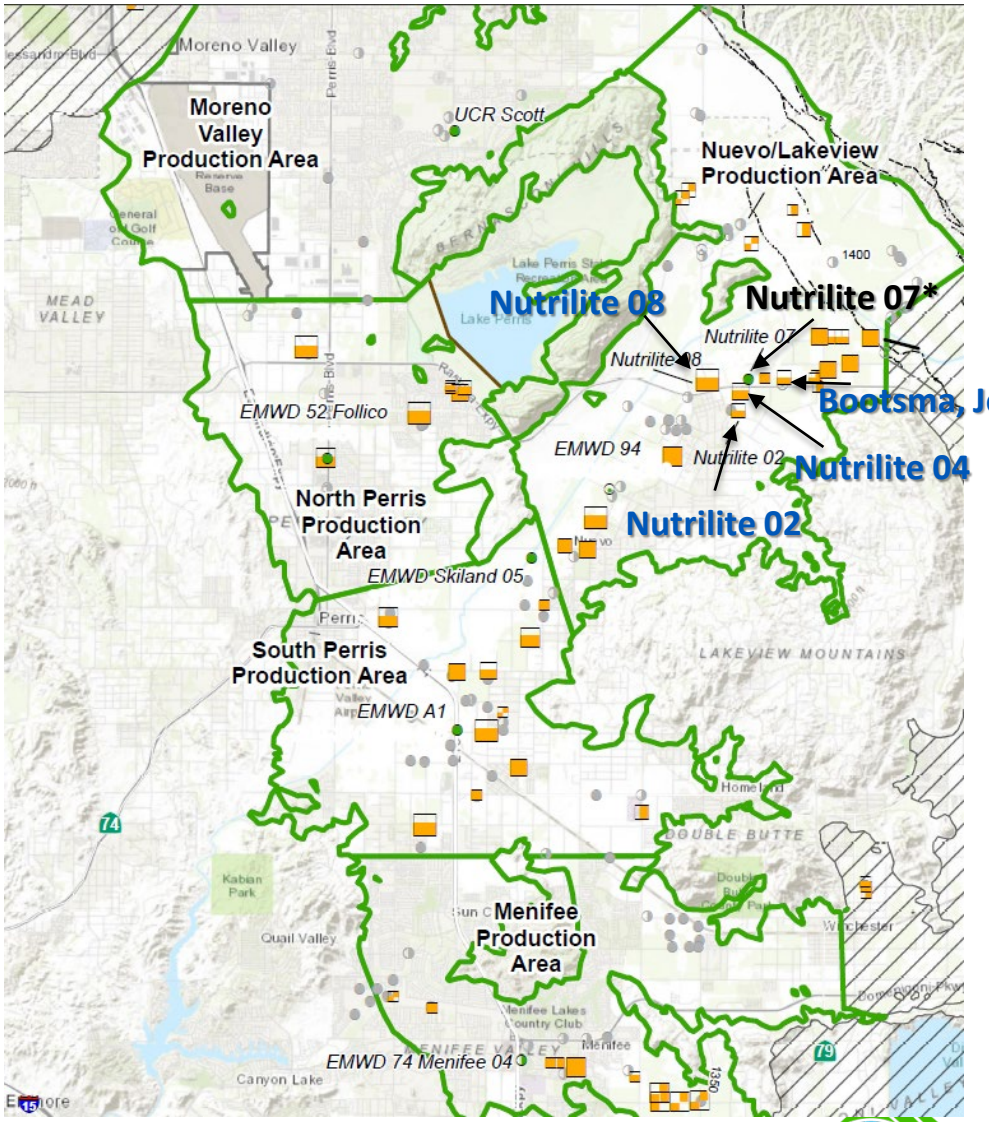
Undesirable Results

- From the SGMA Emergency Regulations:
  - "Undesirable results occur when significant and unreasonable effects for any of the sustainability indicators are cause by groundwater conditions occurring throughout the basin."
  - The criteria used to define undesirable results "shall be based on a quantitative description of the *combination* of minimum threshold exceedances that cause significant and unreasonable effects in the basin" (emphasis added).



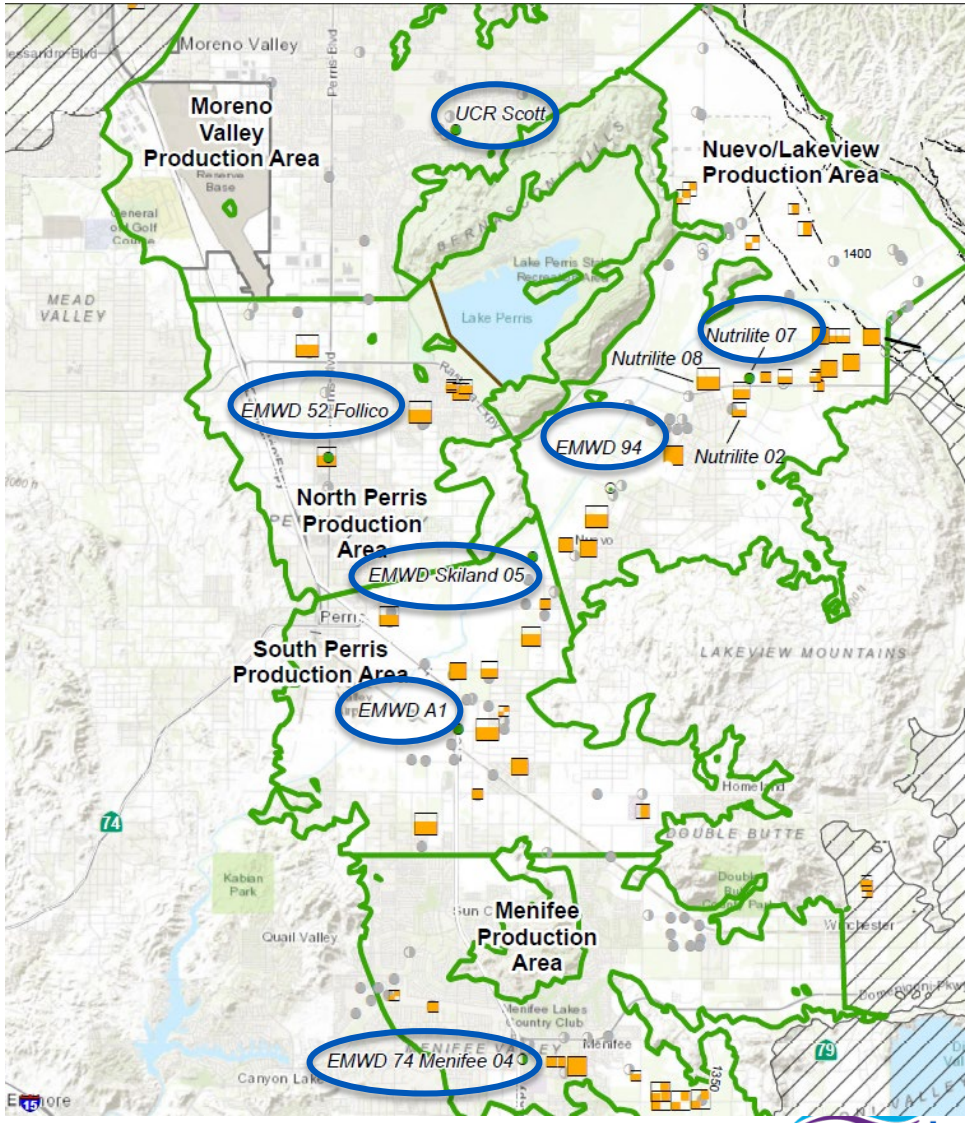
Undesirable Results: Water Quality

- Proposed quantification of undesirable results for water quality:
  - 3 of 5 wells have concentrations >1000 mg/L for 2 consecutive annual water quality sampling events



Undesirable Results: Water Levels

- Proposed quantification of undesirable results for water levels:
  - >30% of RMPs (for WL) have water levels below the minimum threshold for 2 consecutive spring monitoring events



Projects and Management Actions

Projects and Management Actions

- Projects and management actions shall be commensurate with the level of understanding of the basin setting, based on the level of uncertainty and data gaps ((23 CCR § 350.4(d))

- Each Plan shall include a description of the projects and management actions the Agency has determined will achieve the sustainability goal for the basin, including projects and management actions to respond to changing conditions in the basin. ((23 CCR § 354.44(a))

- Funded projects already included in baseline understanding of basin and incorporated in groundwater model of future conditions

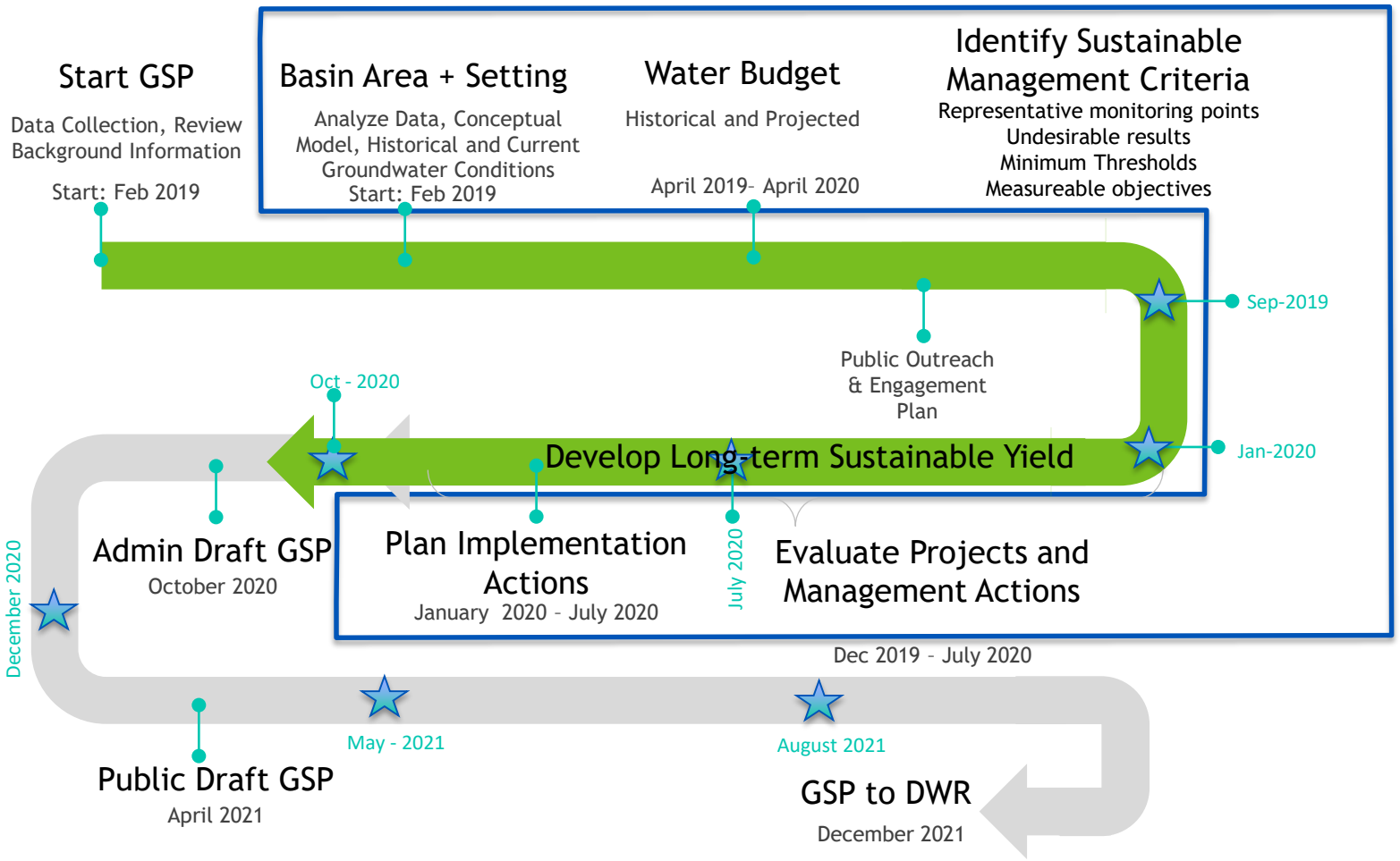
- What projects and/ or management actions would be undertaken to address “changing conditions in the basin” or unanticipated declines in groundwater elevation and storage?

Projects and Management Actions

- Adjust pumping as needed to meet water level and/ or water quality objectives
  - Increase pumping in select areas to influence groundwater gradient to better control migration of non-point sources of contamination
  - Shift production away from localized areas that are experiencing over-pumping
    - Review spring water levels relative to minimum thresholds at representative monitoring points to determine if this is necessary
  - Reduce overall production if shifting production is unsuccessful at meeting water level objectives
- Assess feasibility of recycled water delivery to private producers in the Menifee production area to offset their groundwater production
  - Only applies if water levels in Menifee drop below minimum thresholds and shifting production does not result in groundwater elevation recovery
- Conduct additional investigations and/ or technical studies
  - Collect additional data if necessary to support additional studies
  - Refine understanding of the basin hydrogeology
  - Assess controls on water quality or water levels based on revised understanding

Timeline and Next Steps

GSP Development Process



Next Steps

- EMWD and consultant team will continue to work together to:
  - Prepare the public draft GSP
- Next stakeholder advisory group meeting scheduled for April 2021

Questions

8.2 References

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