7 FIGURES AND MAPS

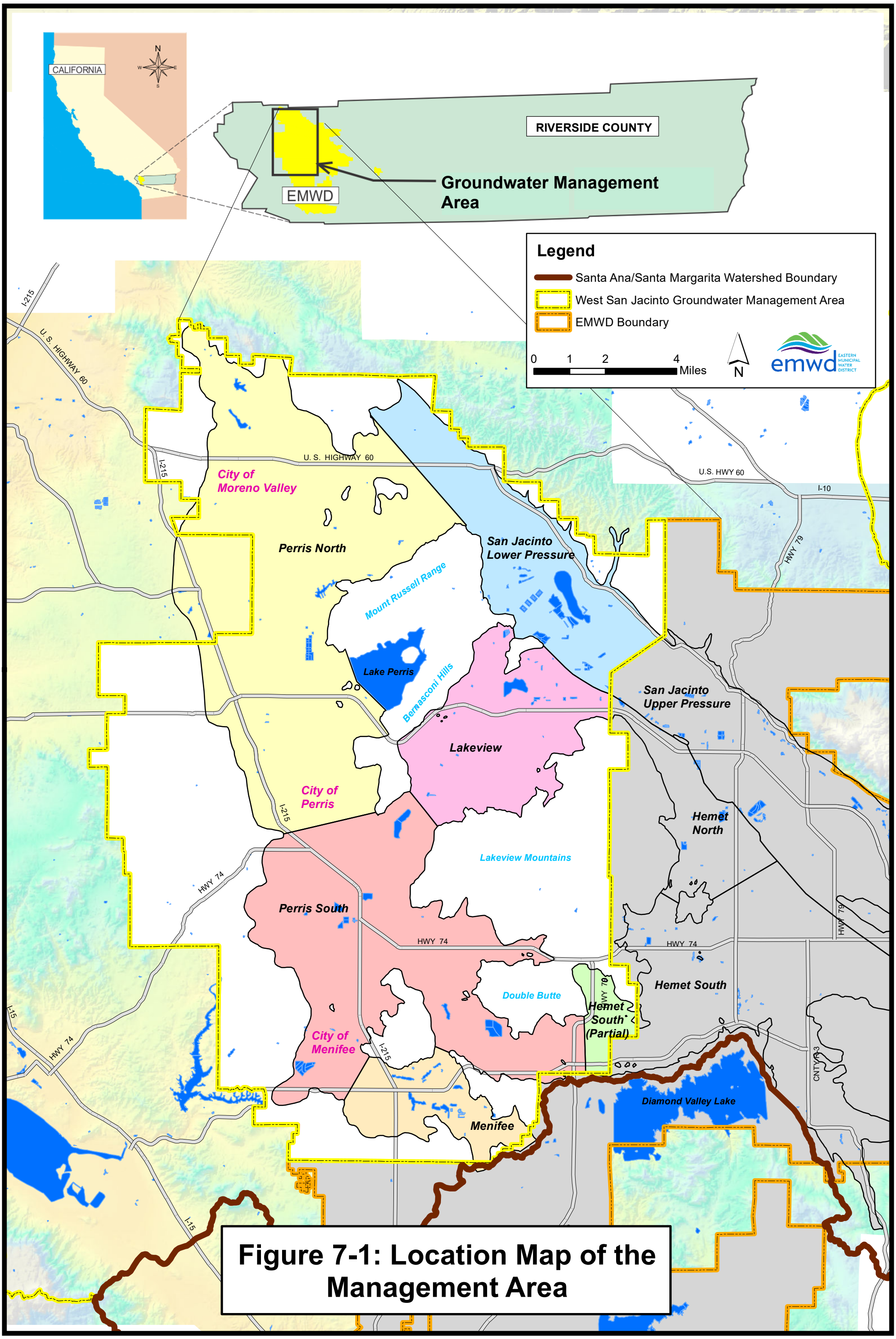


Figure 7-1: Location Map of the Management Area

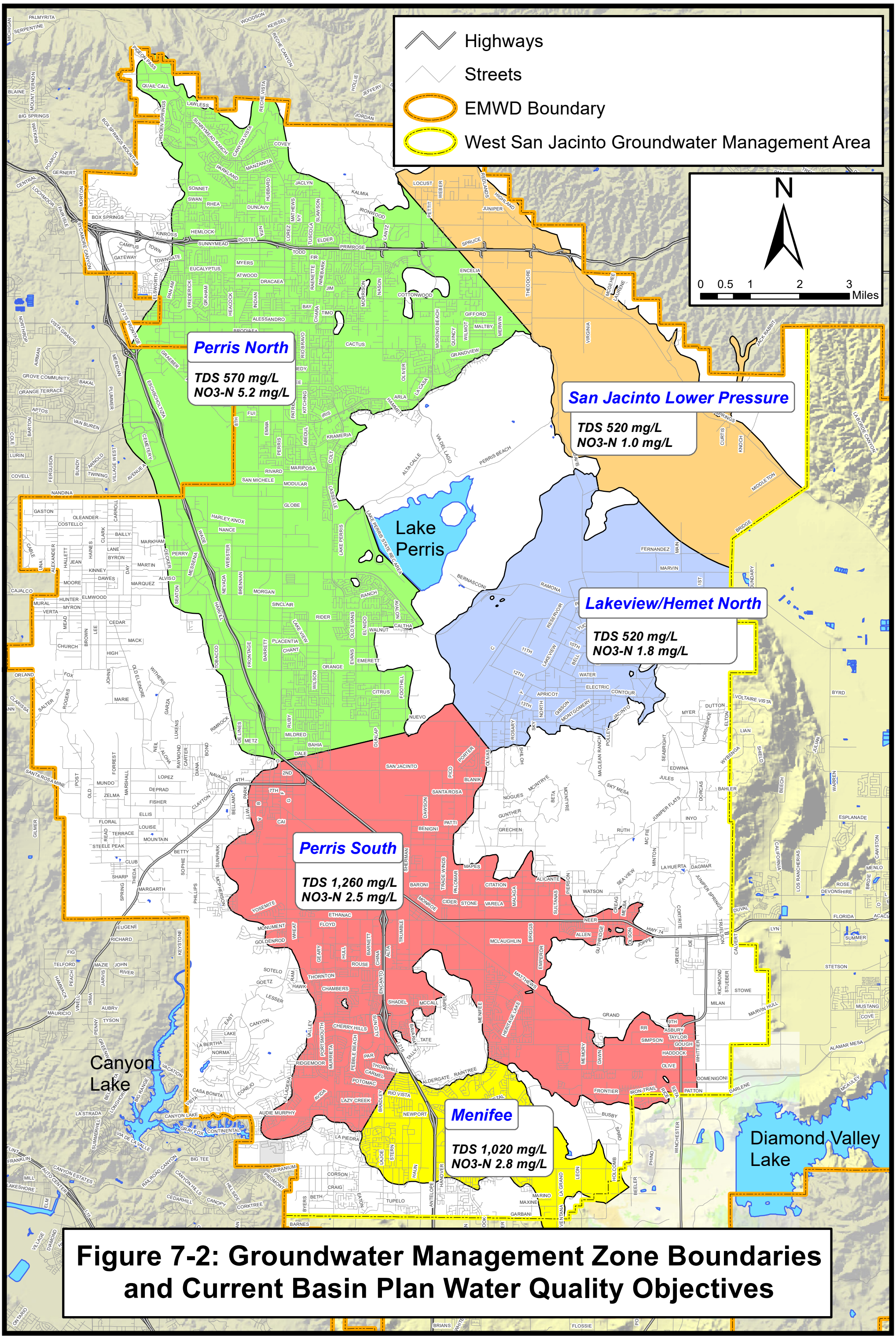


Figure 7-2: Groundwater Management Zone Boundaries and Current Basin Plan Water Quality Objectives

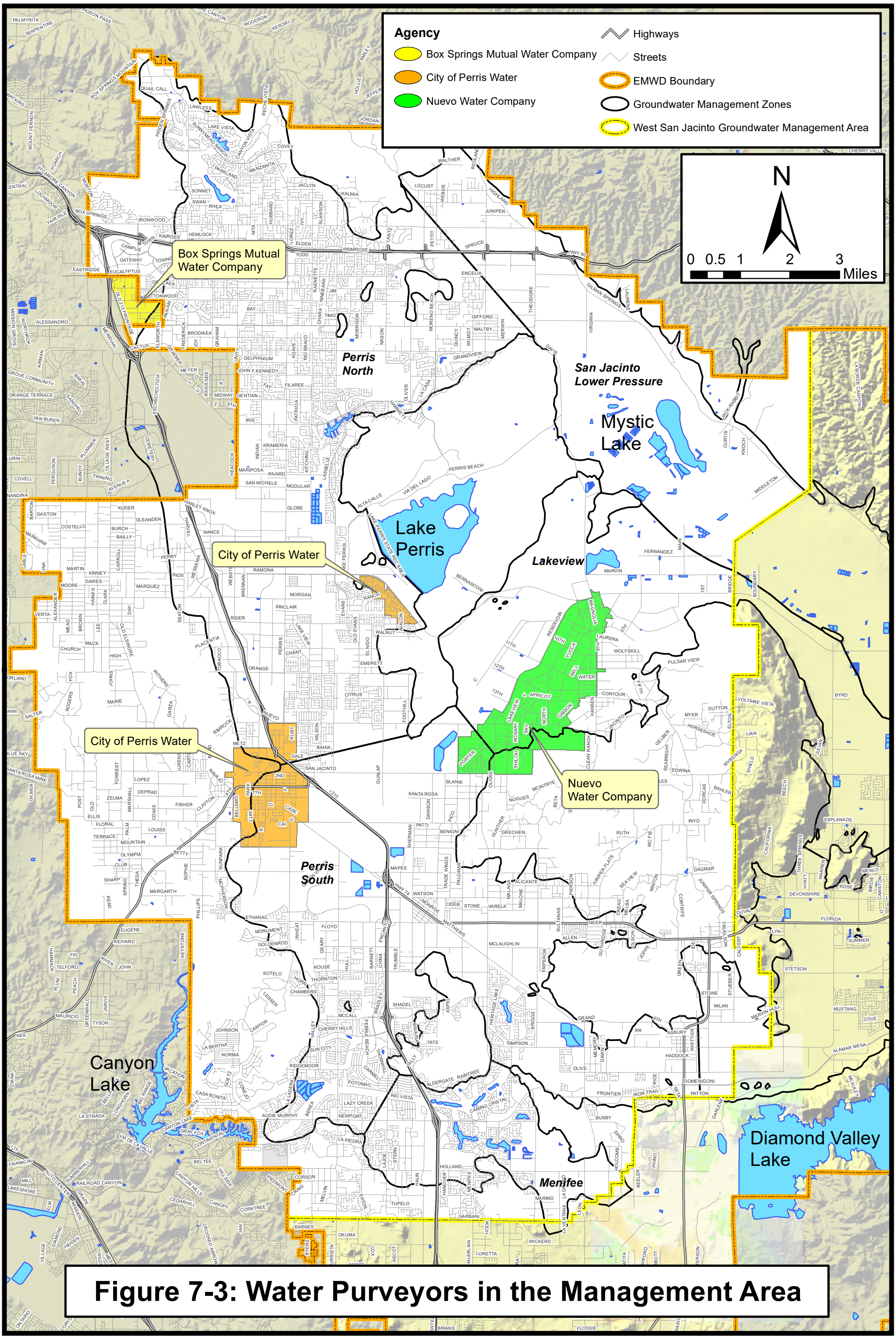


Figure 7-3: Water Purveyors in the Management Area

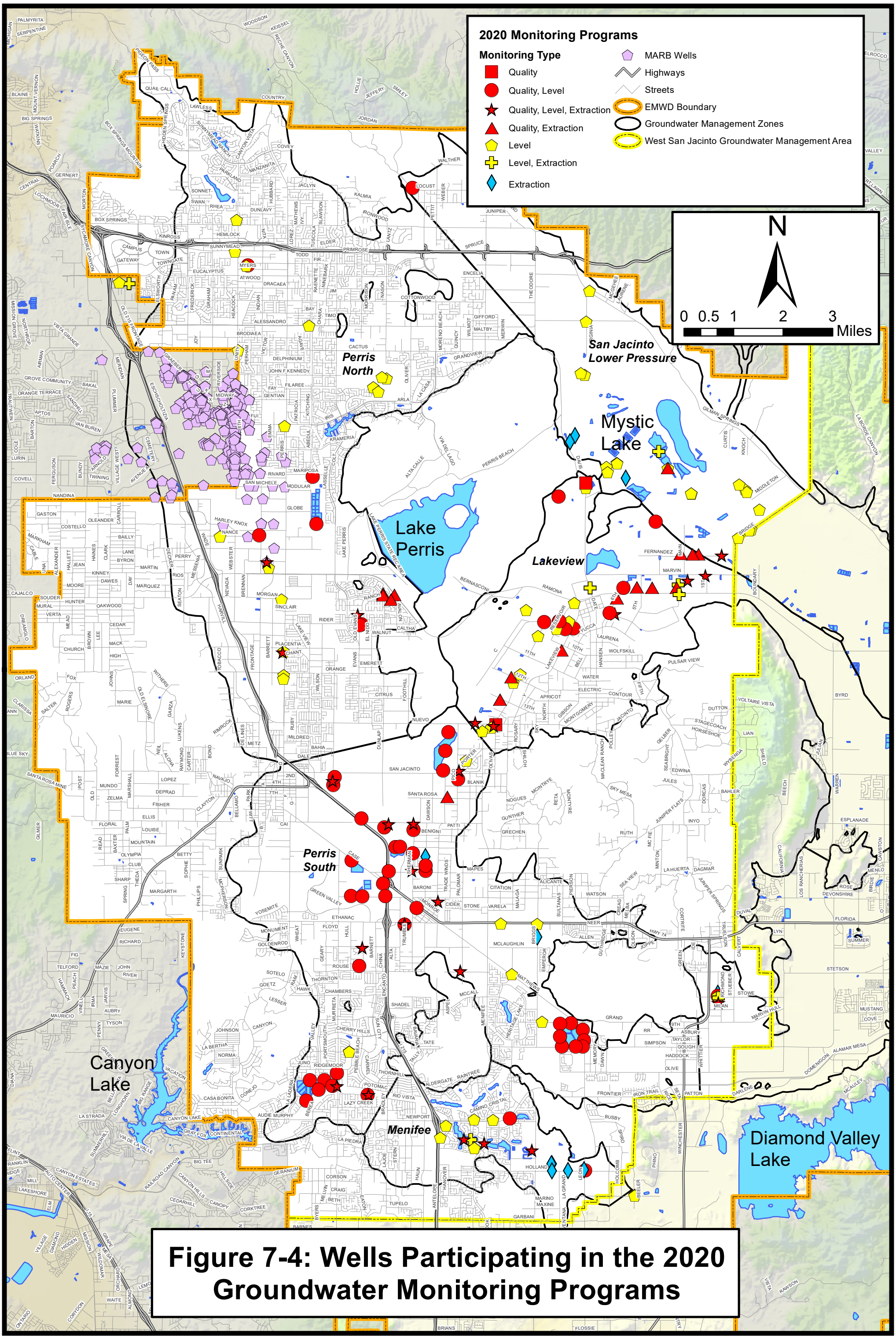


Figure 7-4: Wells Participating in the 2020 Groundwater Monitoring Programs

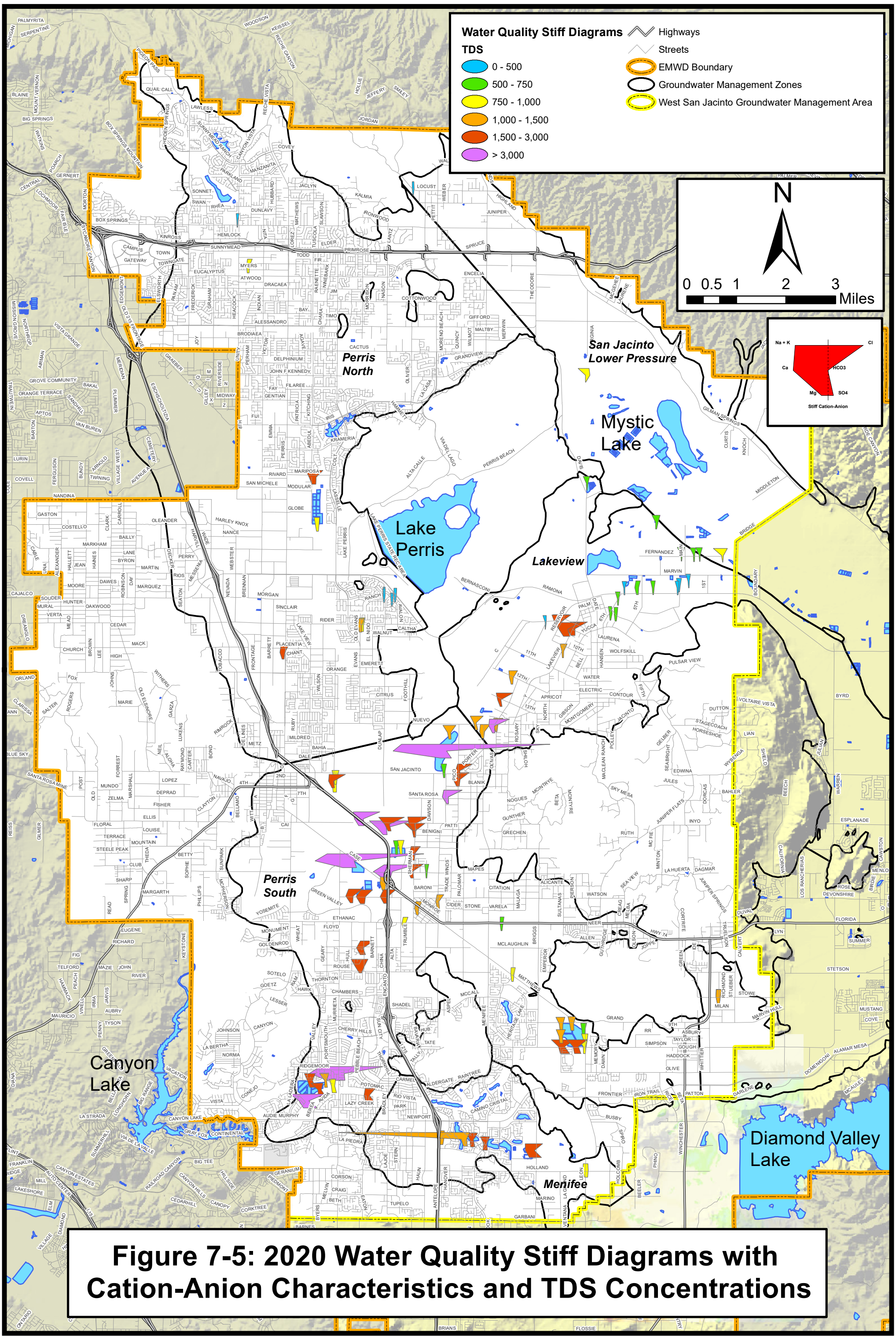


Figure 7-5: 2020 Water Quality Stiff Diagrams with Cation-Anion Characteristics and TDS Concentrations

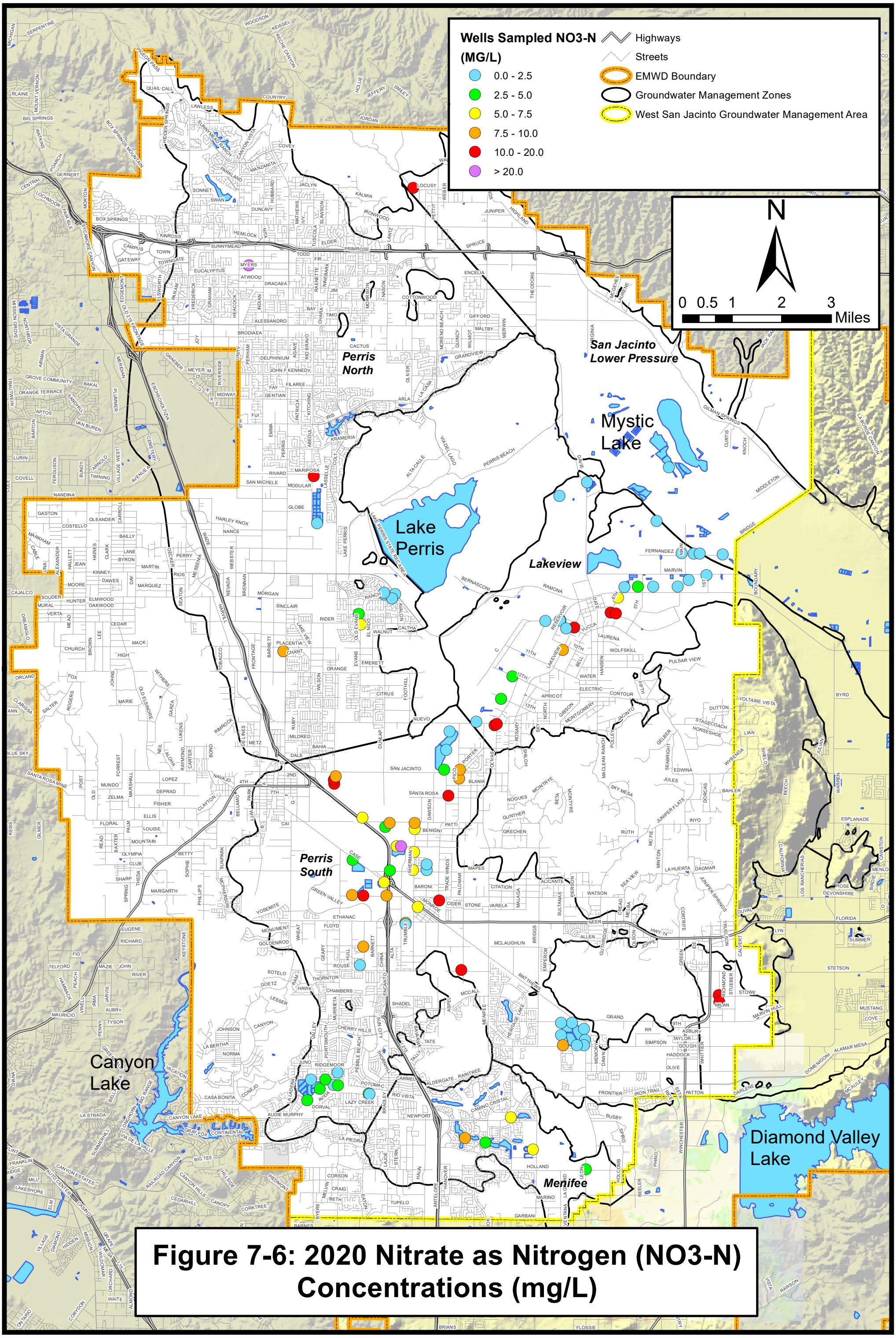


Figure 7-6: 2020 Nitrate as Nitrogen (NO3-N) Concentrations (mg/L)

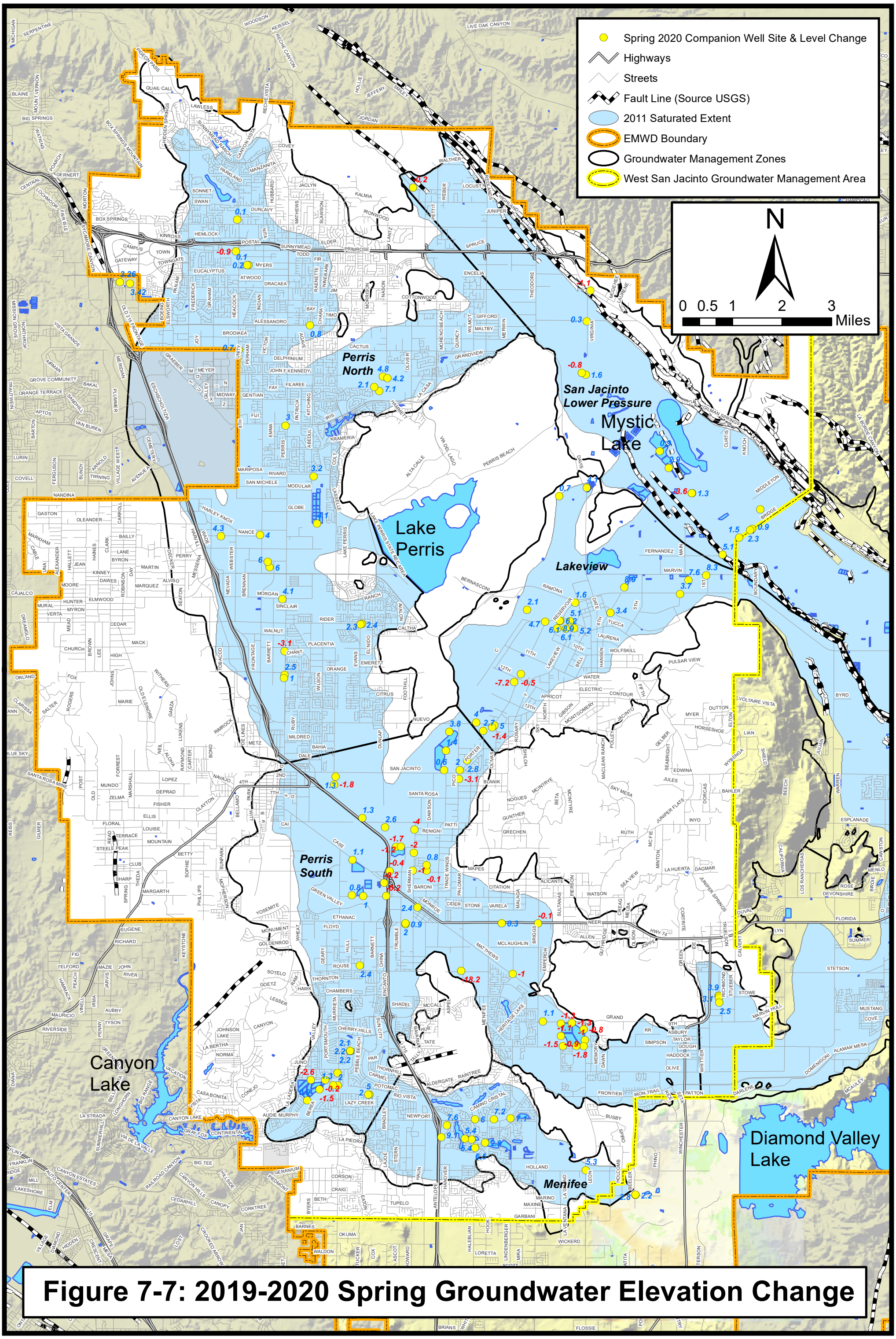


Figure 7-7: 2019-2020 Spring Groundwater Elevation Change

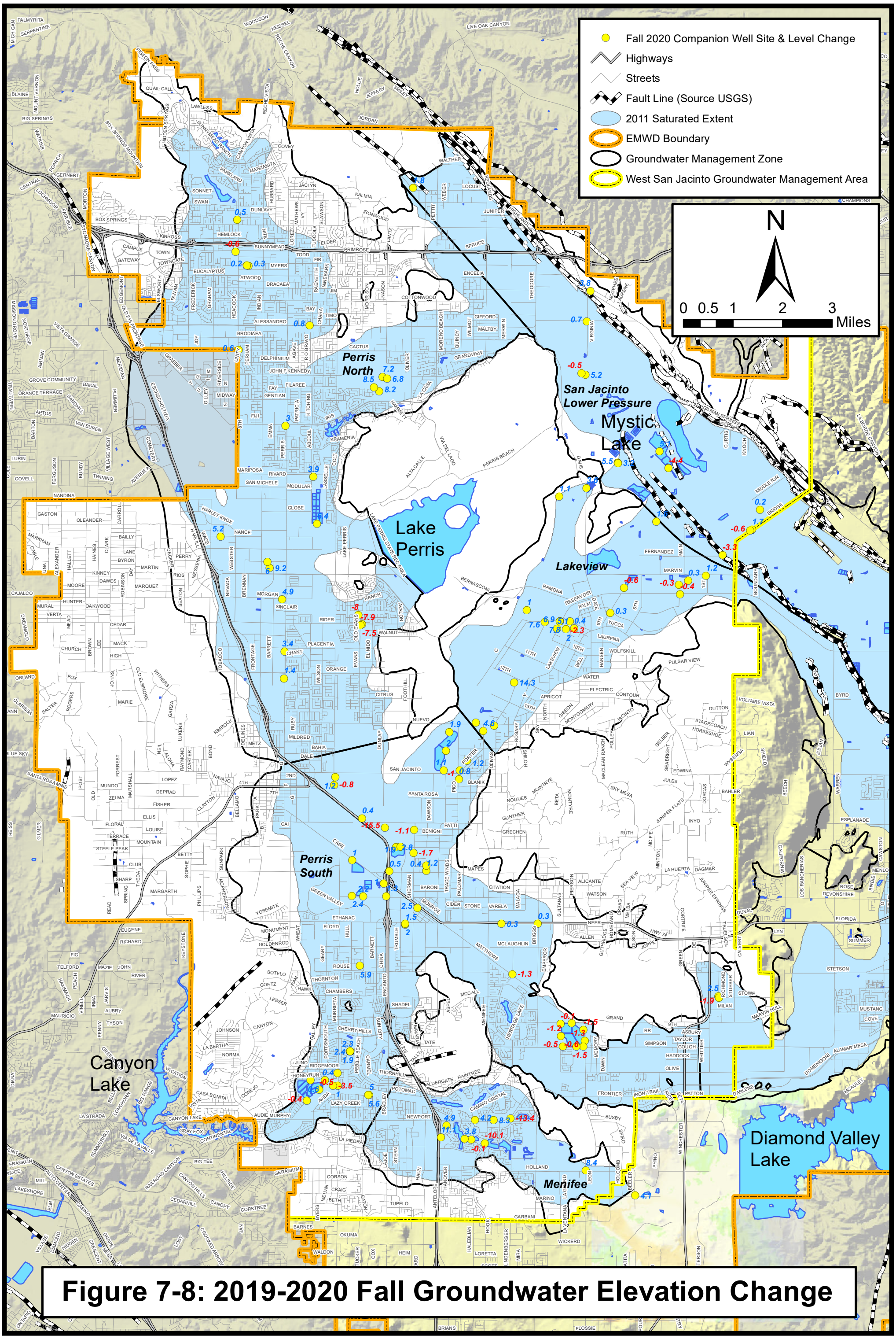


Figure 7-8: 2019-2020 Fall Groundwater Elevation Change

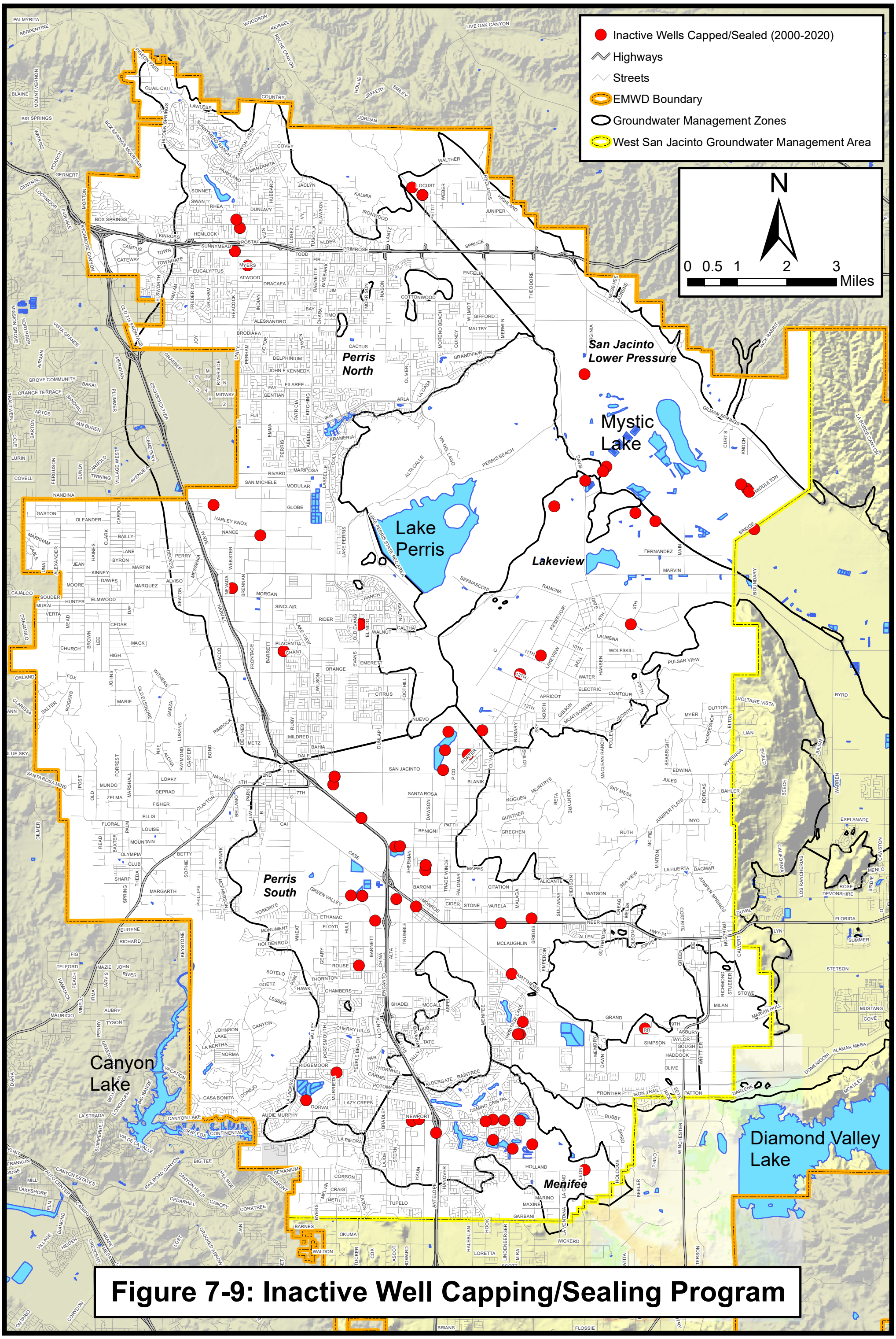


Figure 7-9: Inactive Well Capping/Sealing Program

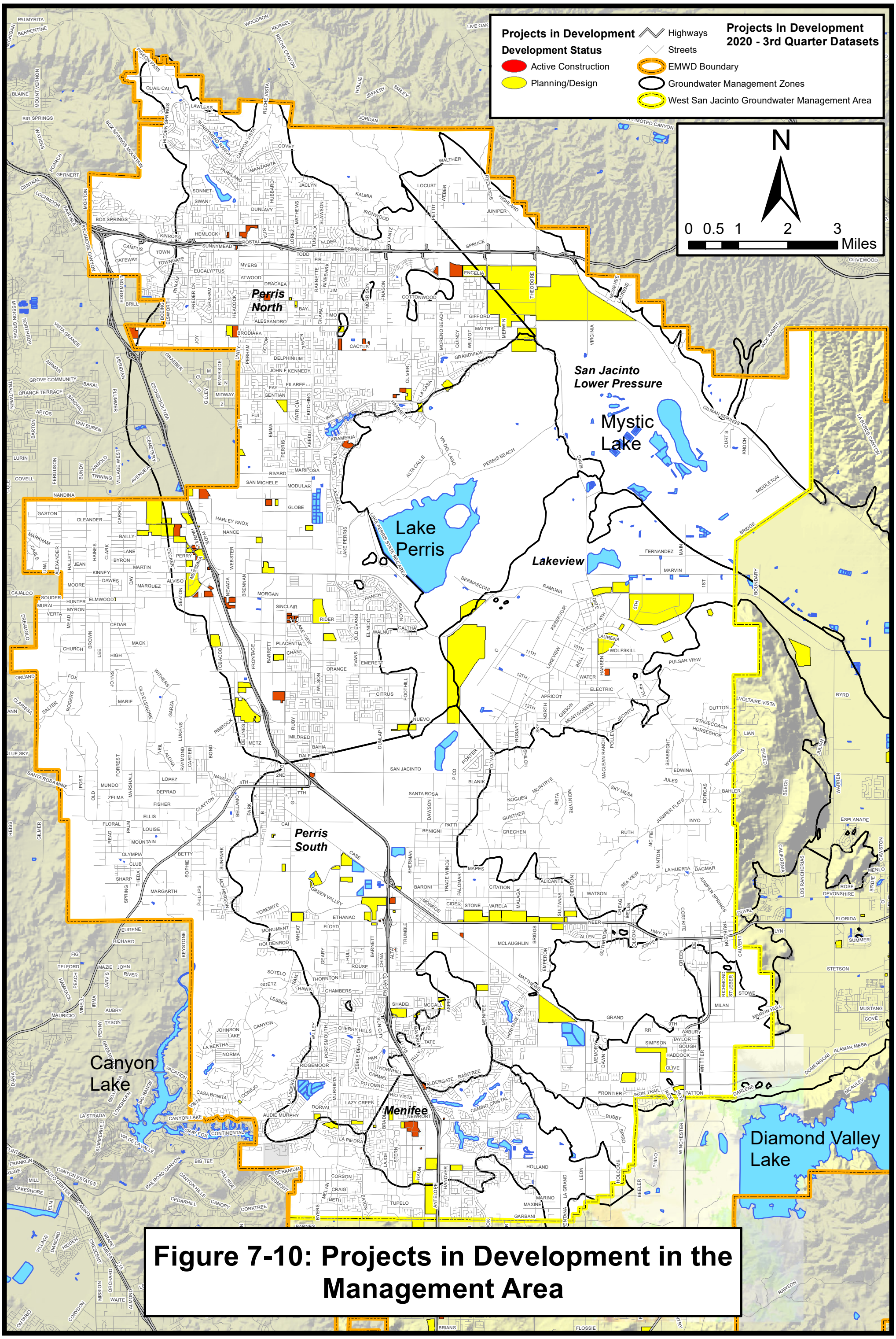


Figure 7-10: Projects in Development in the Management Area

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

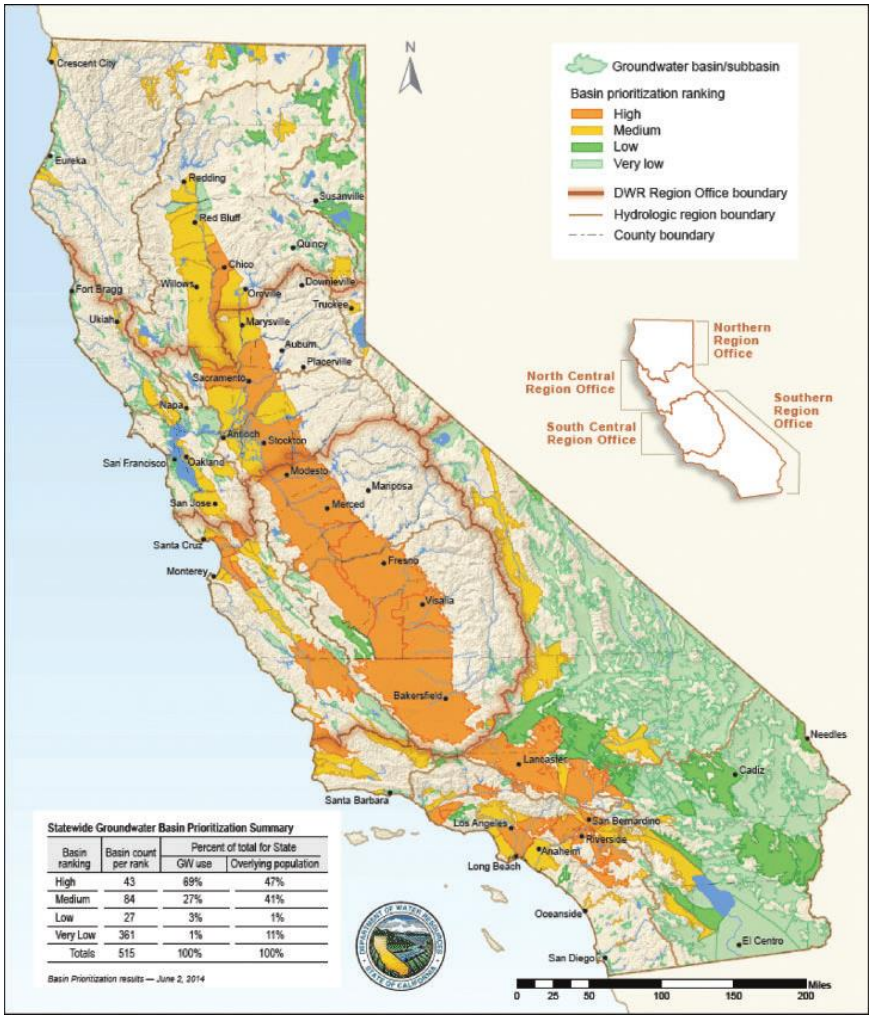
Introduction

- 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

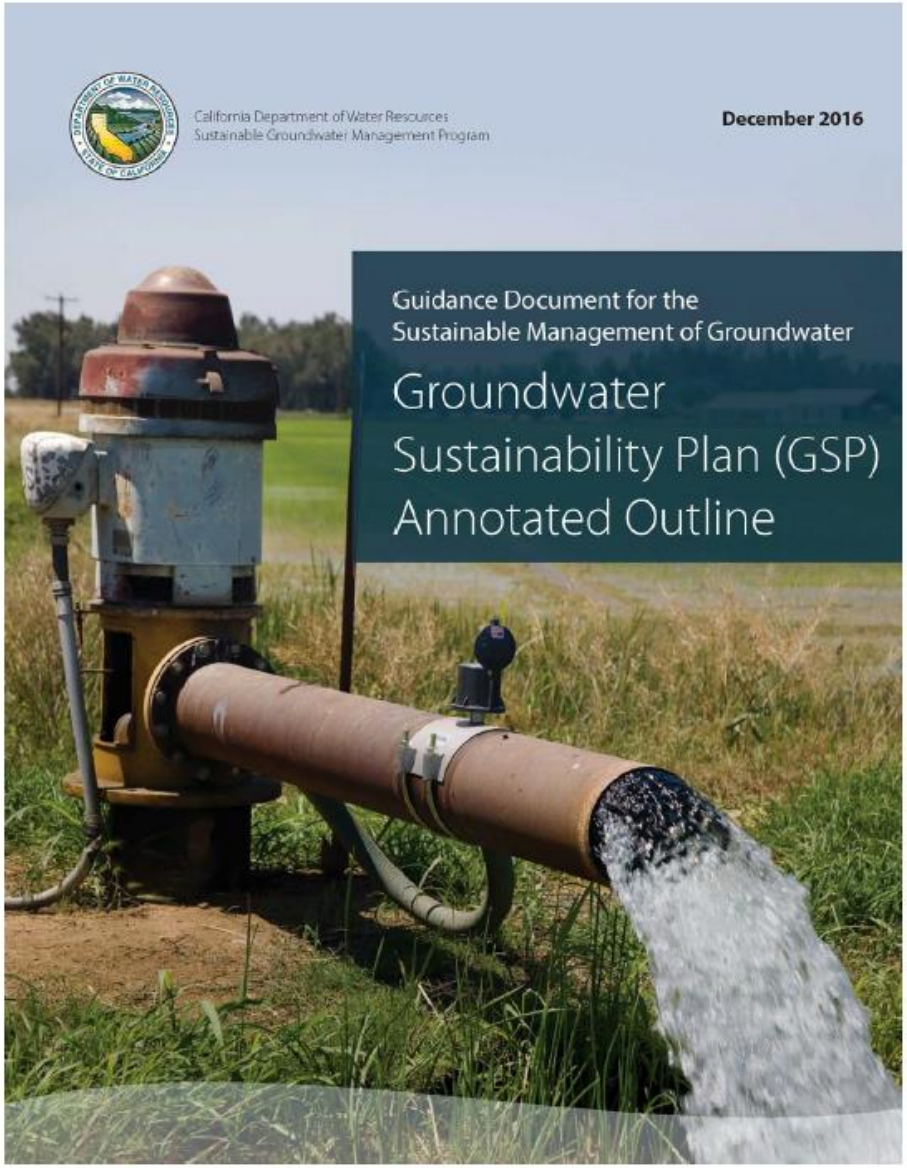
What is the Sustainable Groundwater Management Act?

- 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.

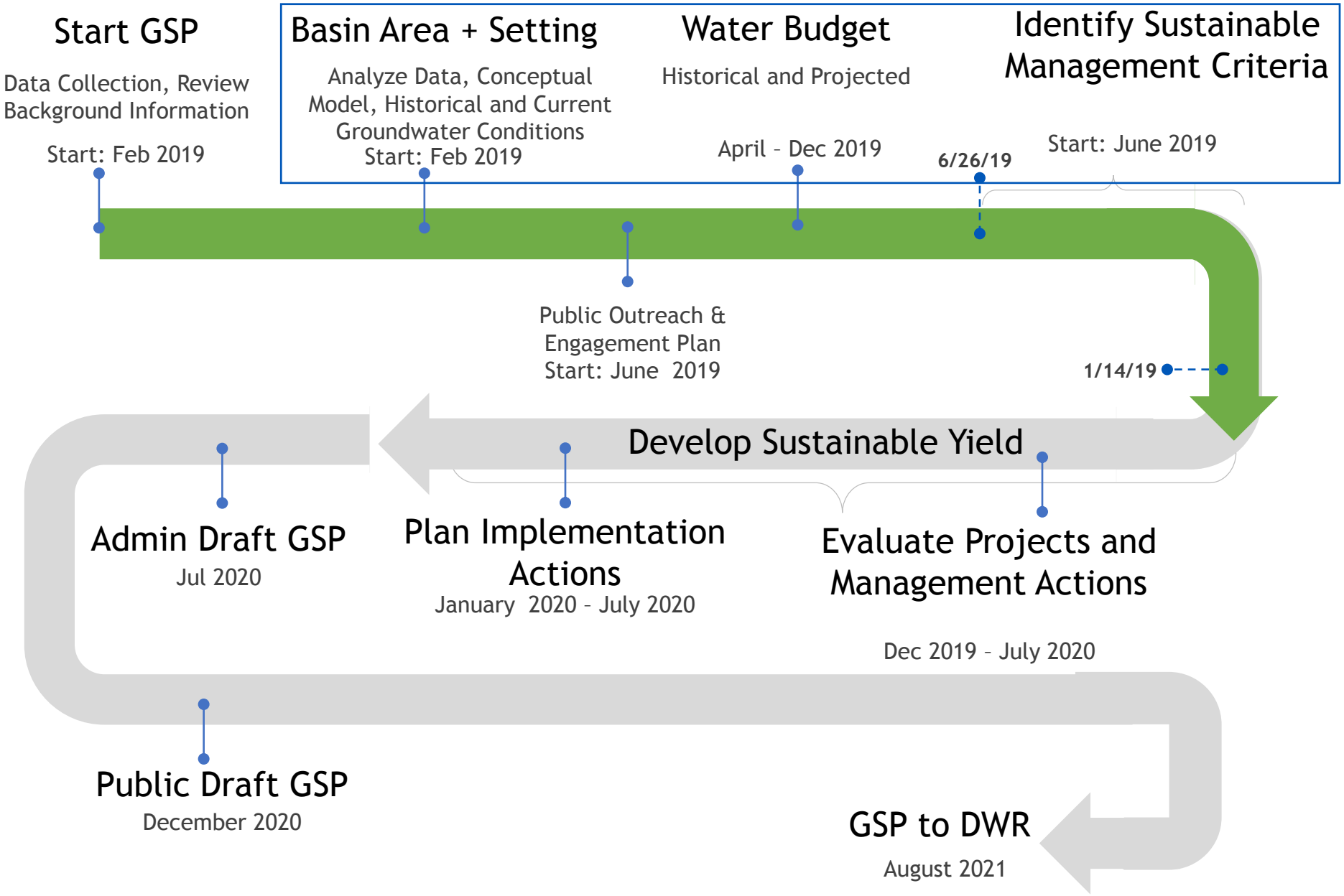


What is a Groundwater Sustainability Plan?

- 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

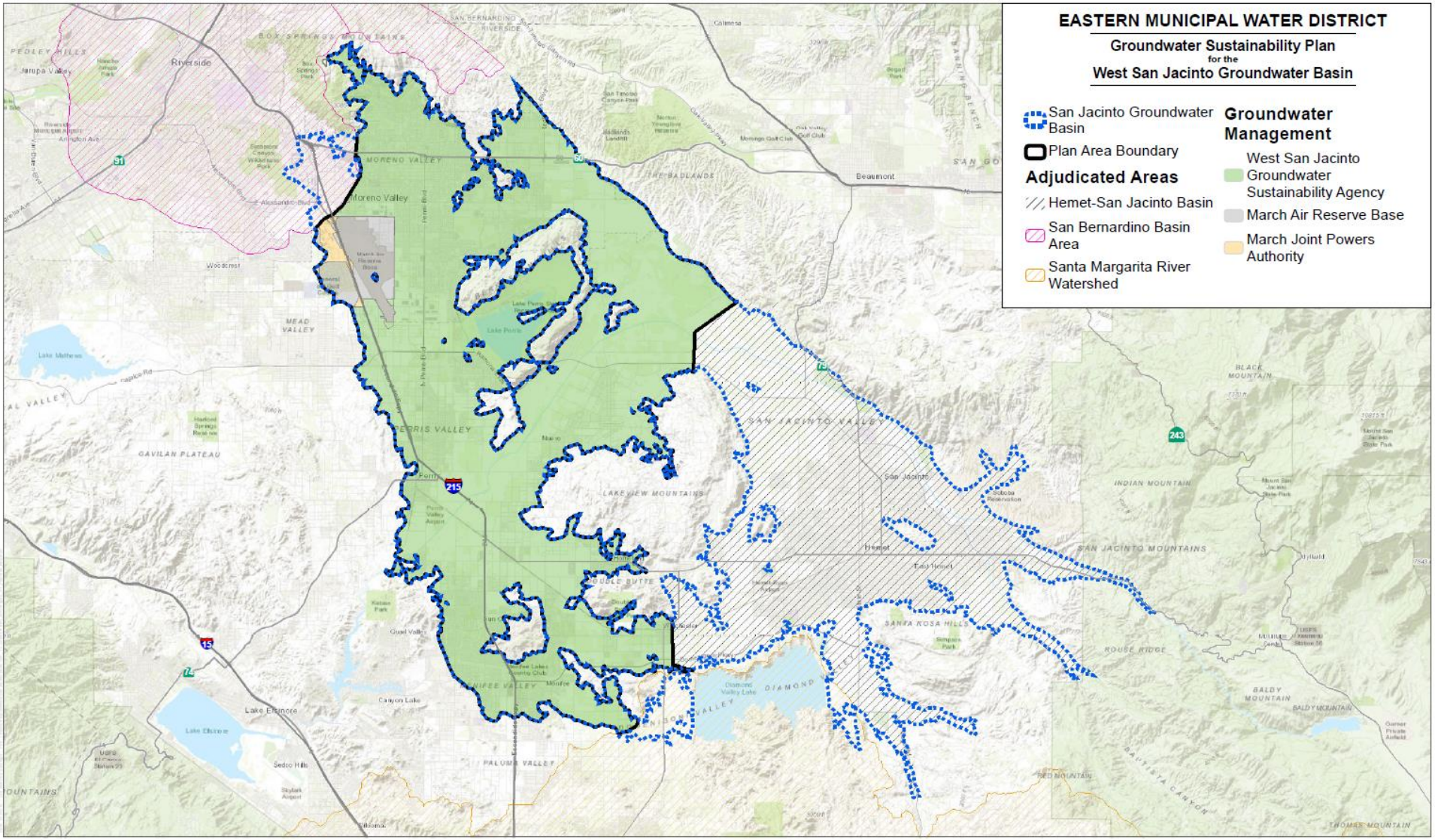


GSP Development Process Update



Update on the Groundwater Sustainability Plan Development

West San Jacinto Groundwater Basin (WSJGB)



West San Jacinto Groundwater Basin (WSJGB)

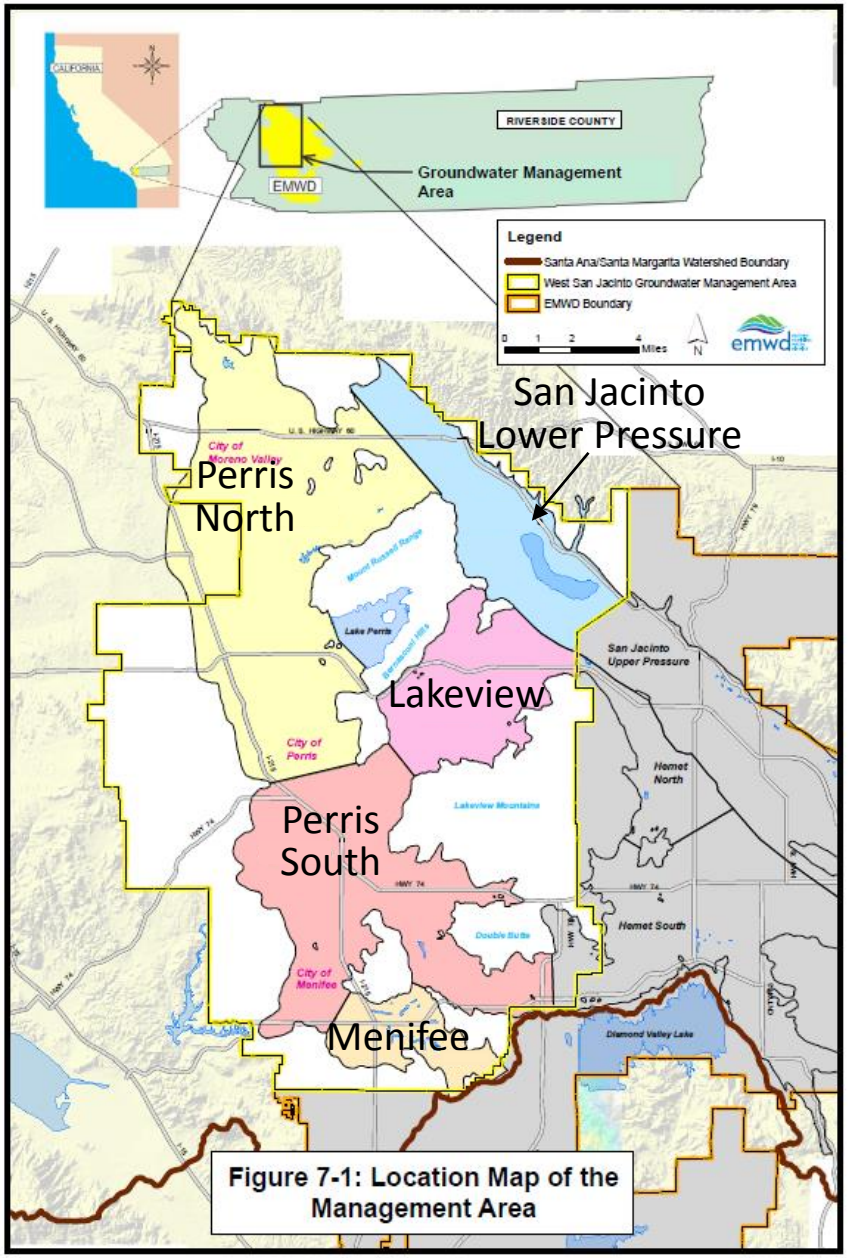
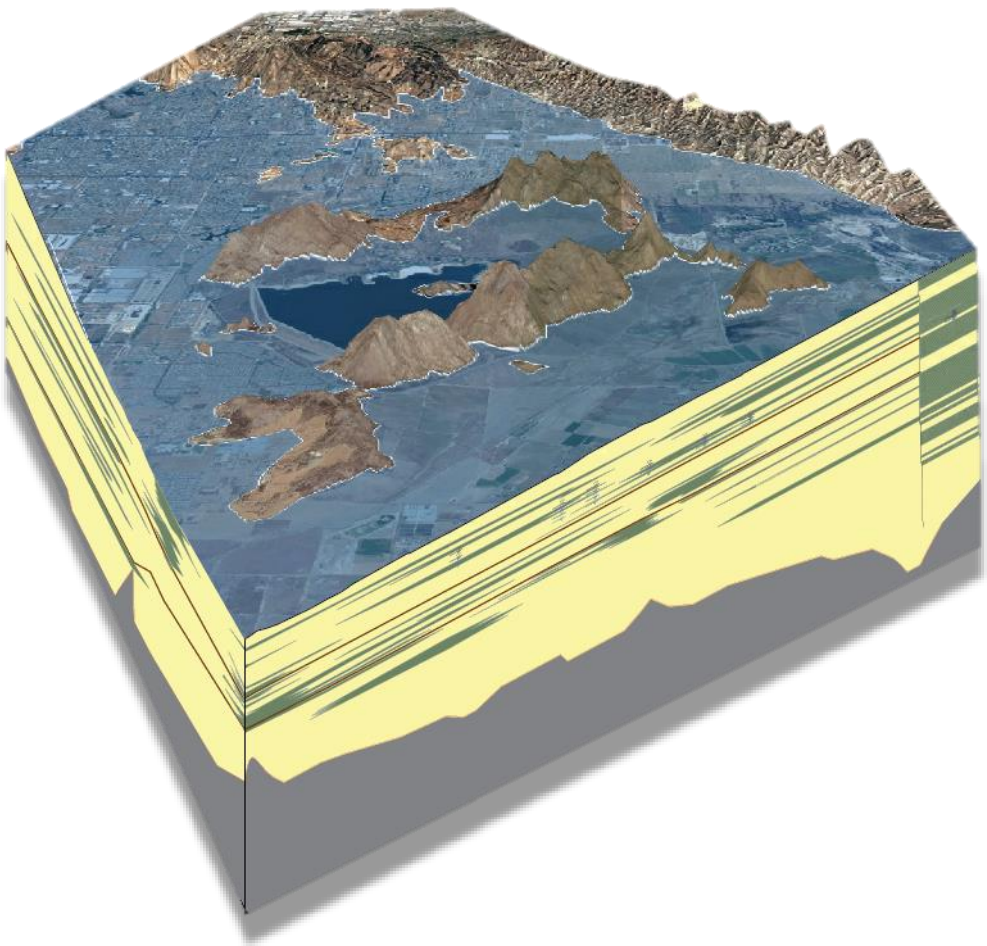


Figure 7-1: Location Map of the Management Area

- 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

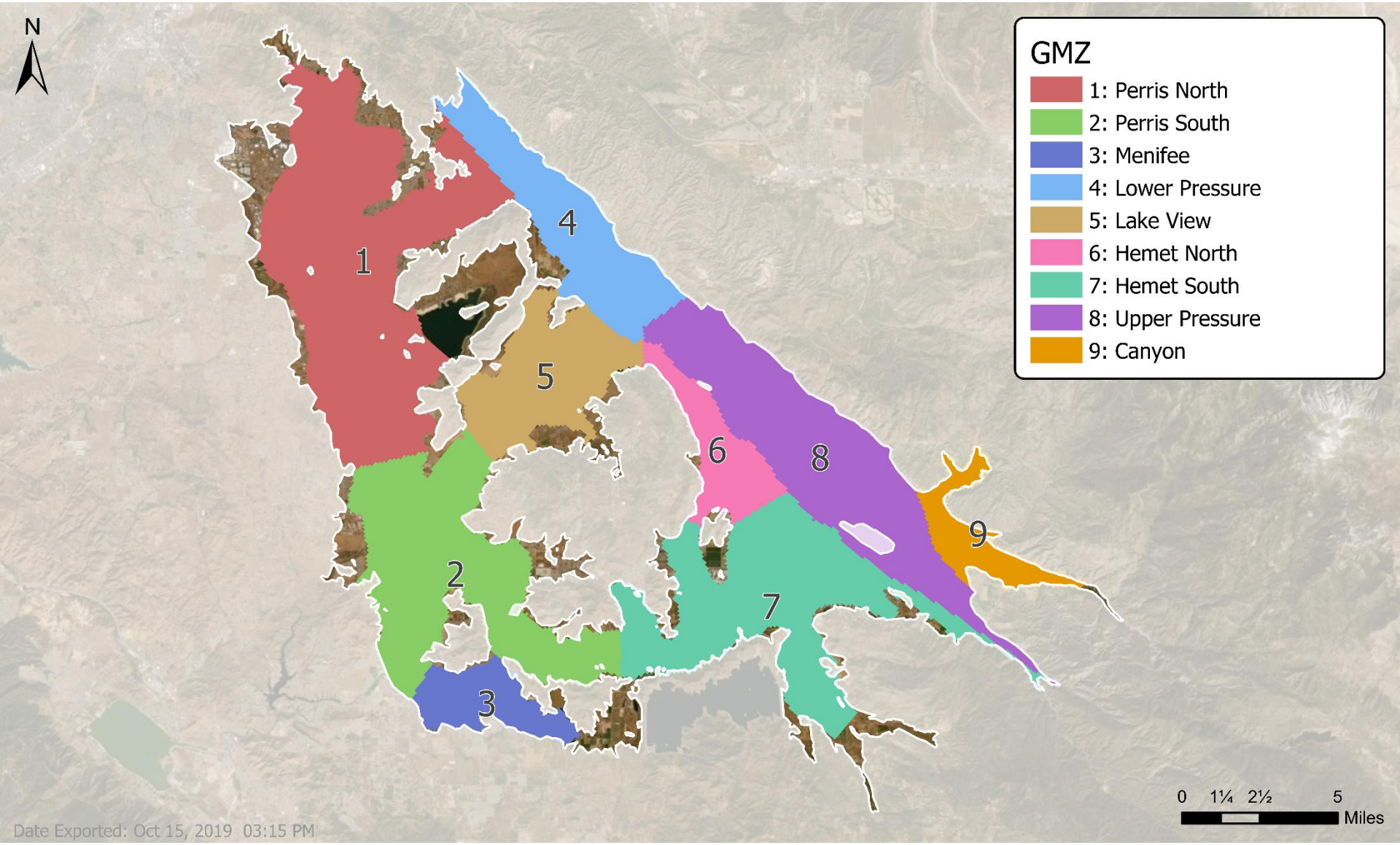


Gravel, Sand, Silty Sand, Clayey Sand

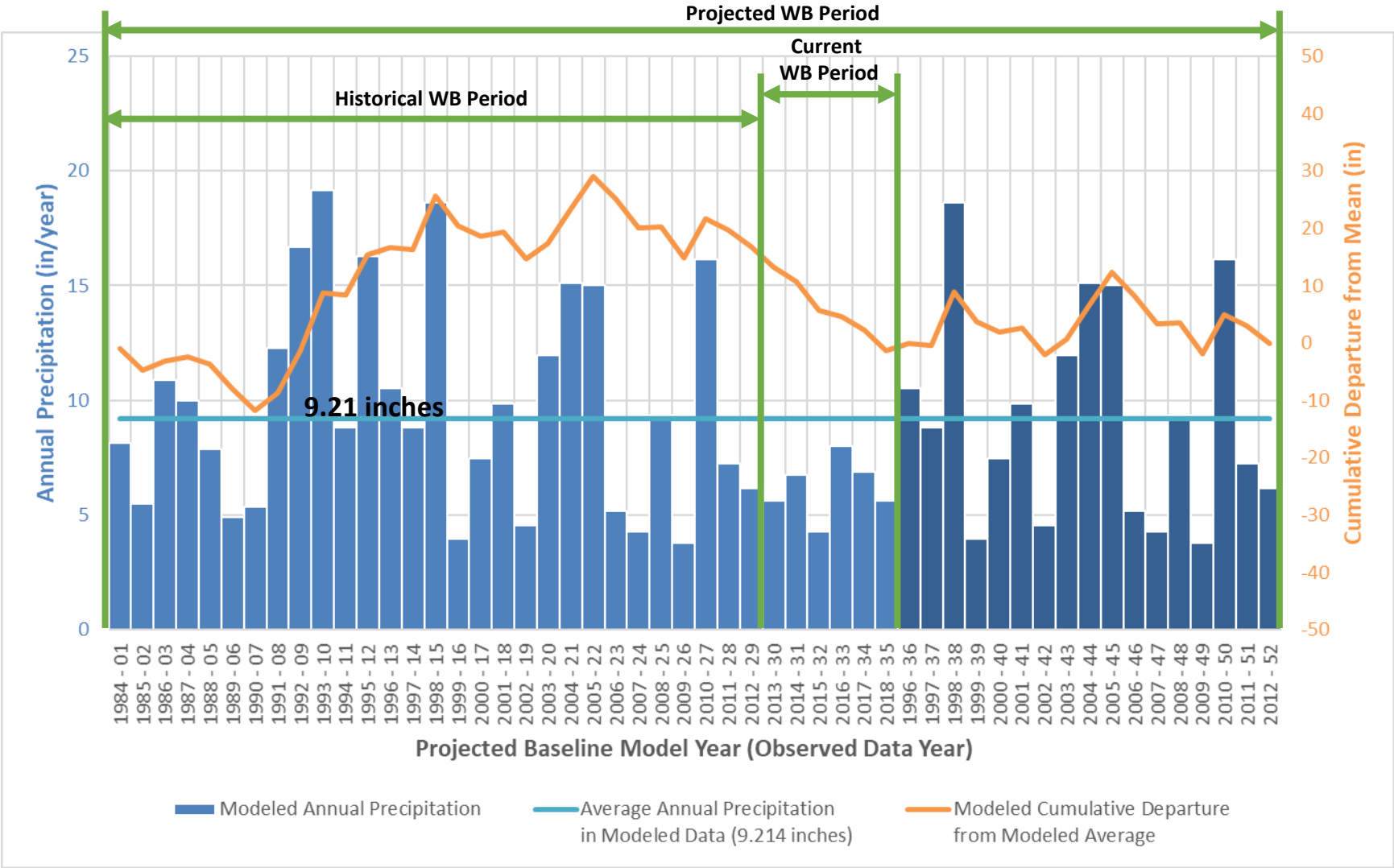
Clay, Sandy Clay, Silty Clay, Gravelly Clay

Bedrock

Basin Boundary Adjustments in the Model

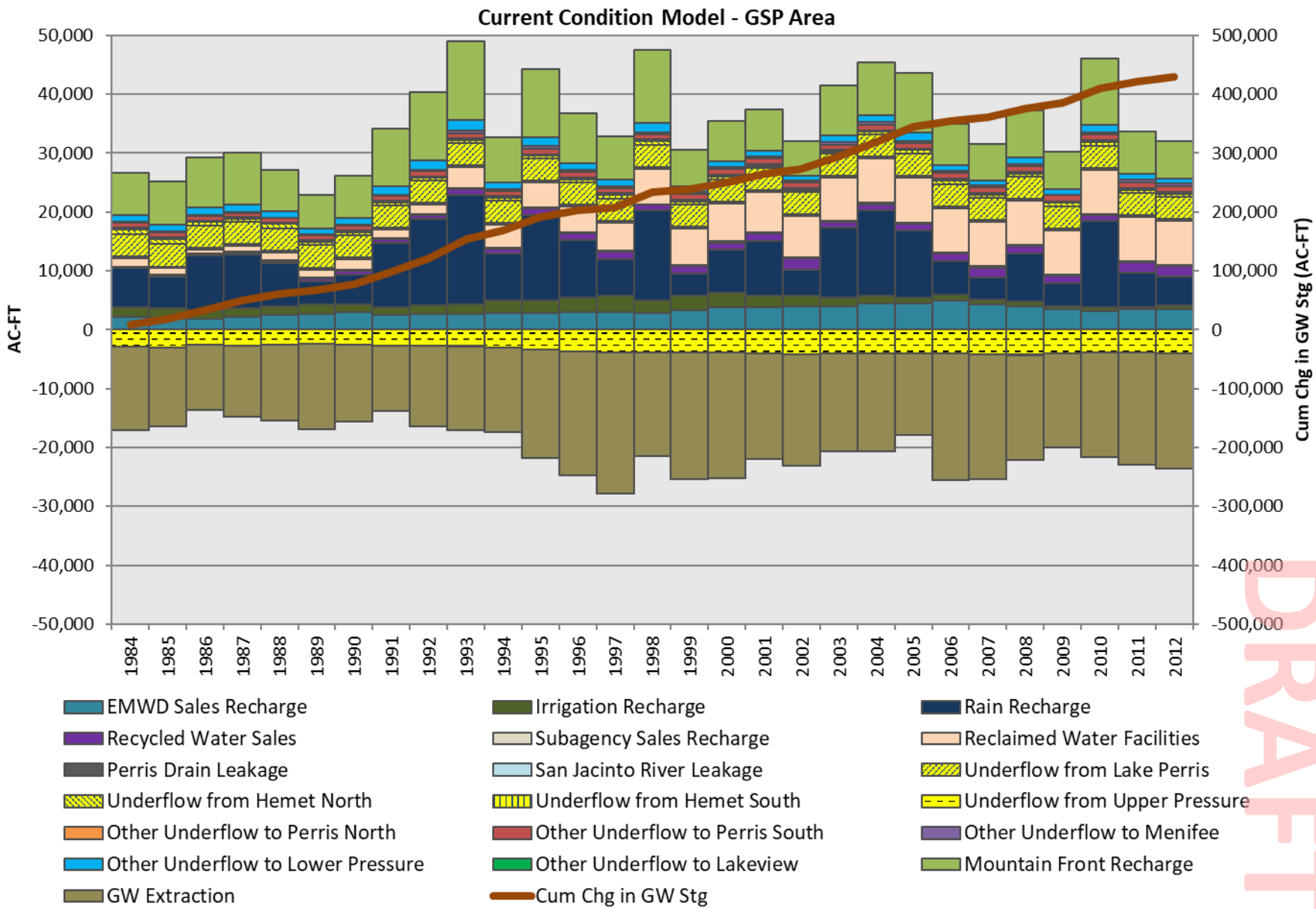


Model Hydrologic Periods



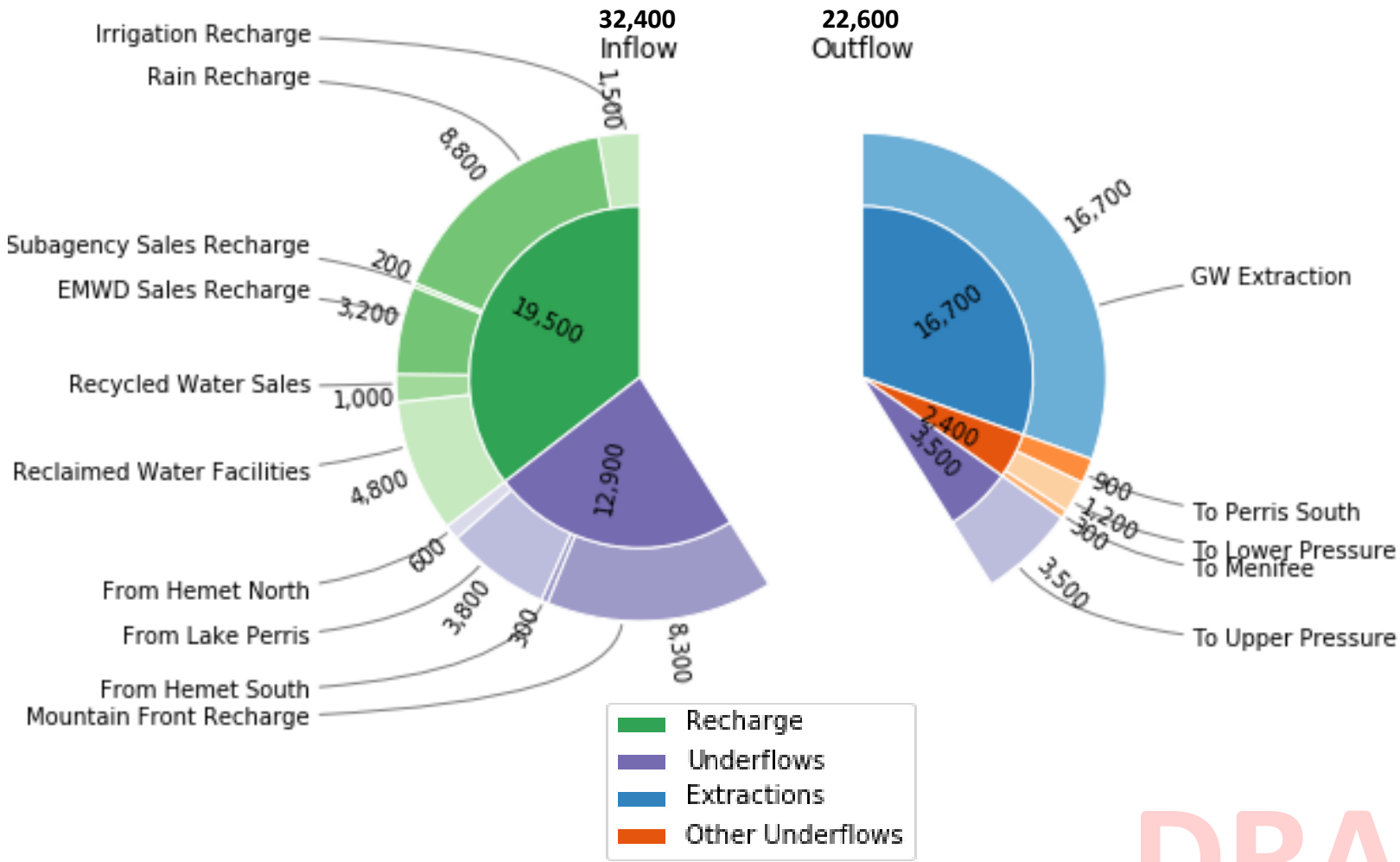
Data Based on Lake Perris Rainfall Gauge

Historical Water Budget – GSP Area



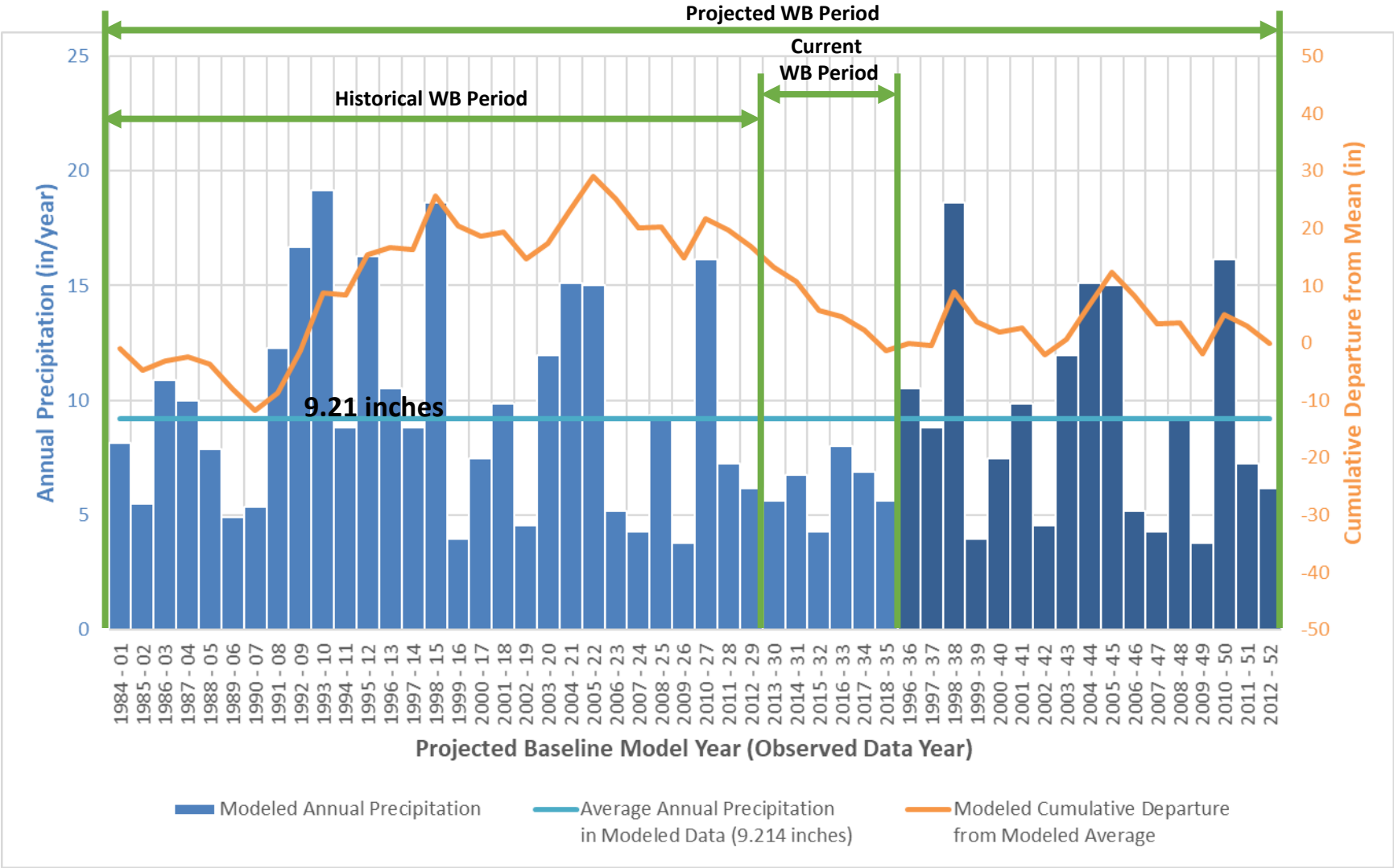
Historical Water Budget – GSP Area

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



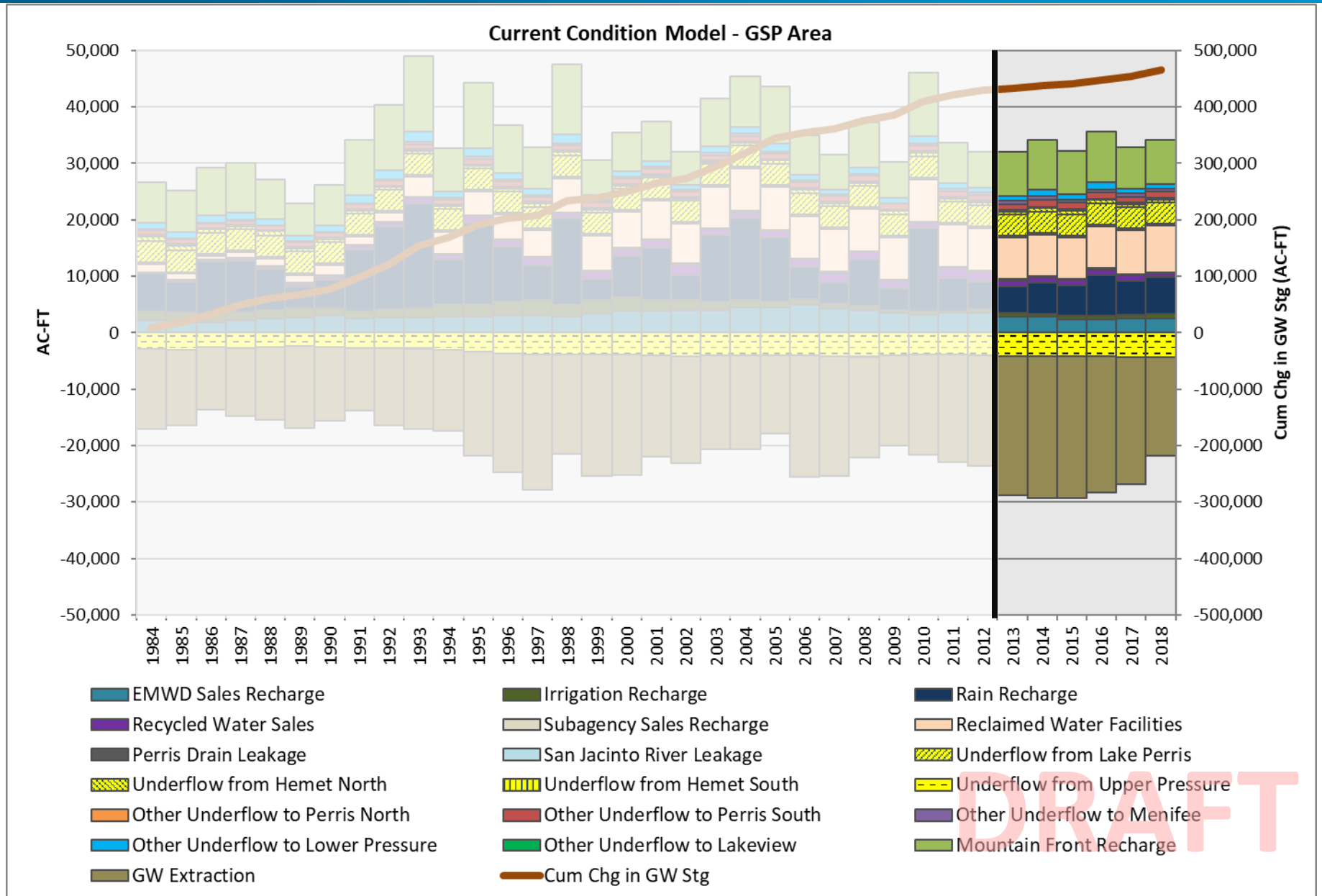
DRAFT

Model Hydrologic Periods



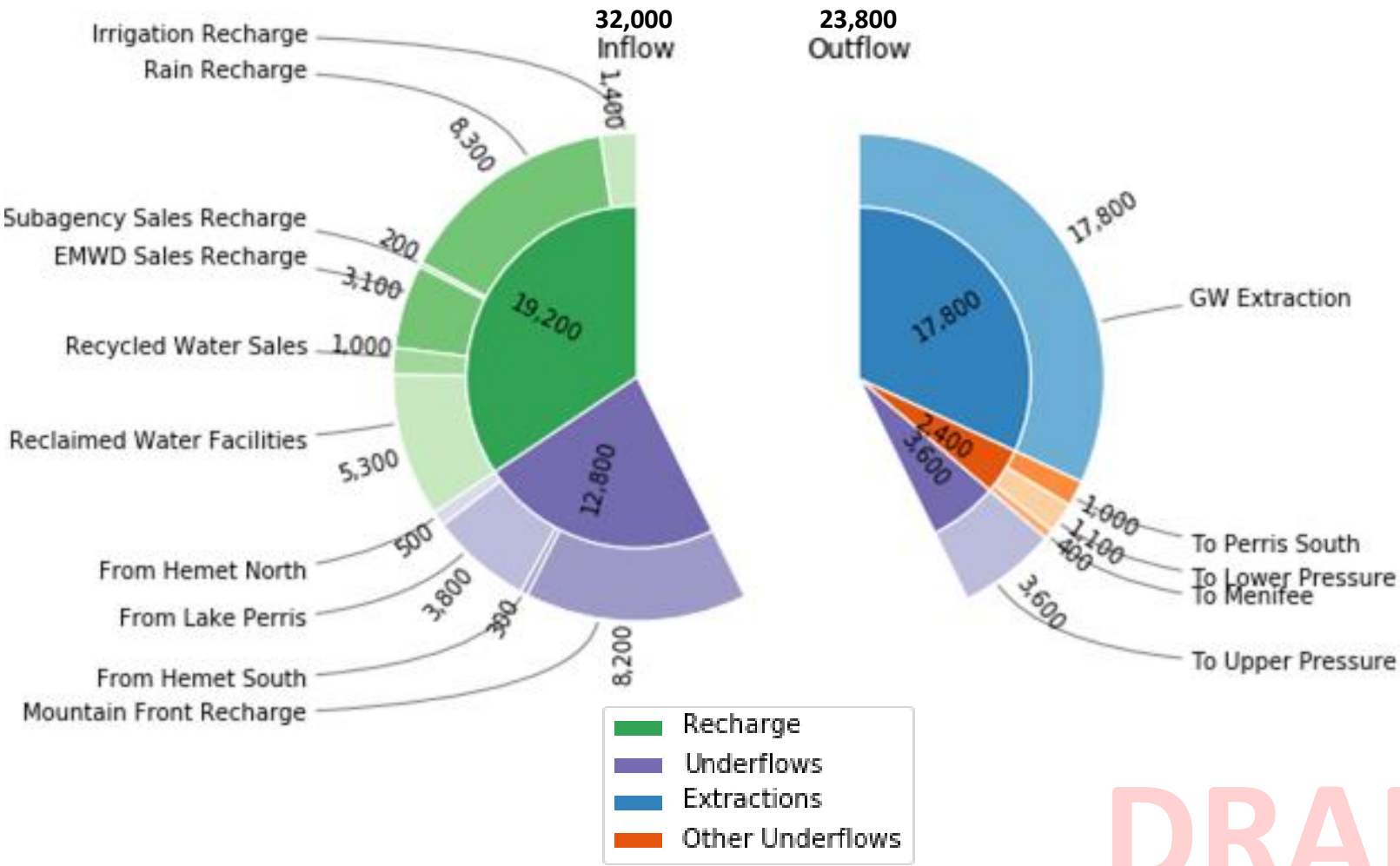
Data Based on Lake Perris Rainfall Gauge

Current Conditions Baseline – GSP Area



Current Conditions GW Budgets

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



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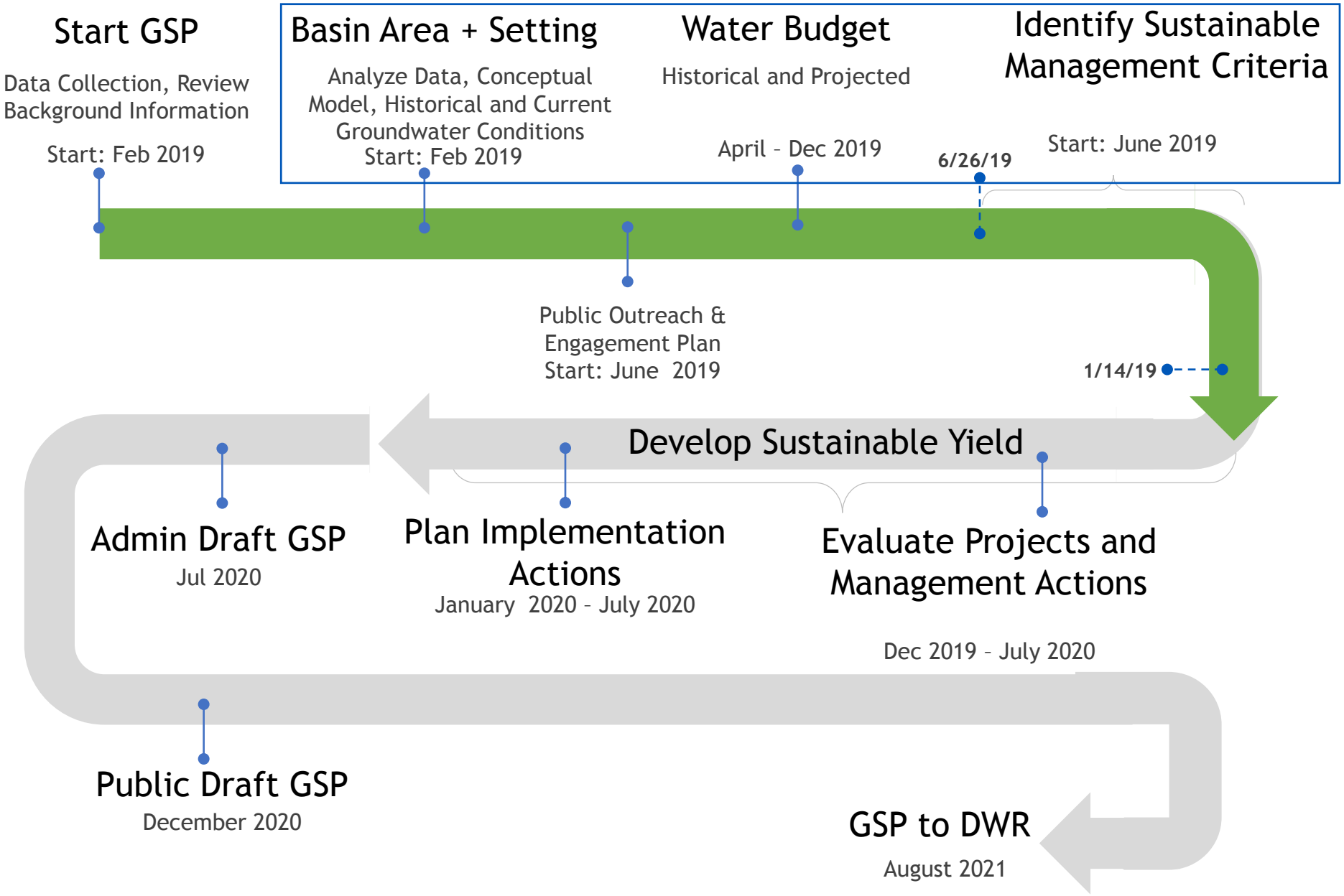
Units: AF/Yr

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?

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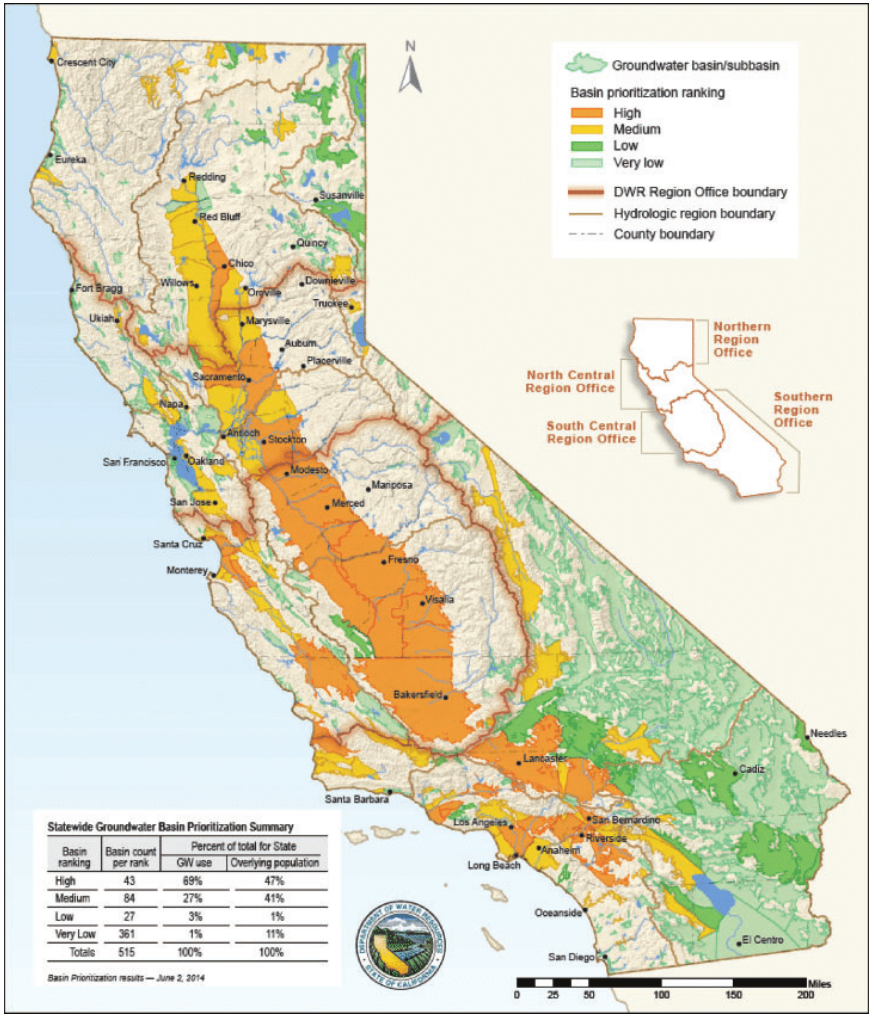
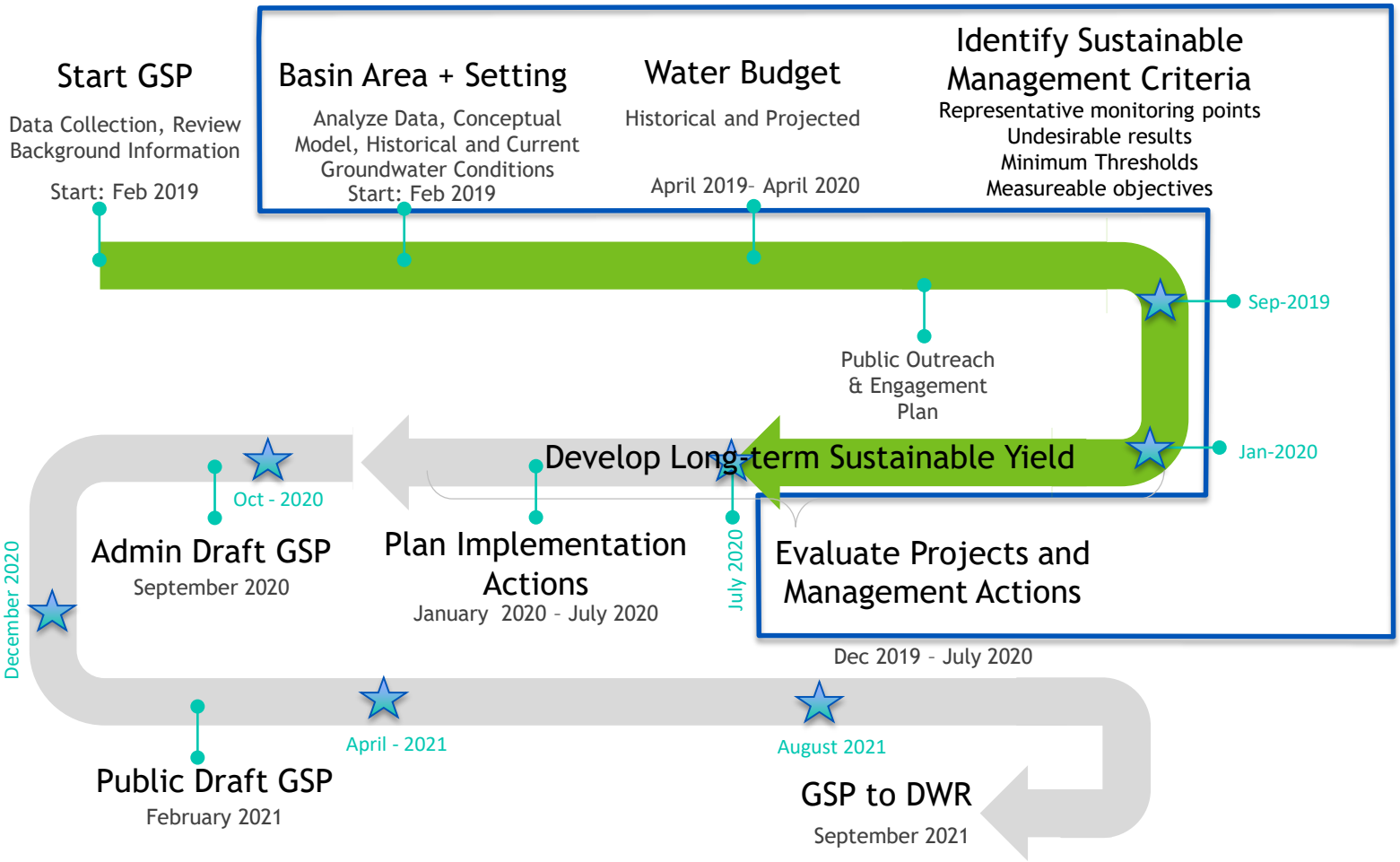


Statewide Groundwater Basin Prioritization Summary

Basin ranking	Basin count per rank	Percent of total for State	
		GW use	Overlying population
High	43	69%	47%
Medium	84	27%	41%
Low	27	3%	1%
Very Low	361	1%	11%
Totals	515	100%	100%

Basin Prioritization results — June 2, 2014

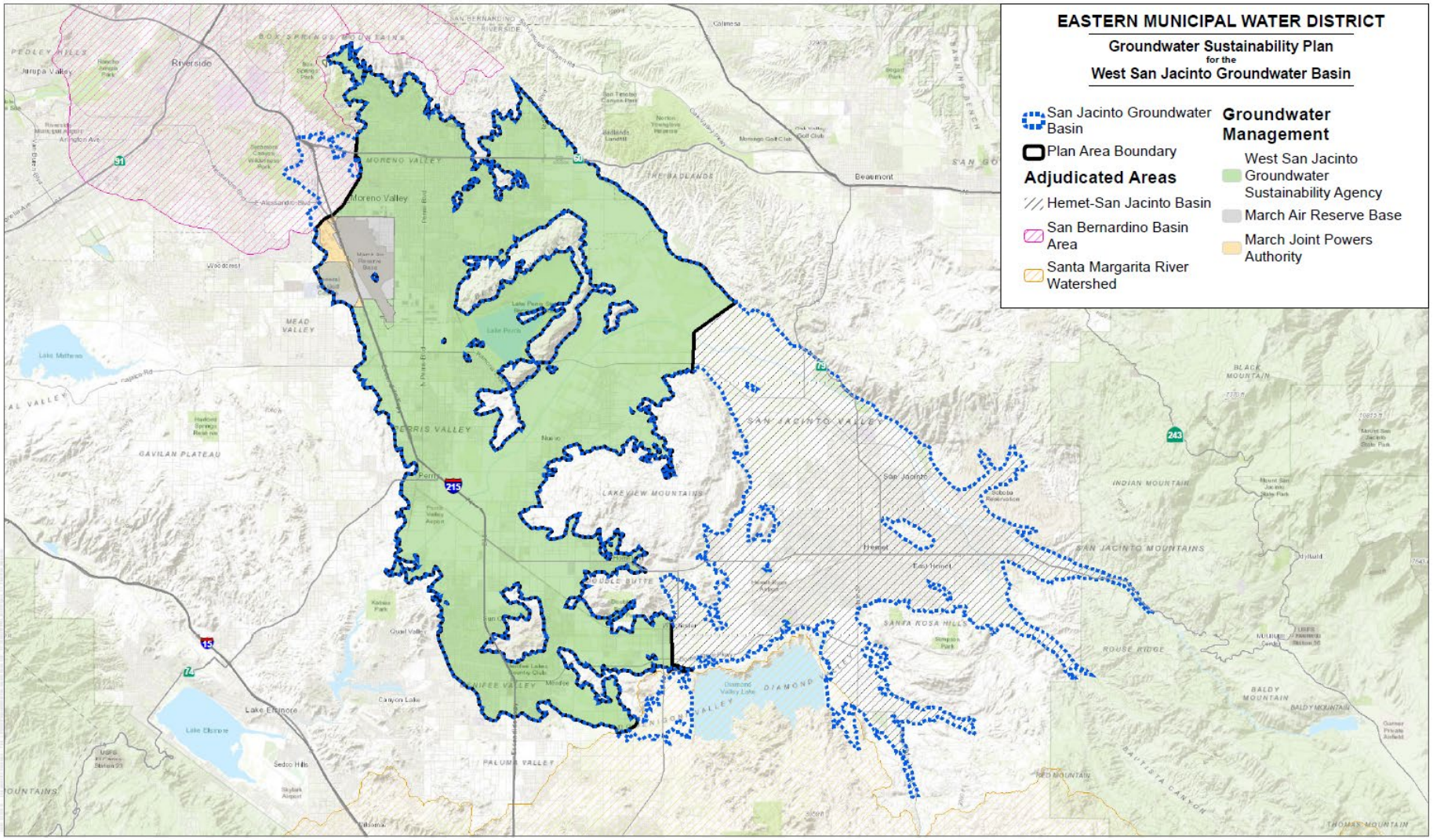
GSP Development Process



Update on the Groundwater Sustainability Plan Development

EASTERN MUNICIPAL WATER DISTRICT

West San Jacinto Groundwater Basin (WSJGB)



Importance of the Monitoring Network

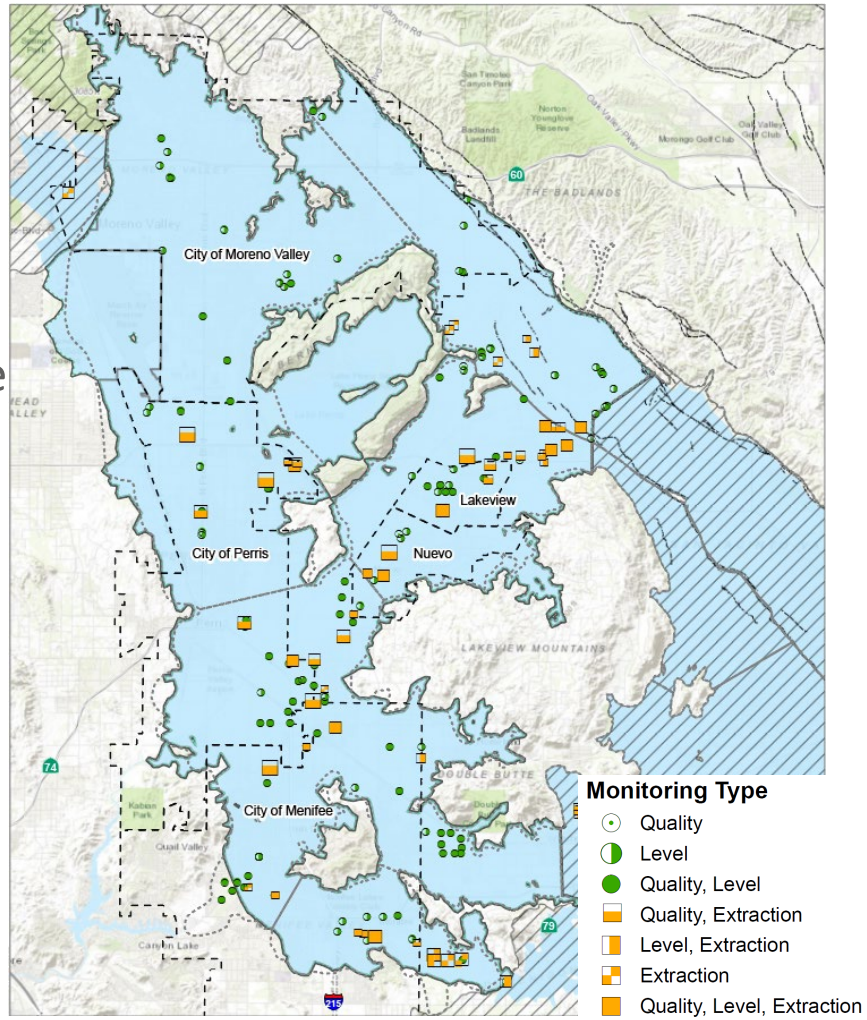
- From the SGMA Emergency Regulations (23 CCR § 354.34. Monitoring Networks):
  - "Each [GSA] shall develop a monitoring network capable of collecting sufficient data to demonstrate short-term, seasonal, and long-term trends in groundwater and related surface water conditions"

- 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

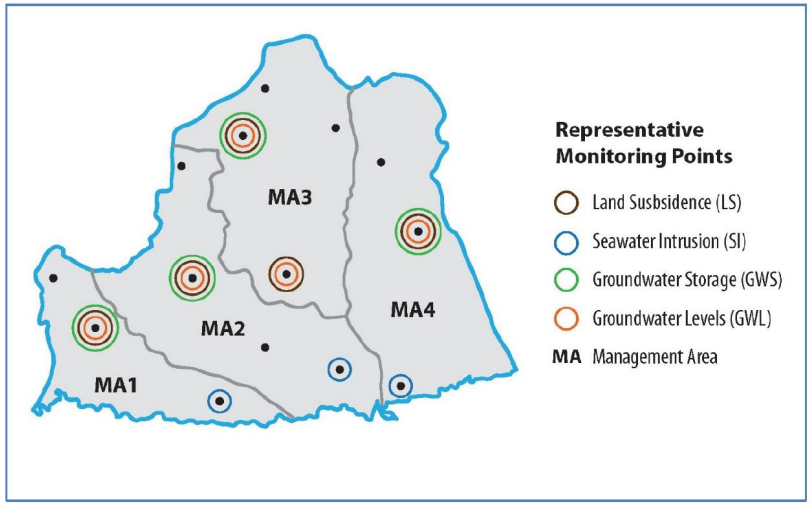
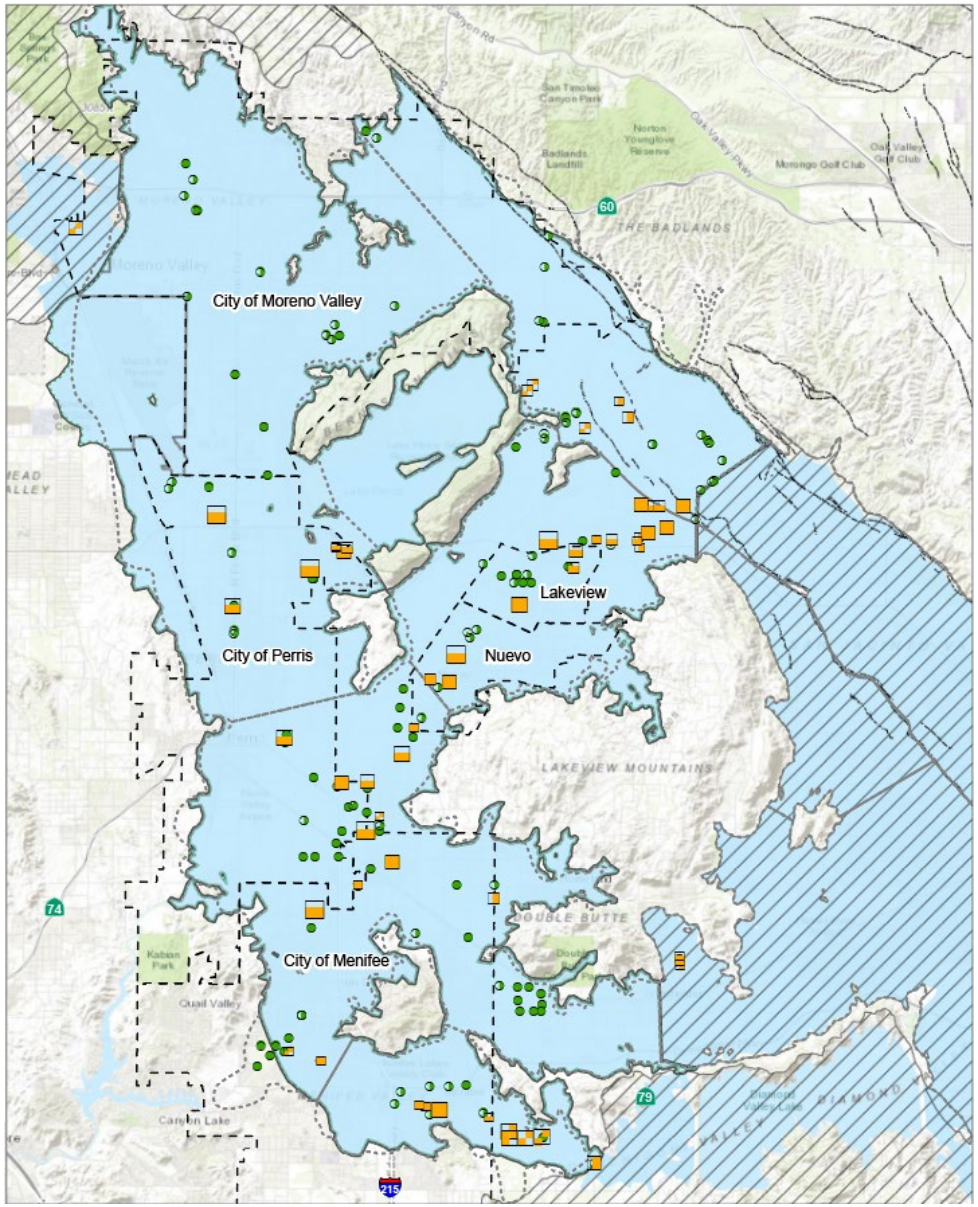


Figure 3: Representative Monitoring Points

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

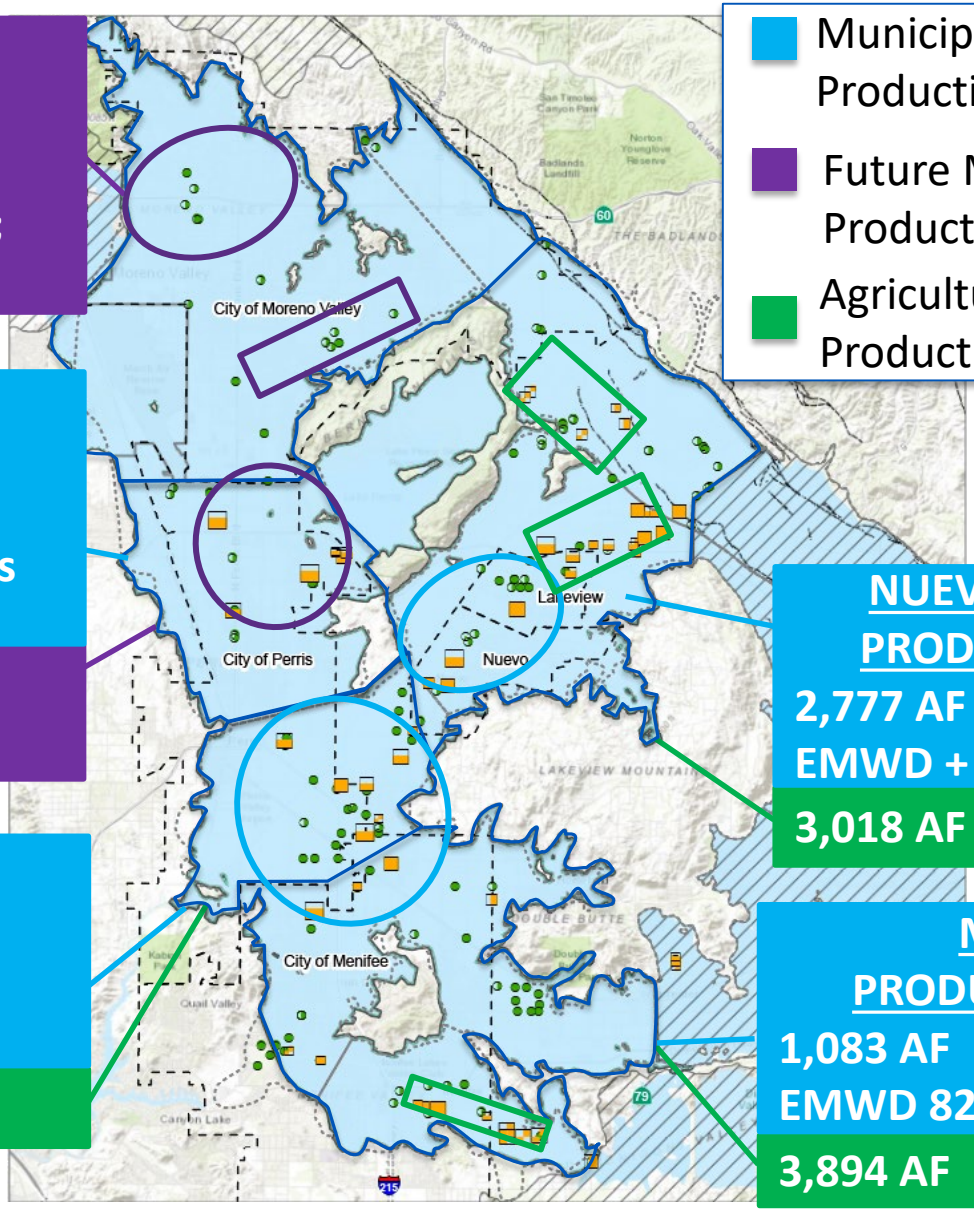
1,947 AF
EMWD + Liberty Utilities (Park Water)

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

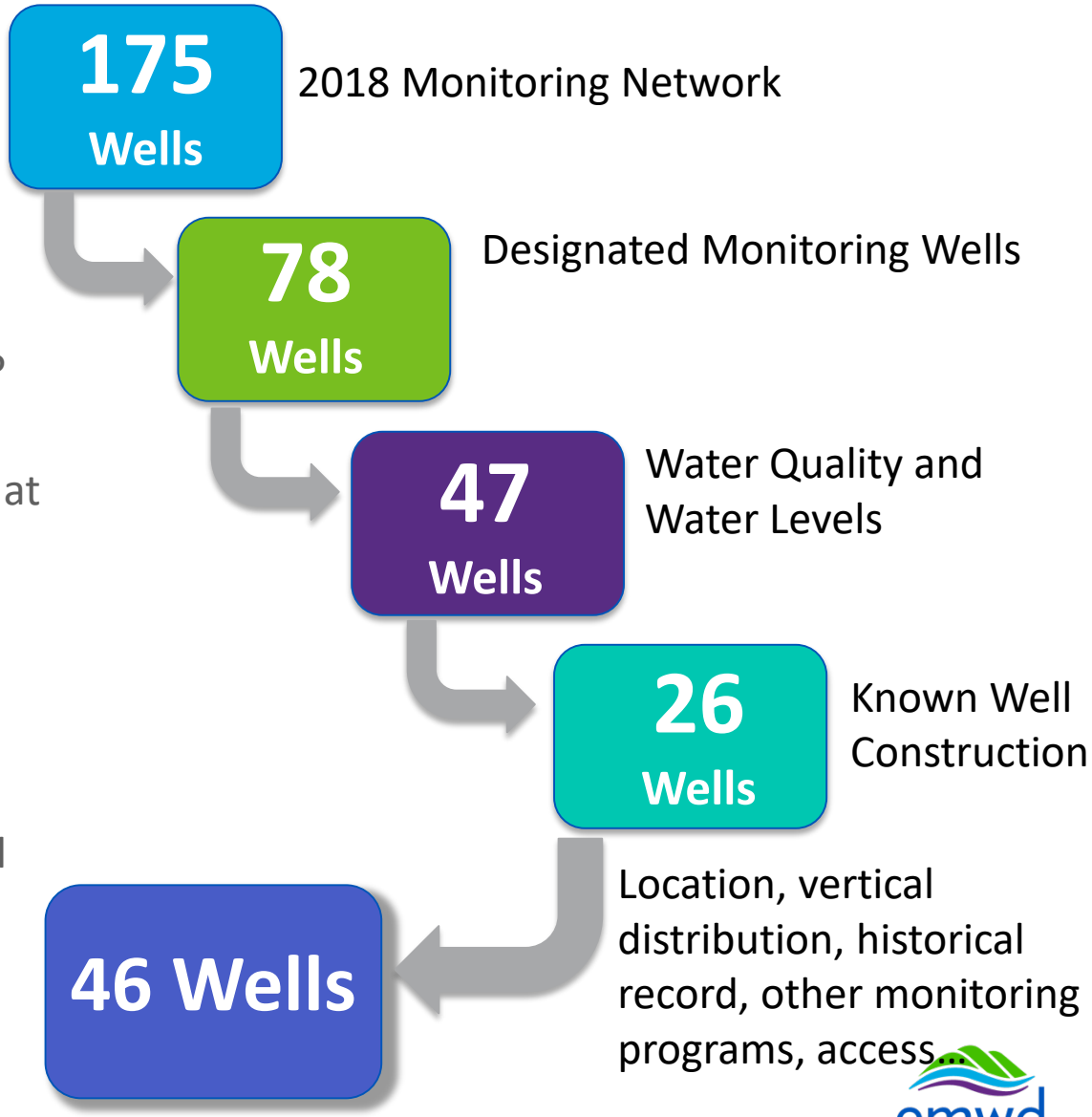
MENIFEE PRODUCTION AREA

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



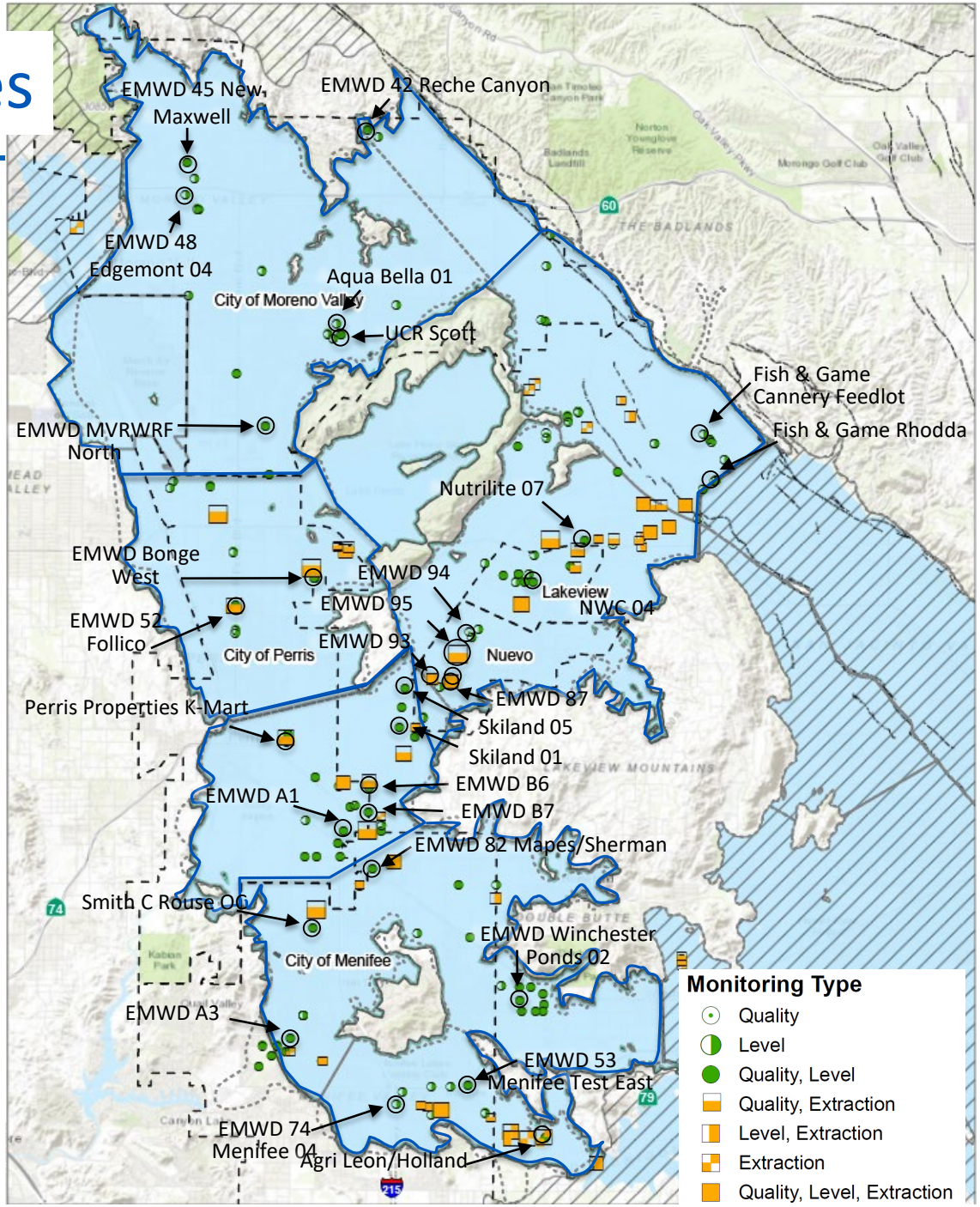
Site Ranking

- 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

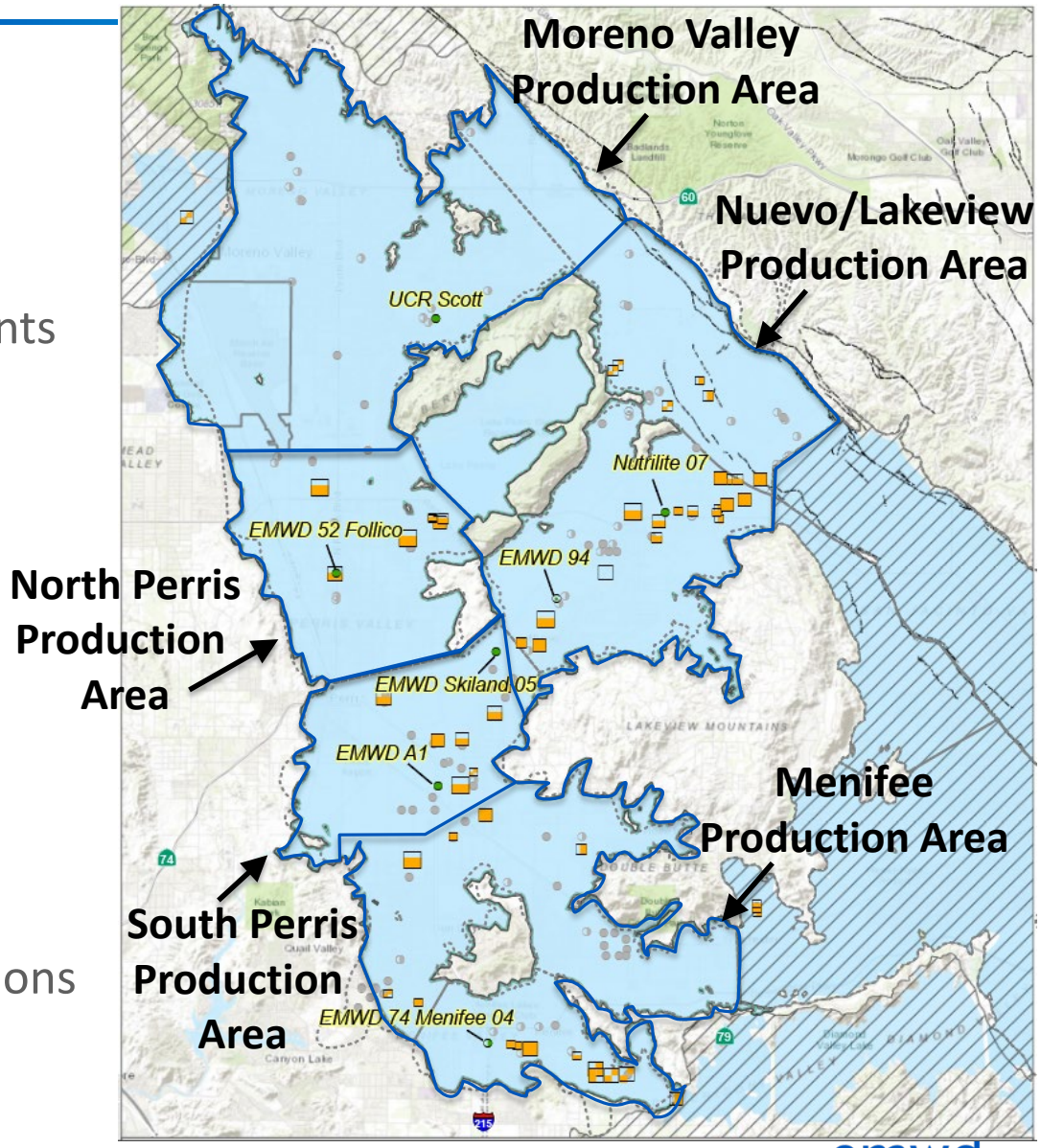
Higher Ranked Sites

- 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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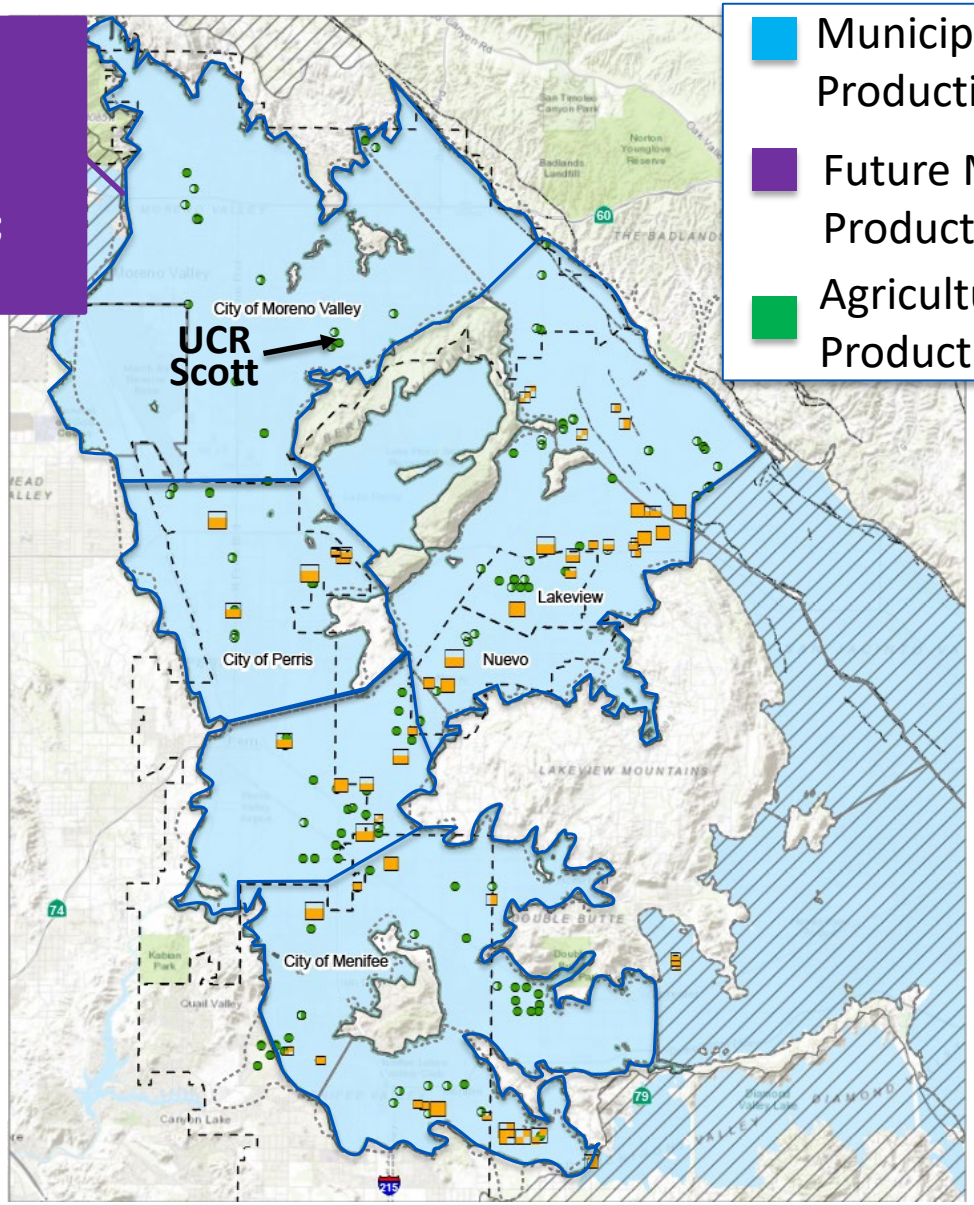
Production Areas

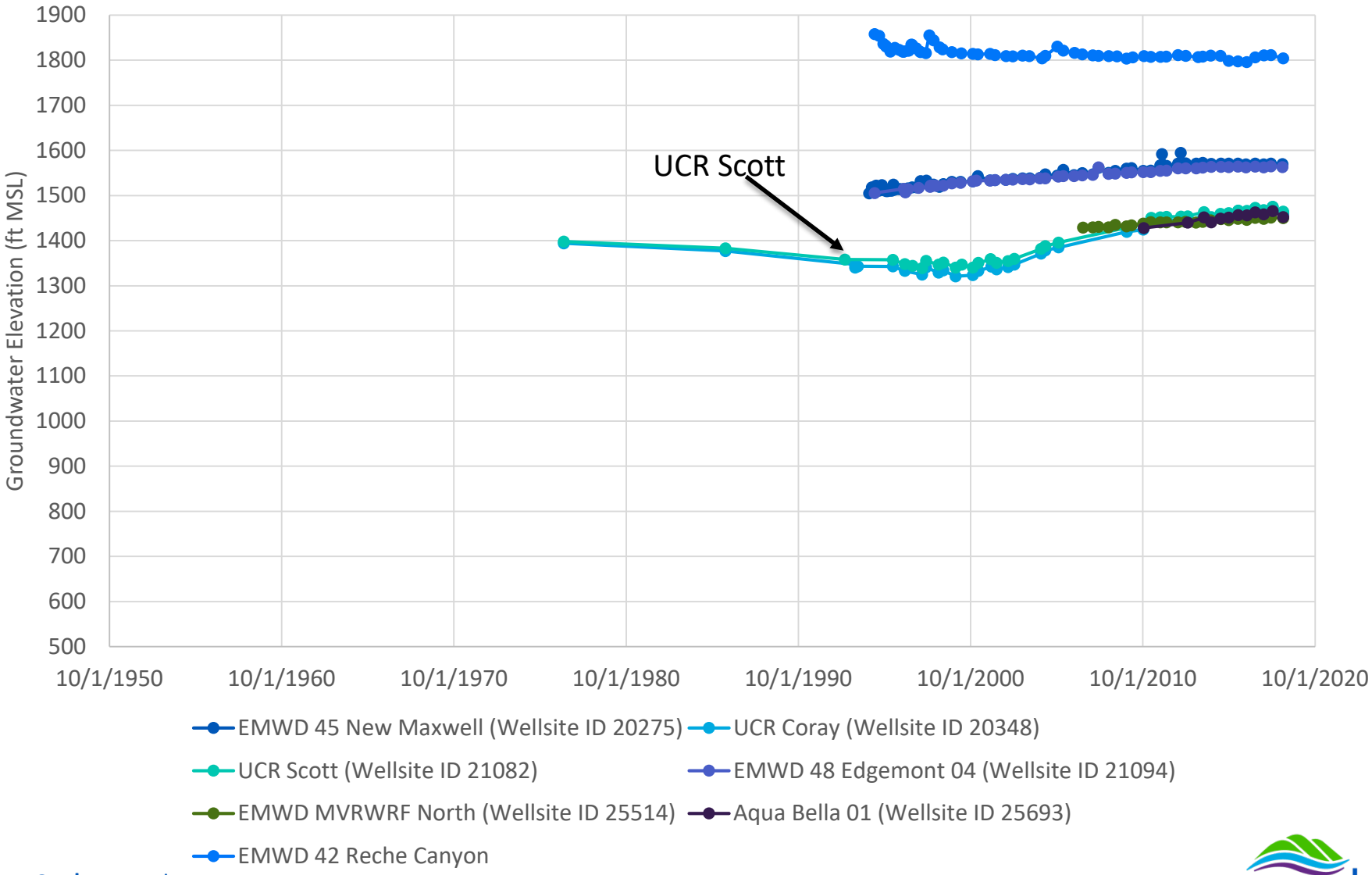
MORENO VALLEY PRODUCTION AREA

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

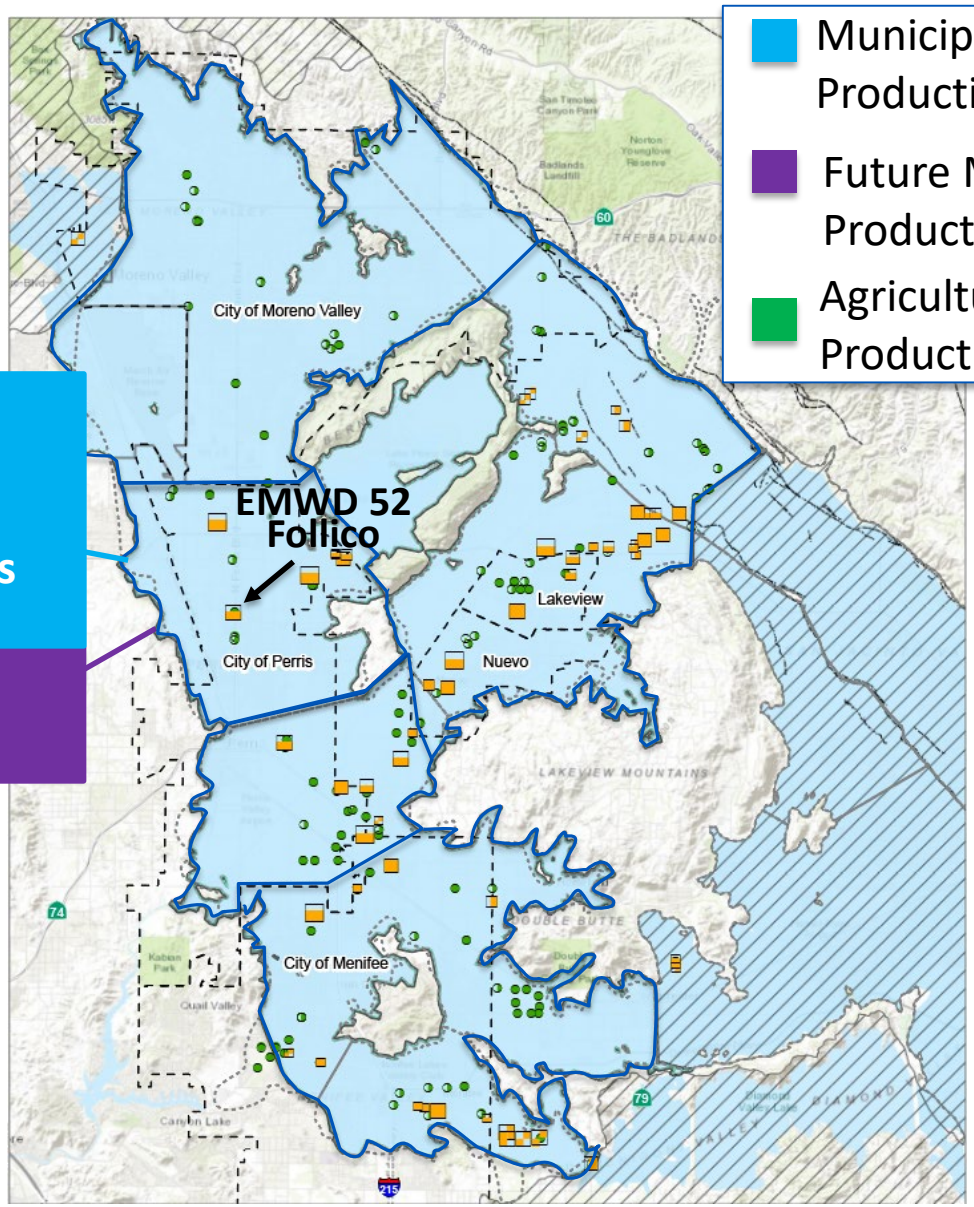


- Municipal Calendar Year Production 2019
- Future Municipal Production
- Agricultural / Private Production 2019

Water Levels: Moreno Valley Production Area



Production Areas



Municipal Calendar Year Production 2019

Future Municipal Production

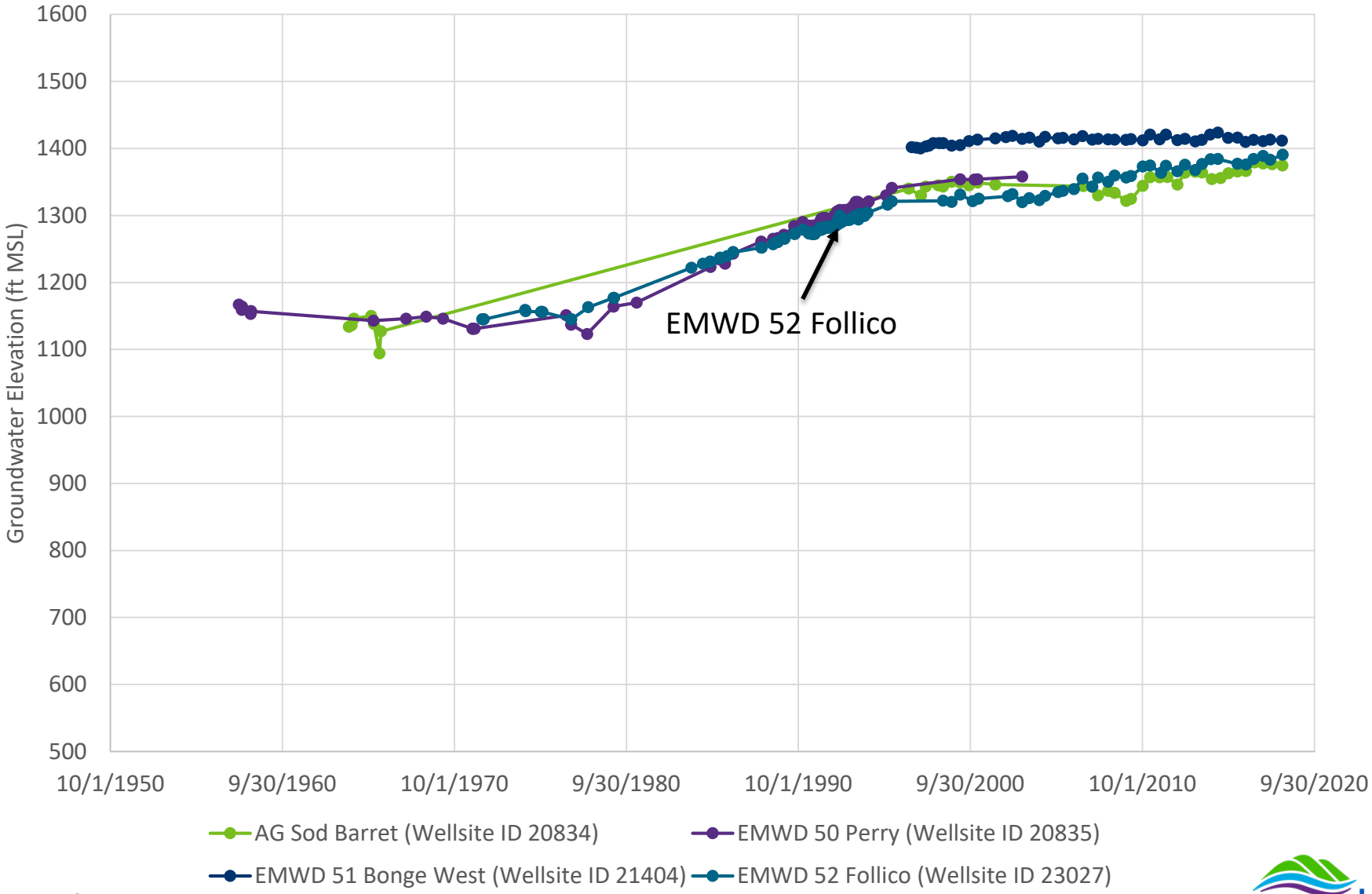
Agricultural / Private Production 2019

NORTH PERRIS PRODUCTION AREA

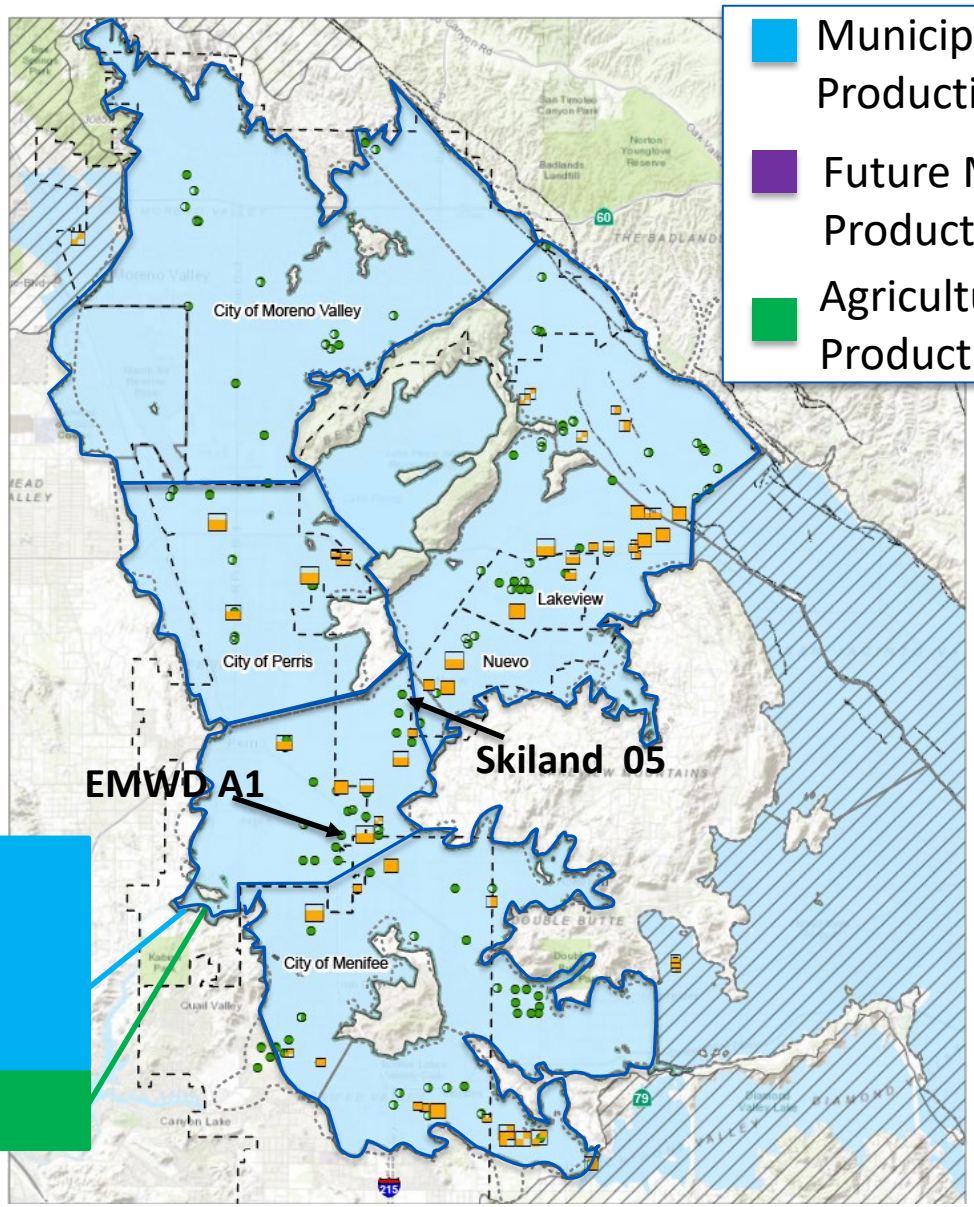
1,947 AF
EMWD + Liberty Utilities (Park Water)

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

Water Levels: North Perris Production Area



Production Areas



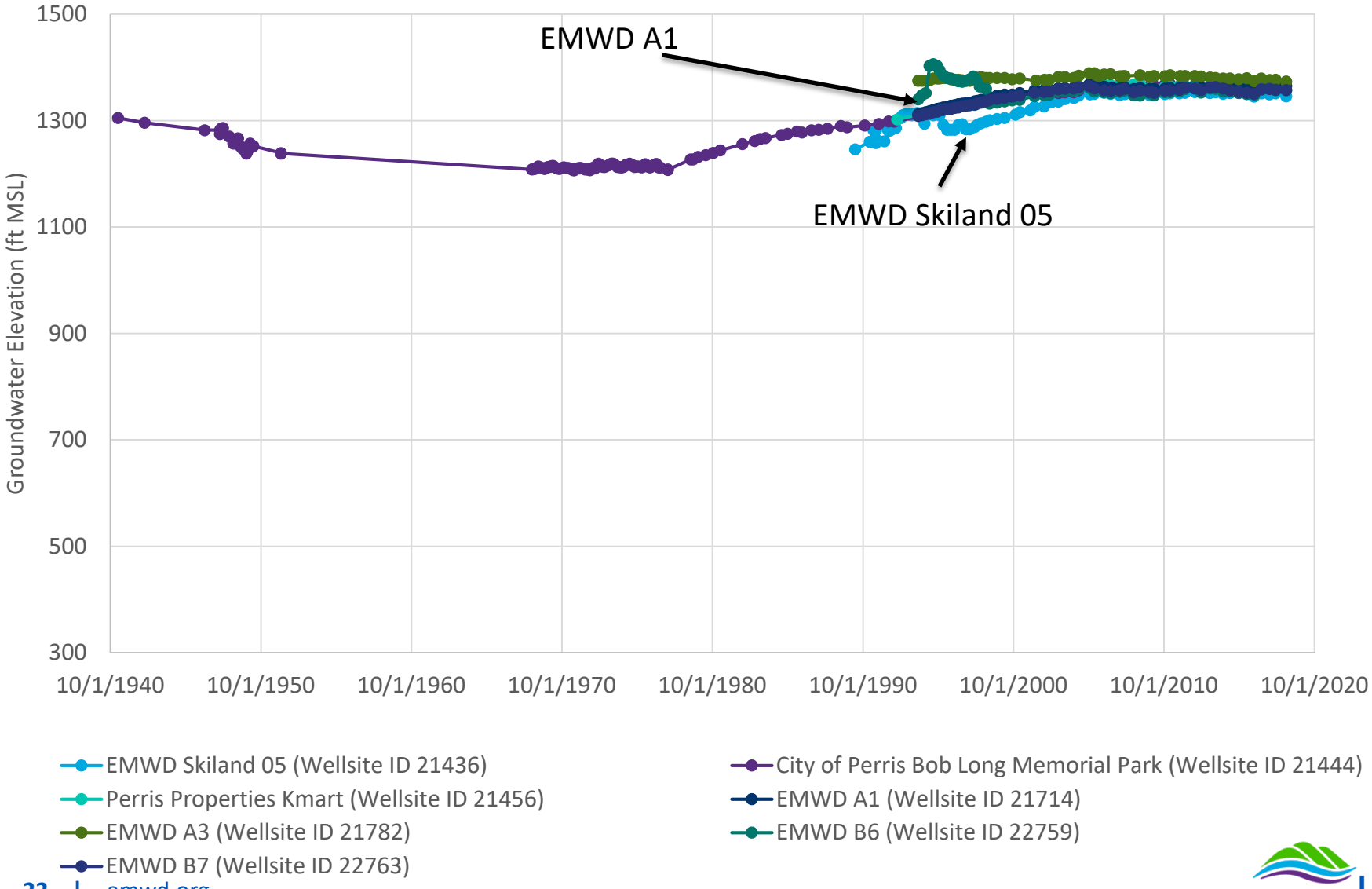
- Municipal Calendar Year Production 2019
- Future Municipal Production
- Agricultural / Private Production 2019

SOUTH PERRIS PRODUCTION AREA

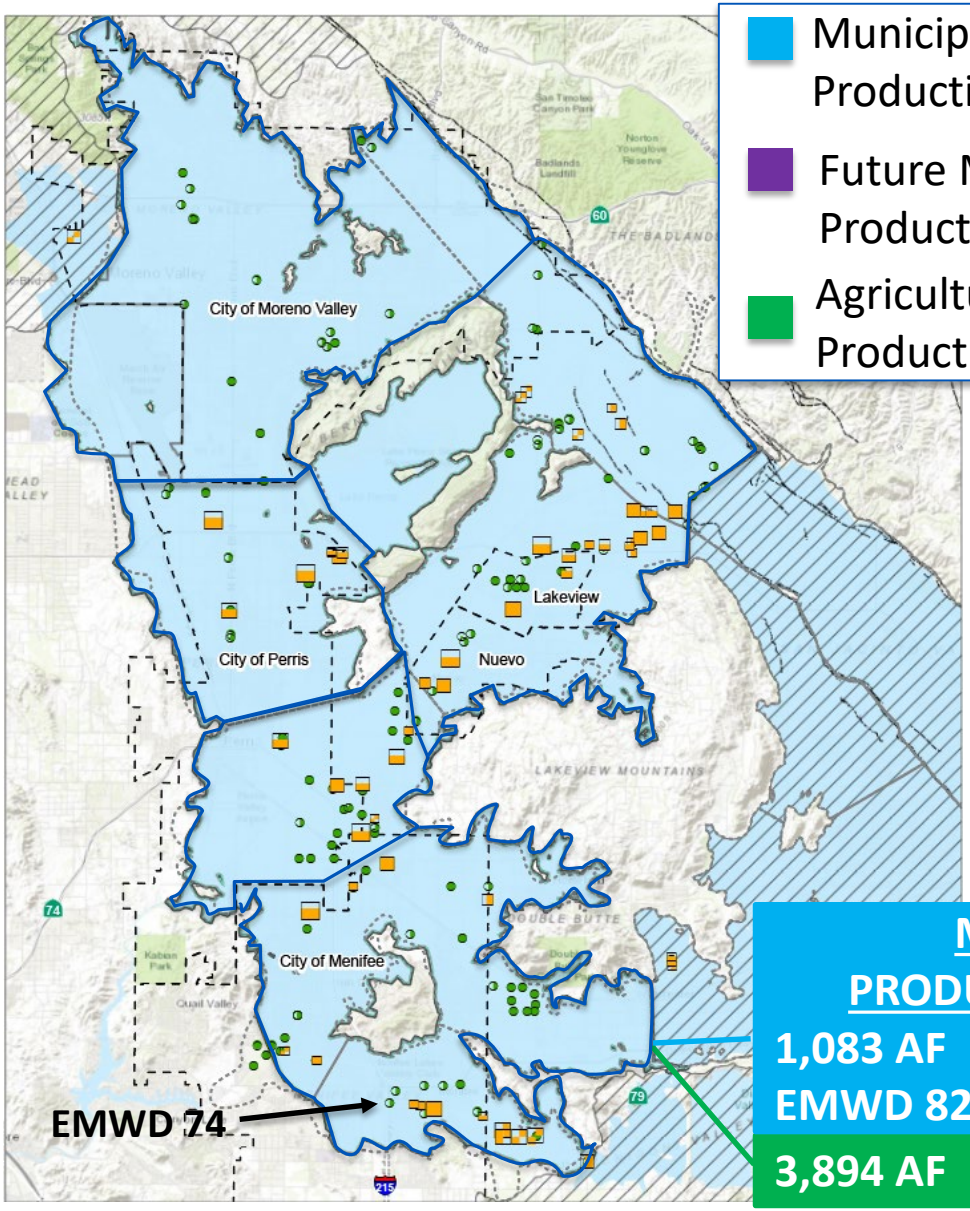
7,502 AF
Excluding 75/78

185 AF

Water Levels: South Perris Production Area



Production Areas



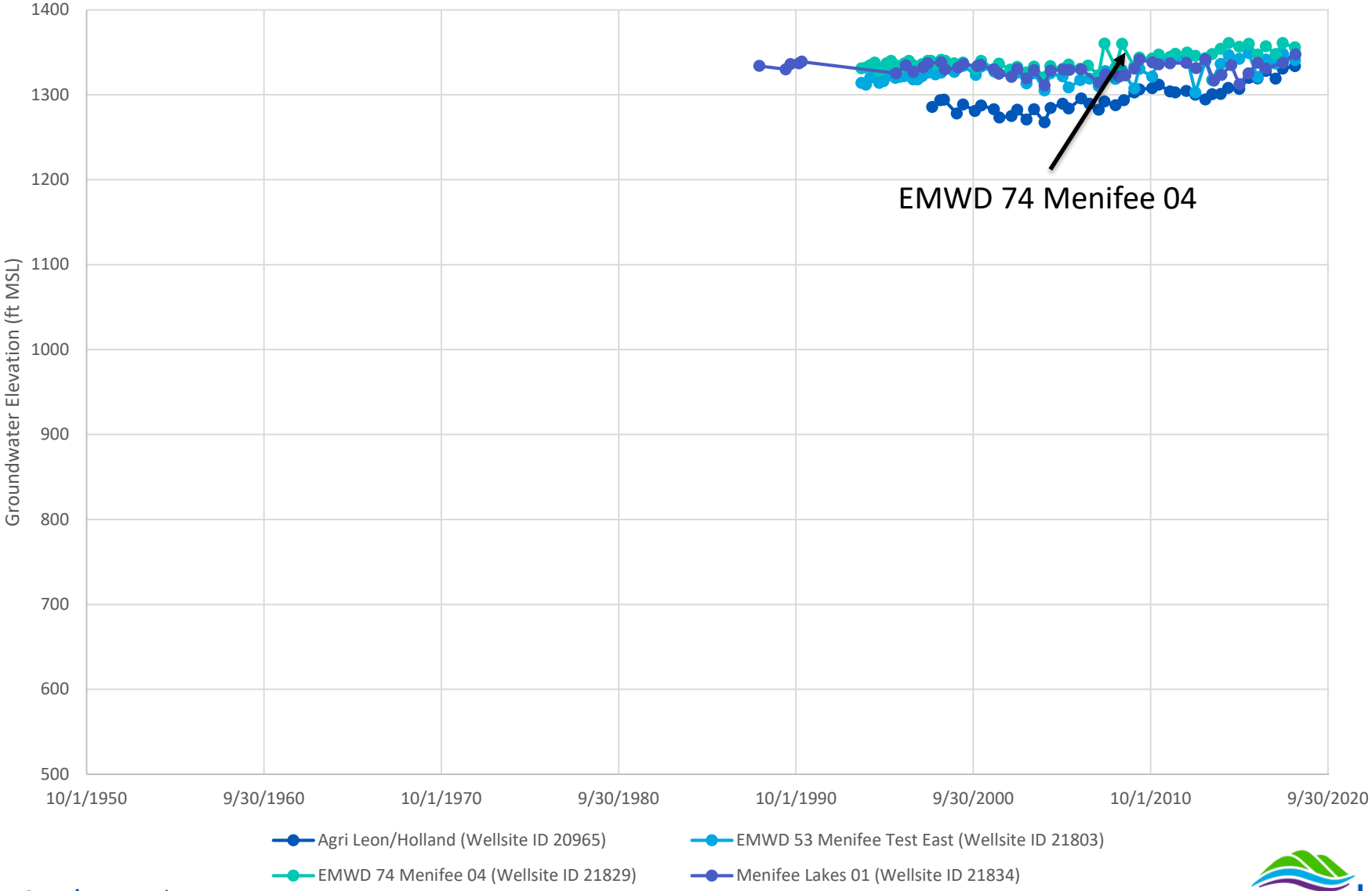
- Municipal Calendar Year Production 2019
- Future Municipal Production
- Agricultural / Private Production 2019

MENIFEE PRODUCTION AREA

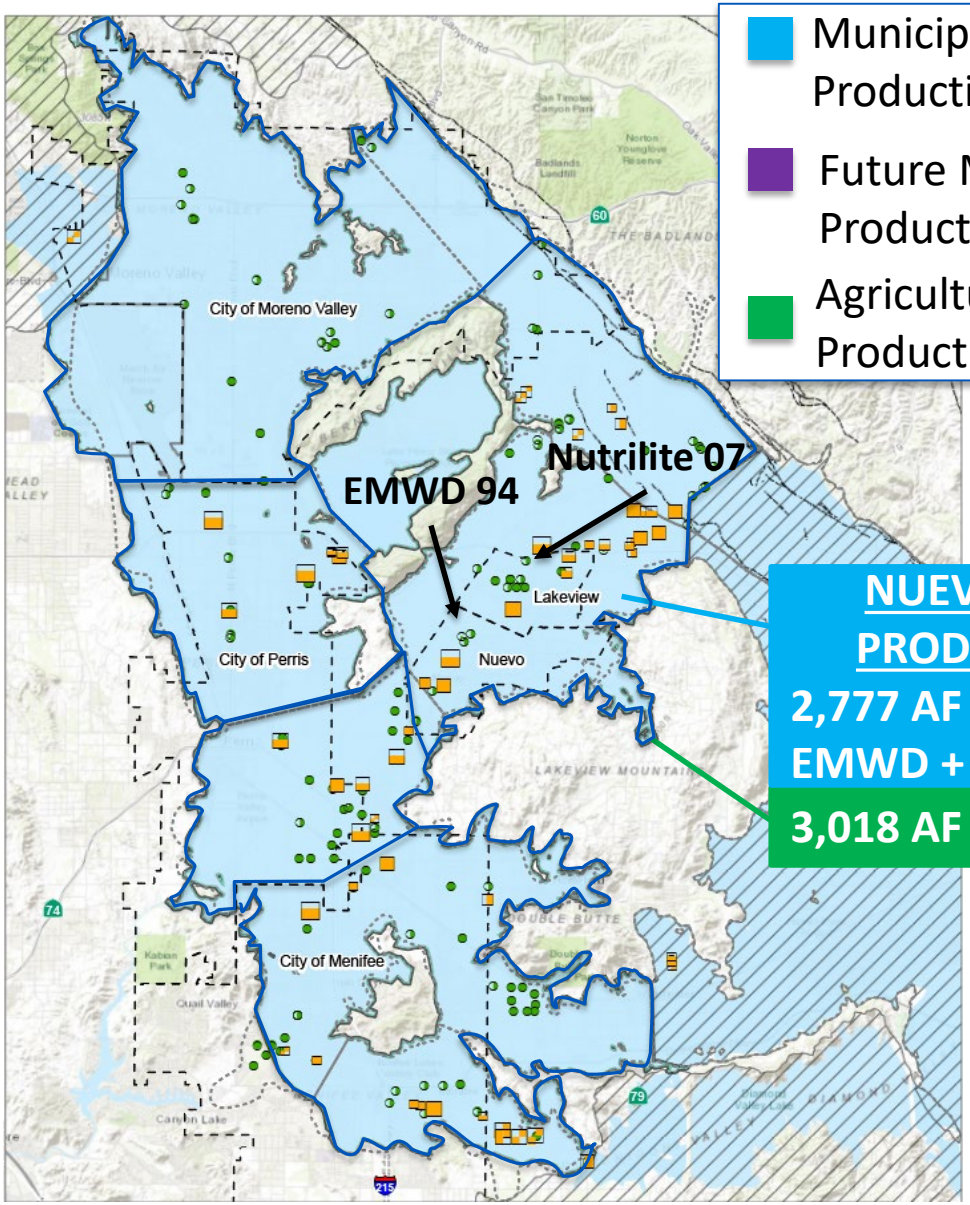
1,083 AF
EMWD 82

3,894 AF

Water Levels: Menifee Production Area



Production Areas



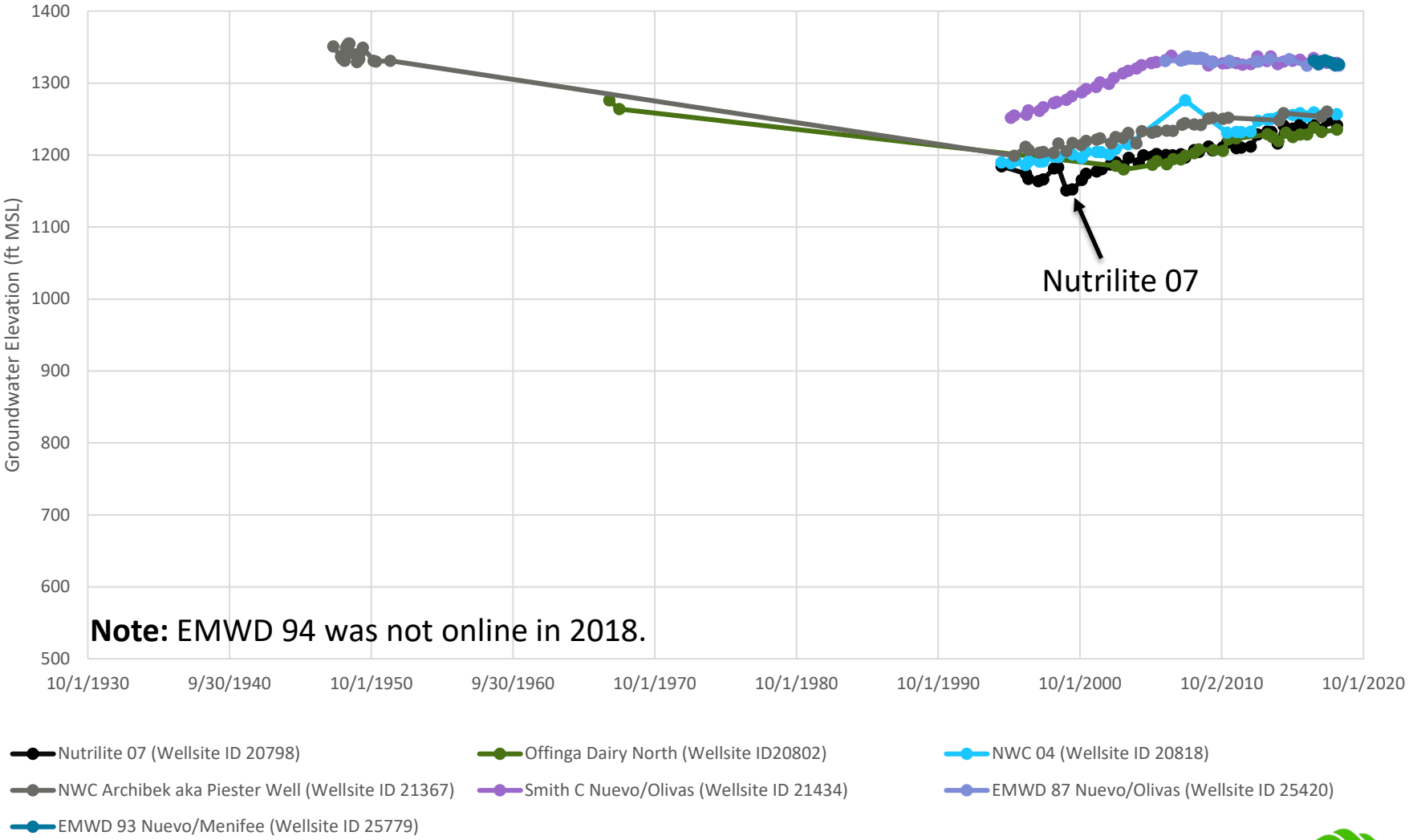
- Municipal Calendar Year Production 2019
- Future Municipal Production
- Agricultural / Private Production 2019

NUEVO/LAKEVIEW PRODUCTION AREA

2,777 AF
EMWD + NWC

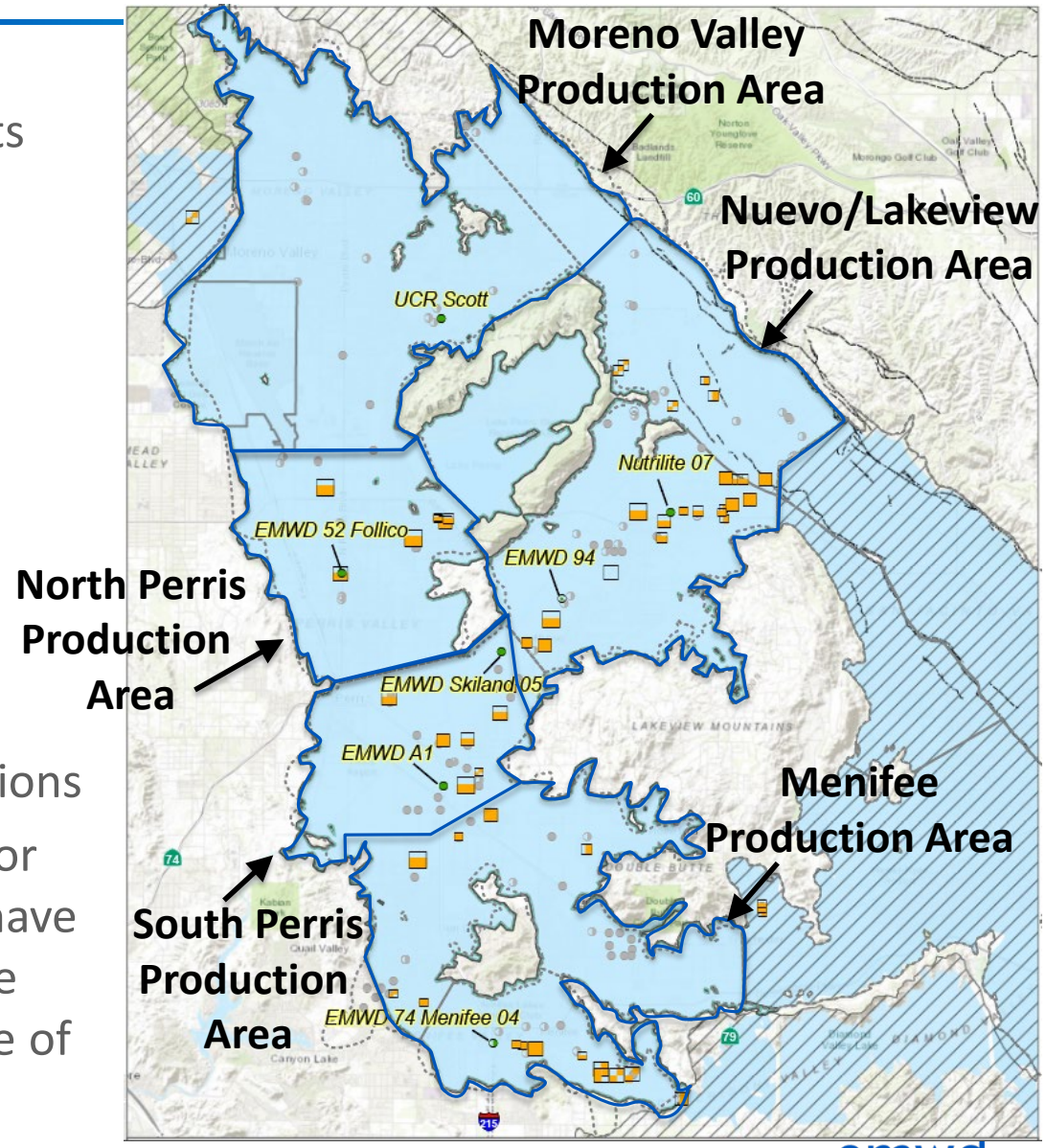
3,018 AF

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



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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*

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Undesirable Results Under SGMA

SUSTAINABILITY INDICATORS

APPLY SUSTAINABLE MANAGEMENT CRITERIA

- Review data
- Consider beneficial uses and users of groundwater
- Review specific metrics for each sustainability indicator

EMWD Next Steps

- At **any single** representative monitoring site are any minimum thresholds being exceeded?

NO → No Undesirable Results

YES ↓

- Does **any combination of minimum threshold exceedances** constitute a locally-defined significant and unreasonable effect?

NO → No Undesirable Results

YES → Undesirable Results

IS THE BASIN EXPERIENCING UNDESIRABLE RESULTS?

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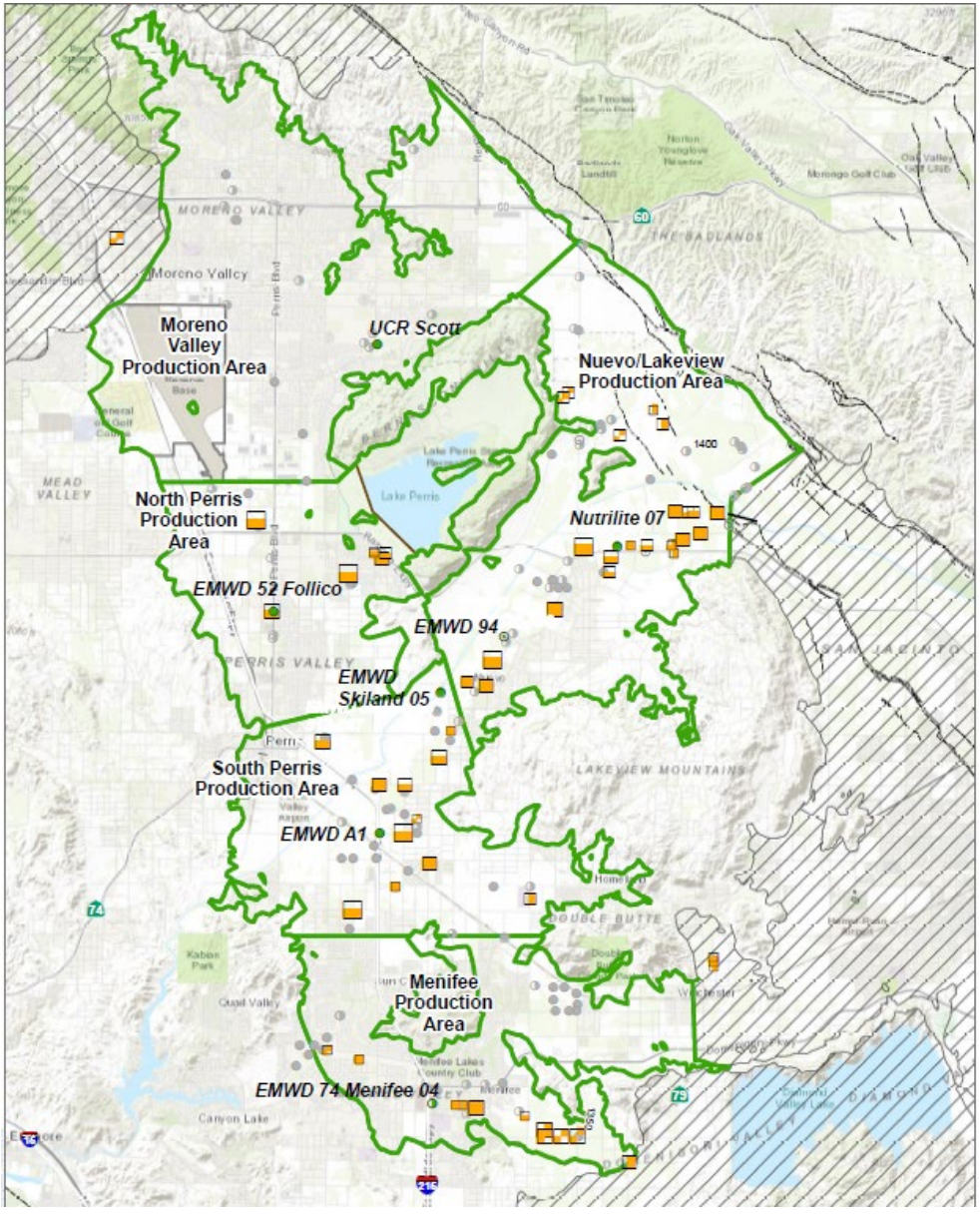
Representative Monitoring Wells in the Plan Area

- 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

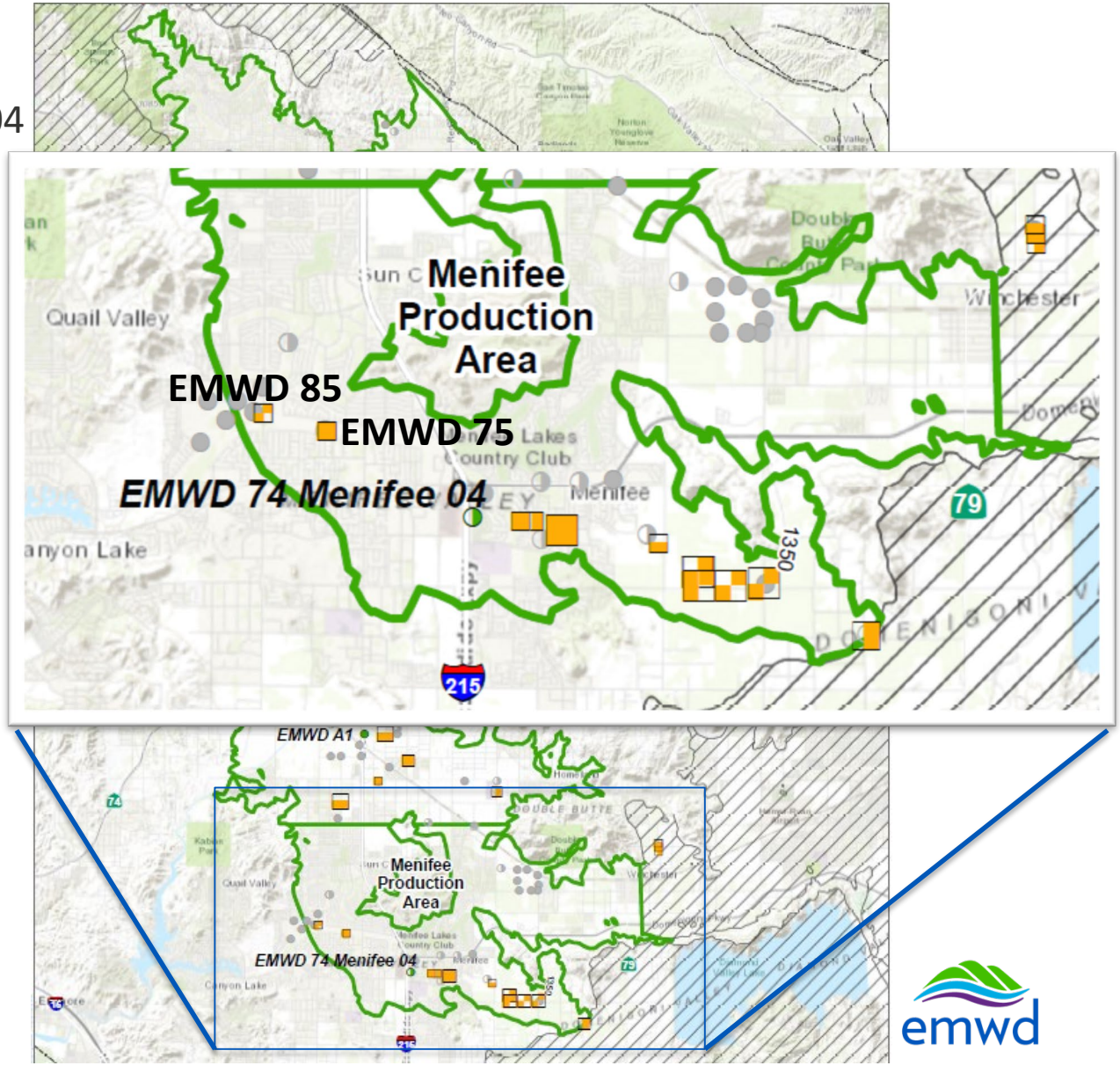


Evaluation Criteria for Proposed MTs

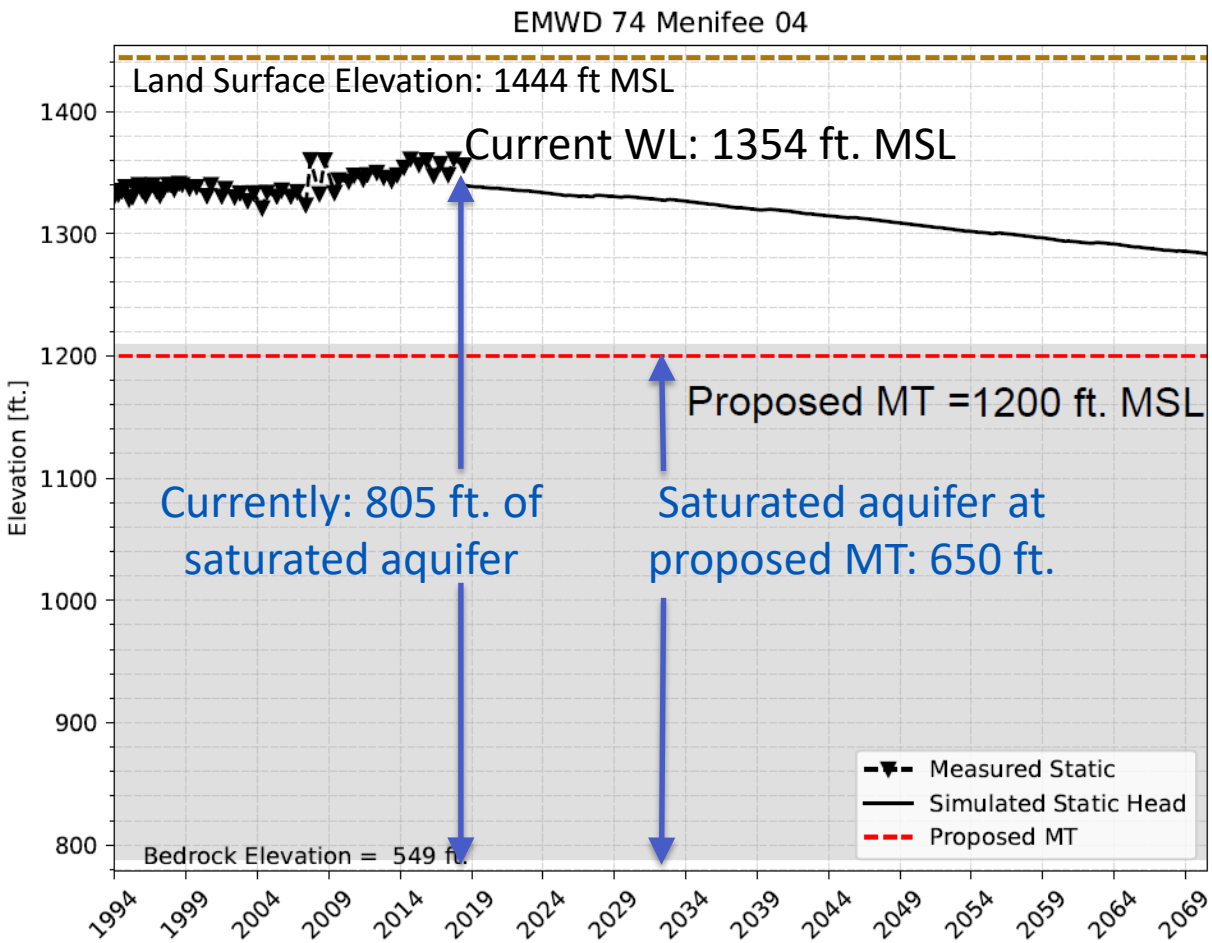
- Hydrogeologic considerations:
  - Trends in historical groundwater elevations
  - Local saturated thickness of the aquifer
  - Basin-wide saturated thickness of the aquifer
- EMWD and Stakeholder Operational Considerations:
  - Static groundwater elevations relative to screen intervals at nearby production 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



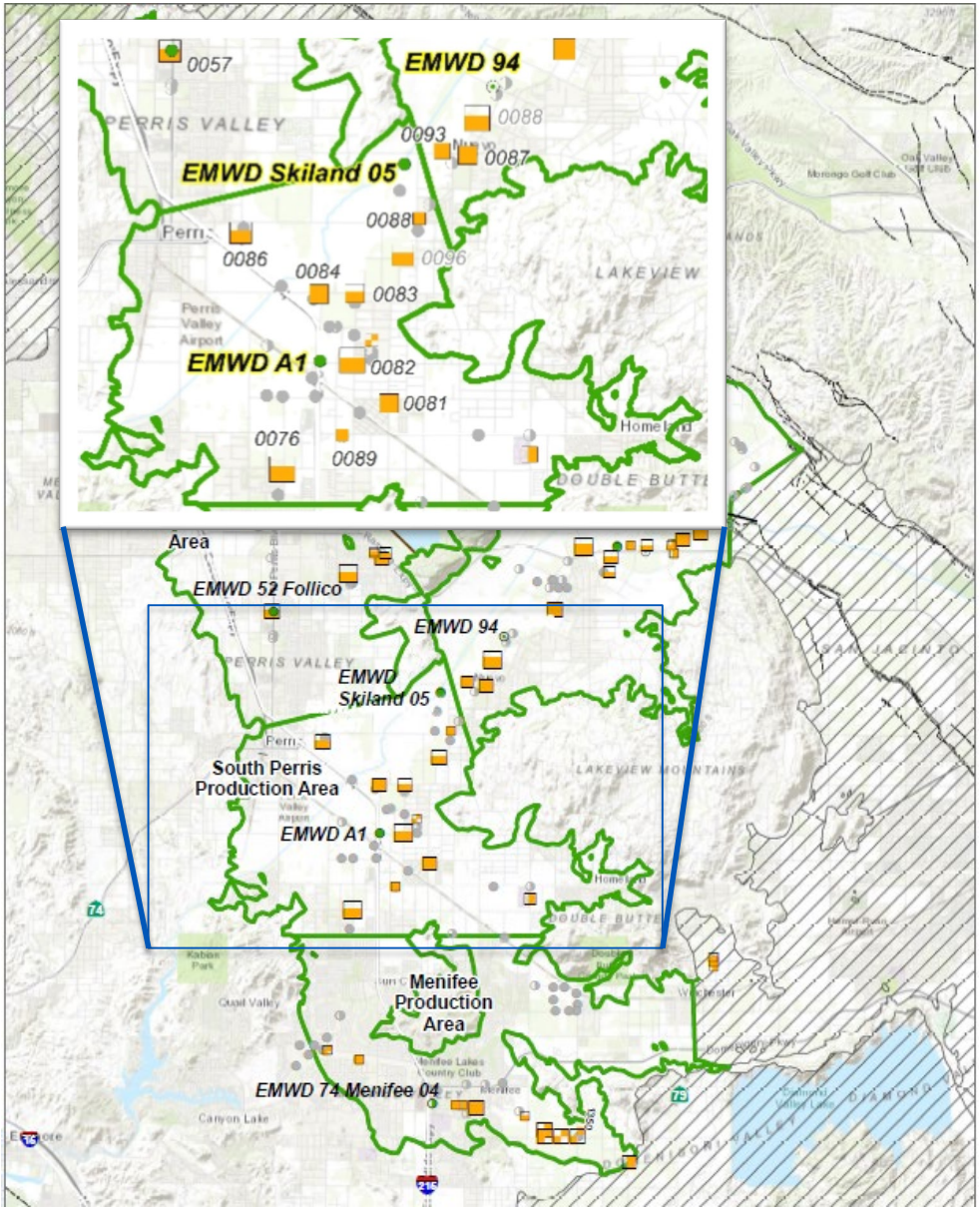
Proposed MT at EMWD 74



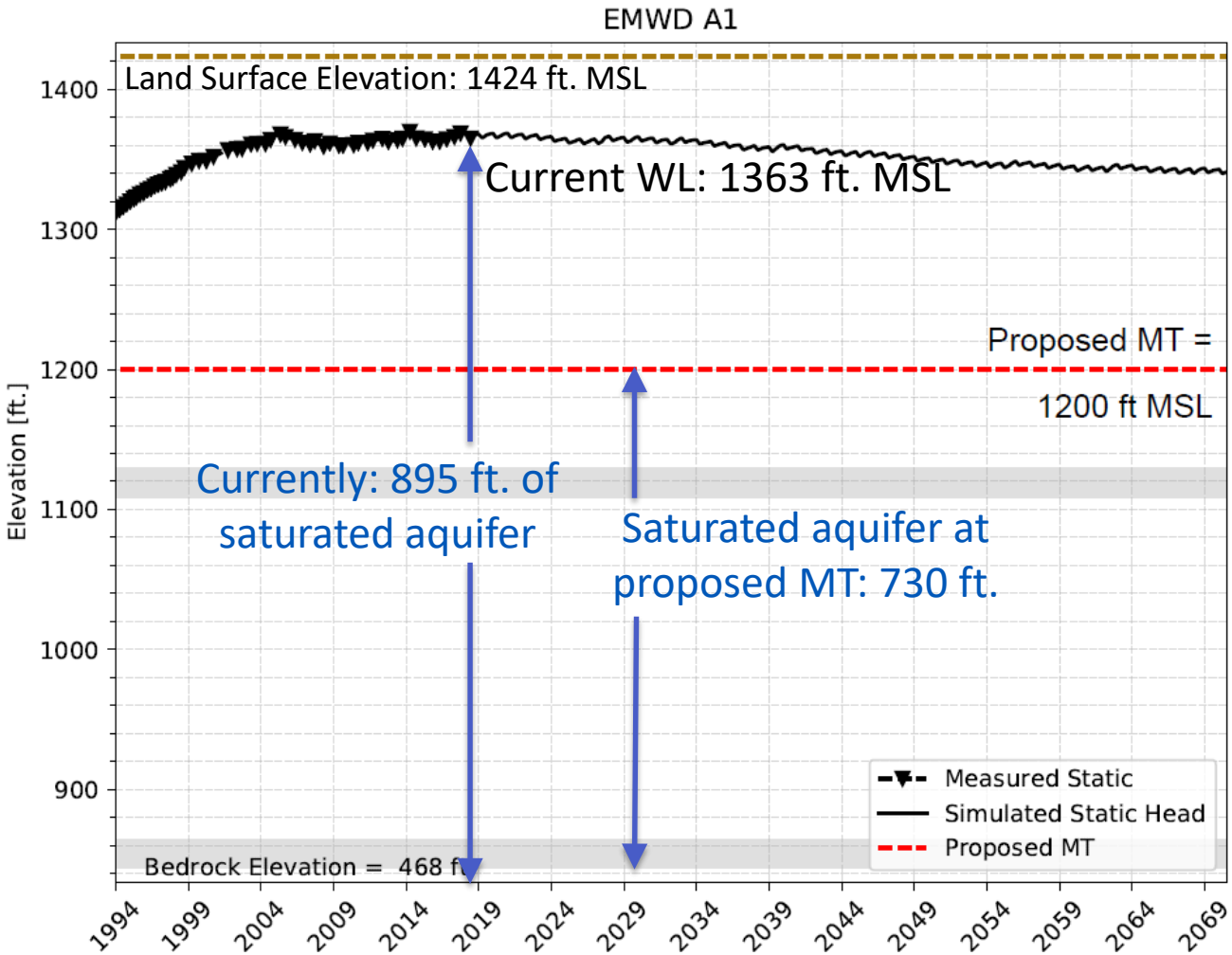
- Proposed minimum threshold = 1200 ft. MSL.
- Protects EMWD operational flexibility
- Limits long-term decline in groundwater elevation and storage
- Maintains average aquifer saturation > 60% in the Menifee Production Area

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

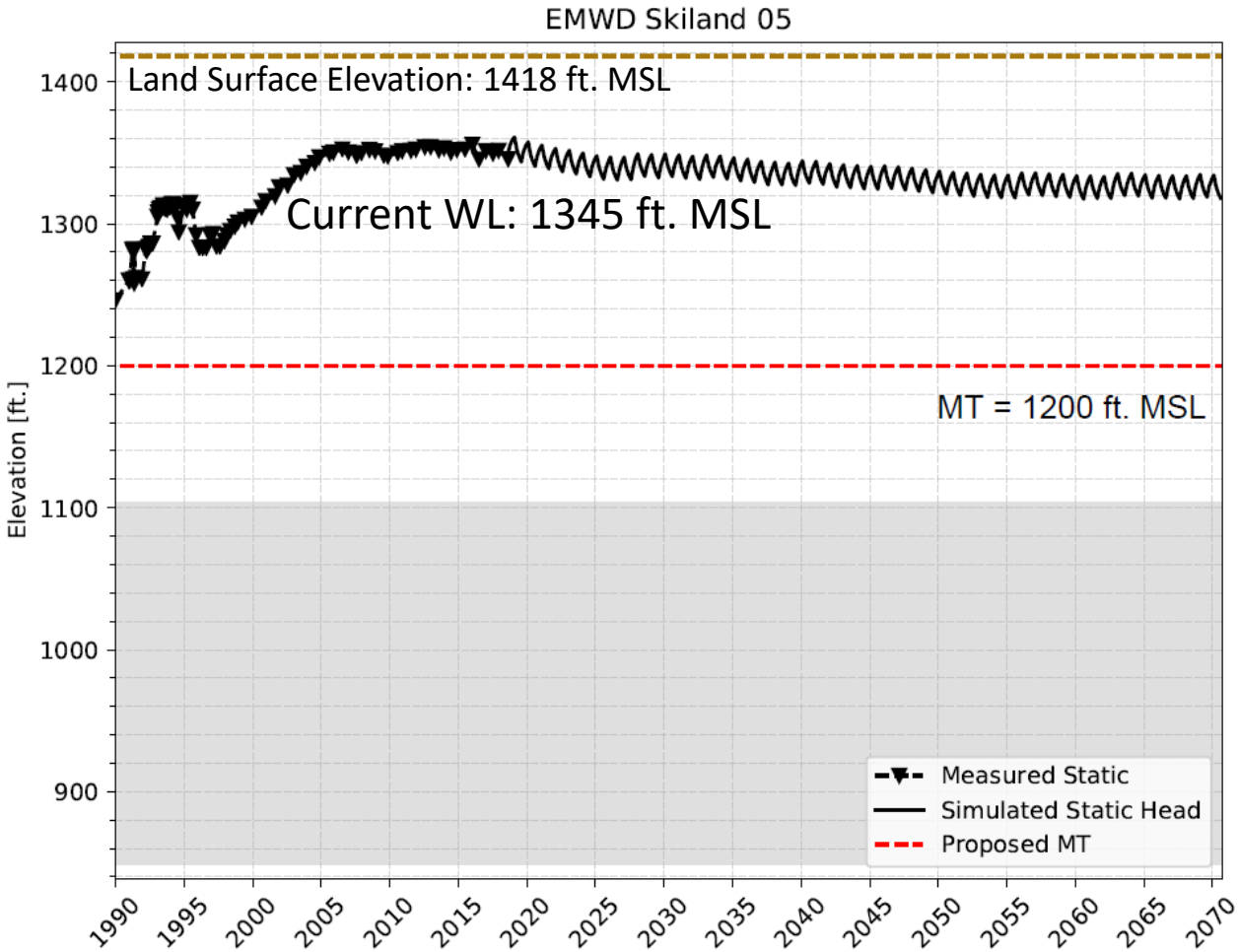


Proposed MT at EMWD A1



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

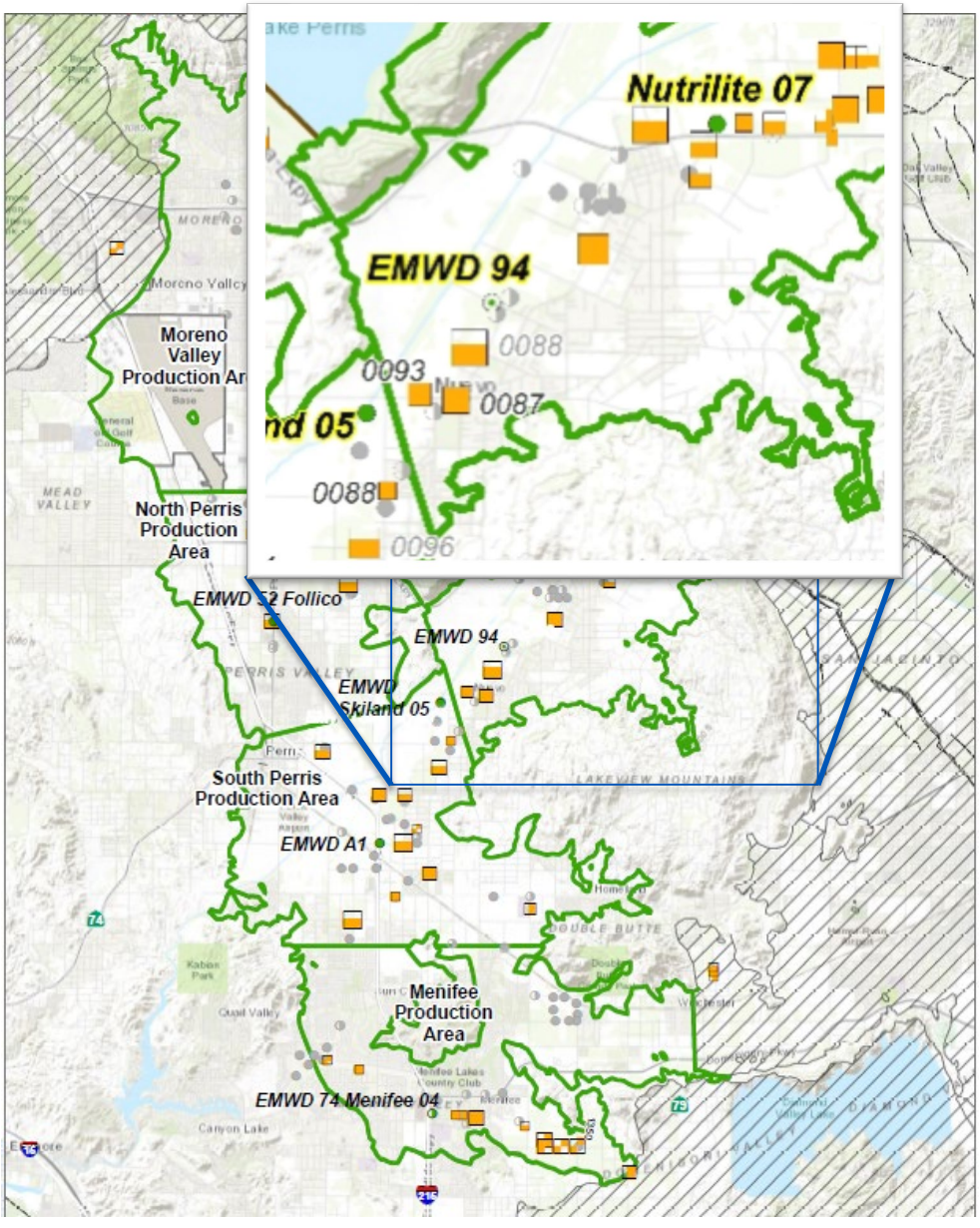
Representative Monitoring Well Skiland 05



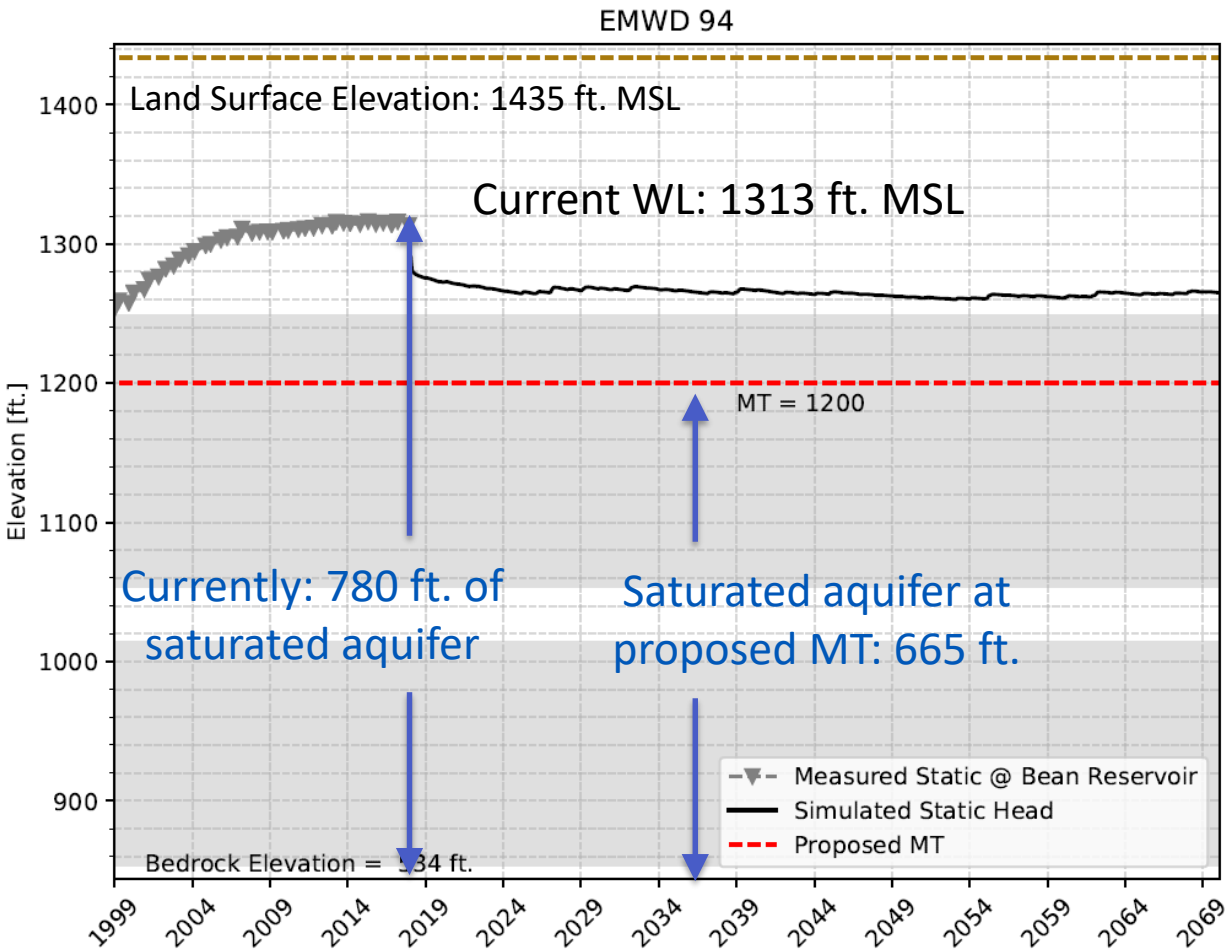
- Proposed minimum threshold = 1200 ft. MSL.
- Protects EMWD operational flexibility
- Limits long-term decline in groundwater elevation and storage
- Maintains average aquifer saturation > 70% in the South Perris Production Area

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

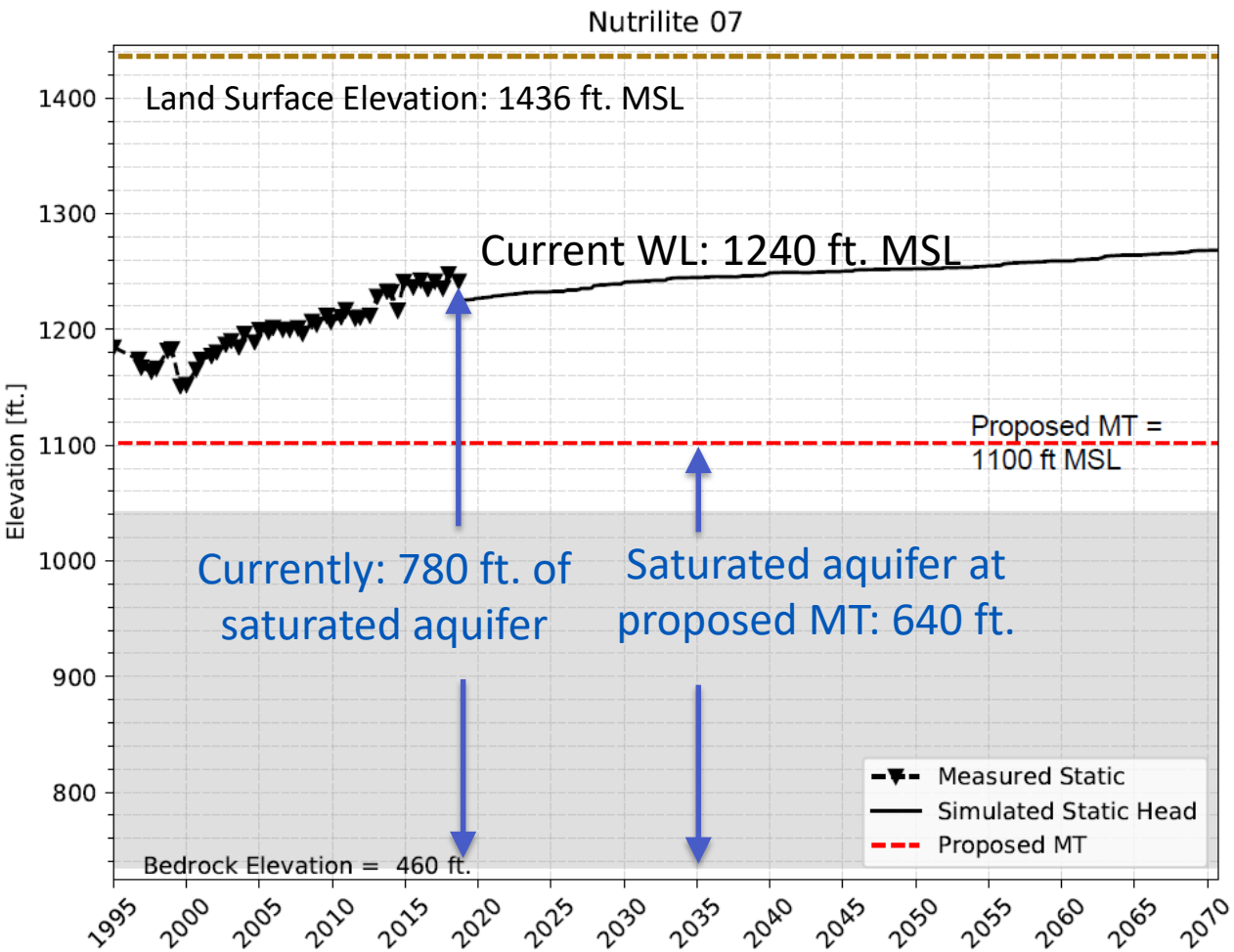


Representative Well EMWD 94



- 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

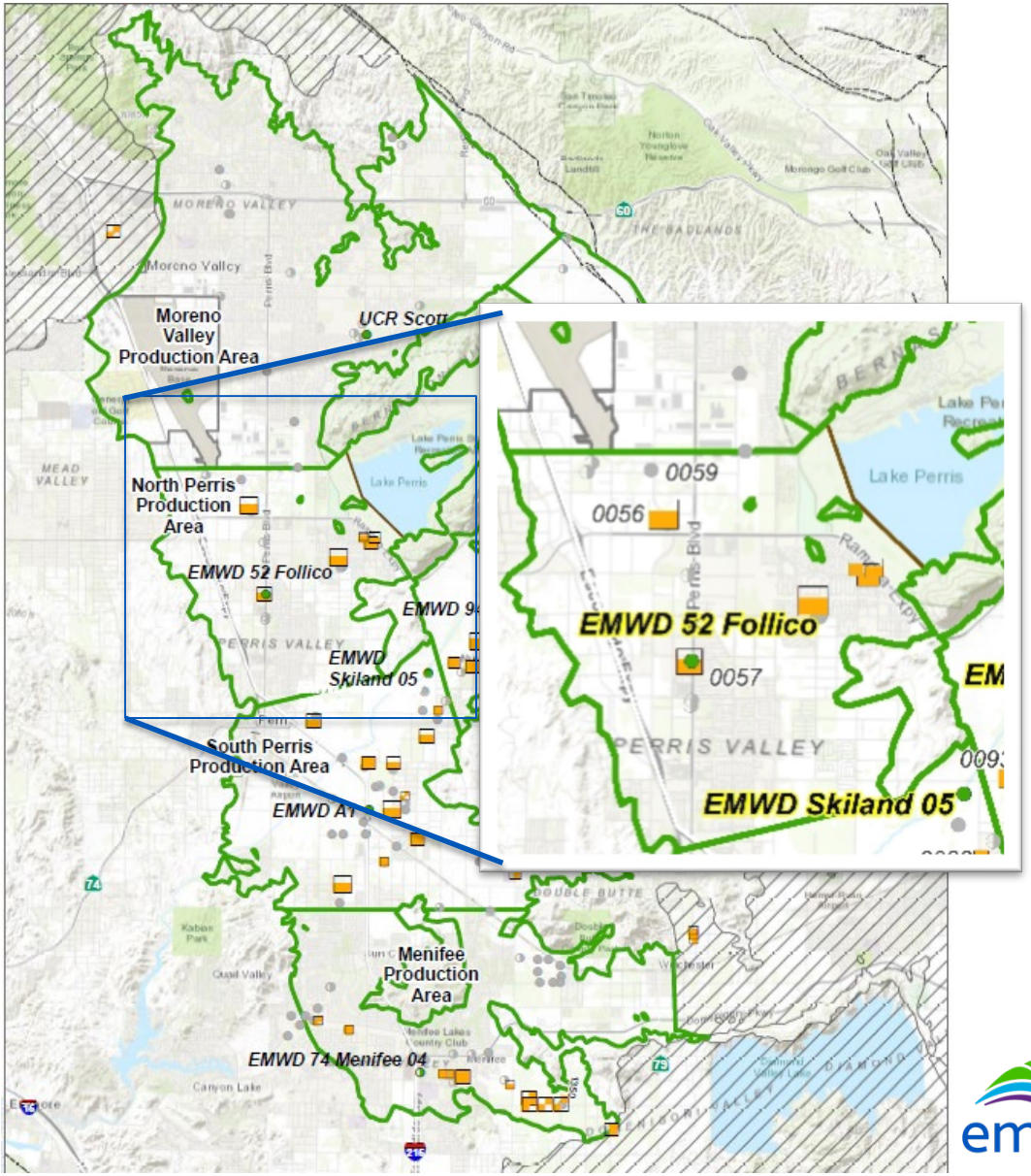
Representative Monitoring Well Nutrilite 07



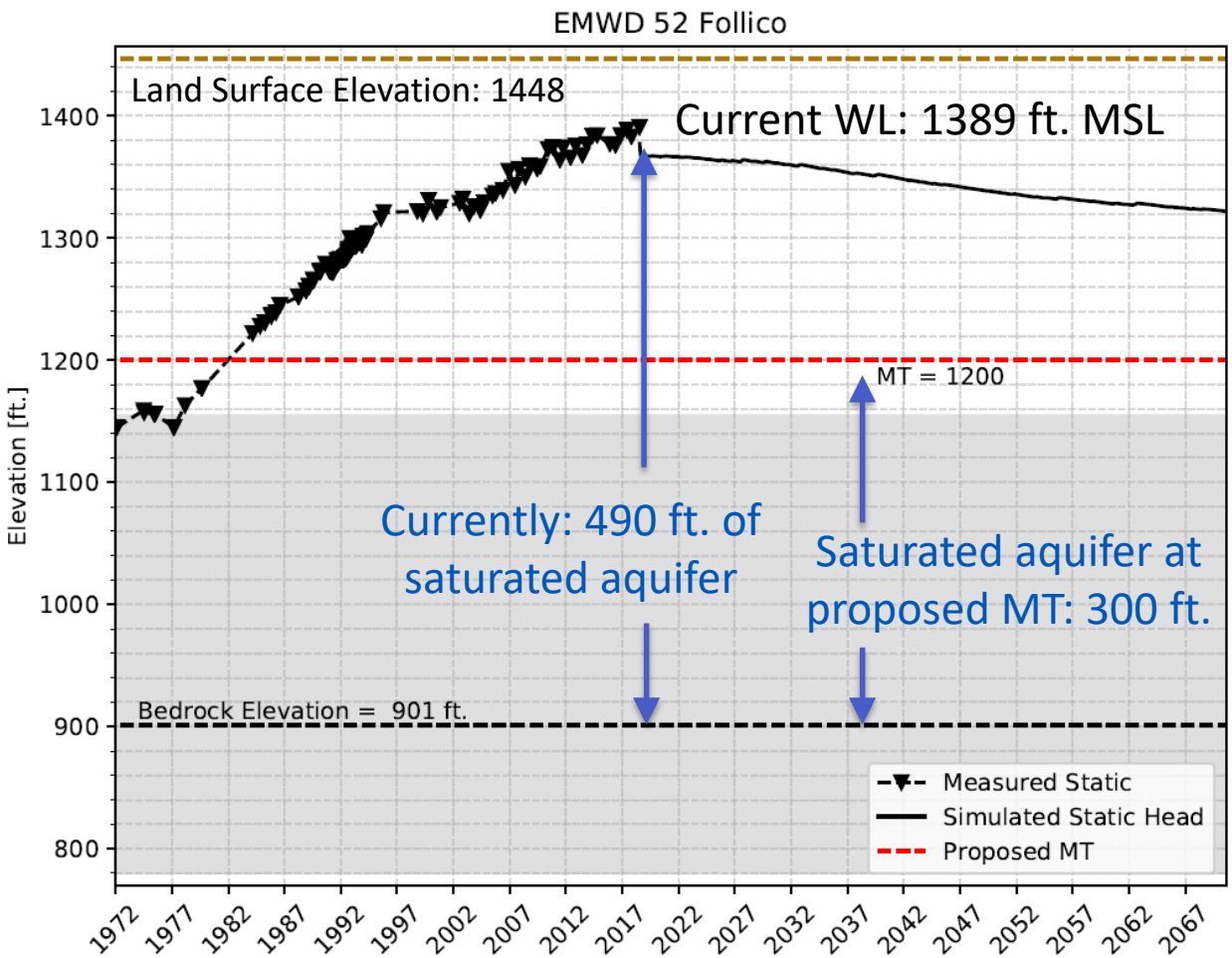
- Nutrilite 07 is a monitoring well
- Future groundwater elevations not well characterized
- Historical water levels have been as low as 1150 ft MSL
- Proposed MT = 1100 ft MSL
  - 140 feet lower than current WL
- >70% aquifer saturation

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



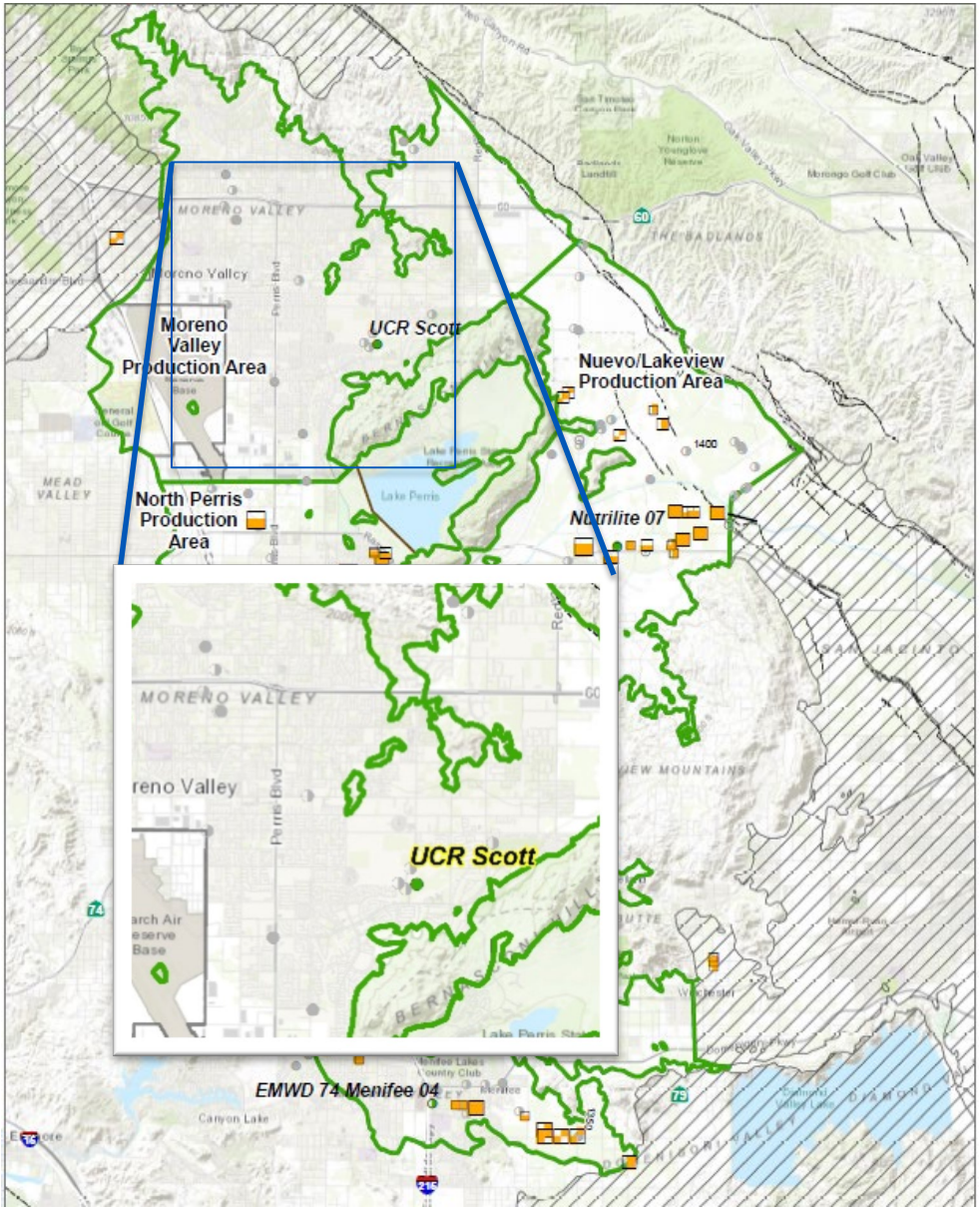
Representative Monitoring Well EMWD 52



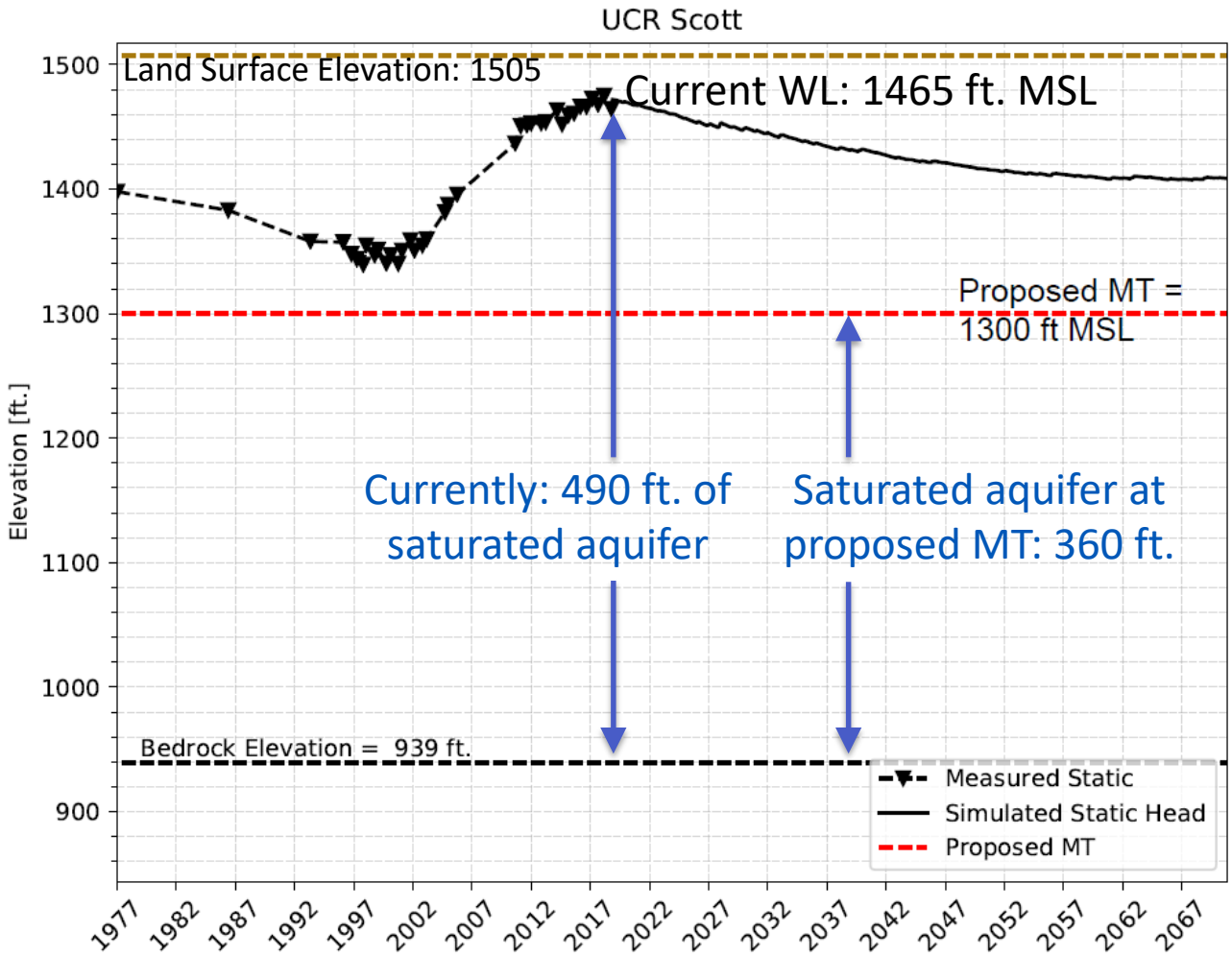
- EMWD 52 is a monitoring well
- Future WLs anticipated to decline
- Proposed Minimum Threshold – 1200 ft. MSL
- Preserves >60% aquifer saturation in North Perris Production Area

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

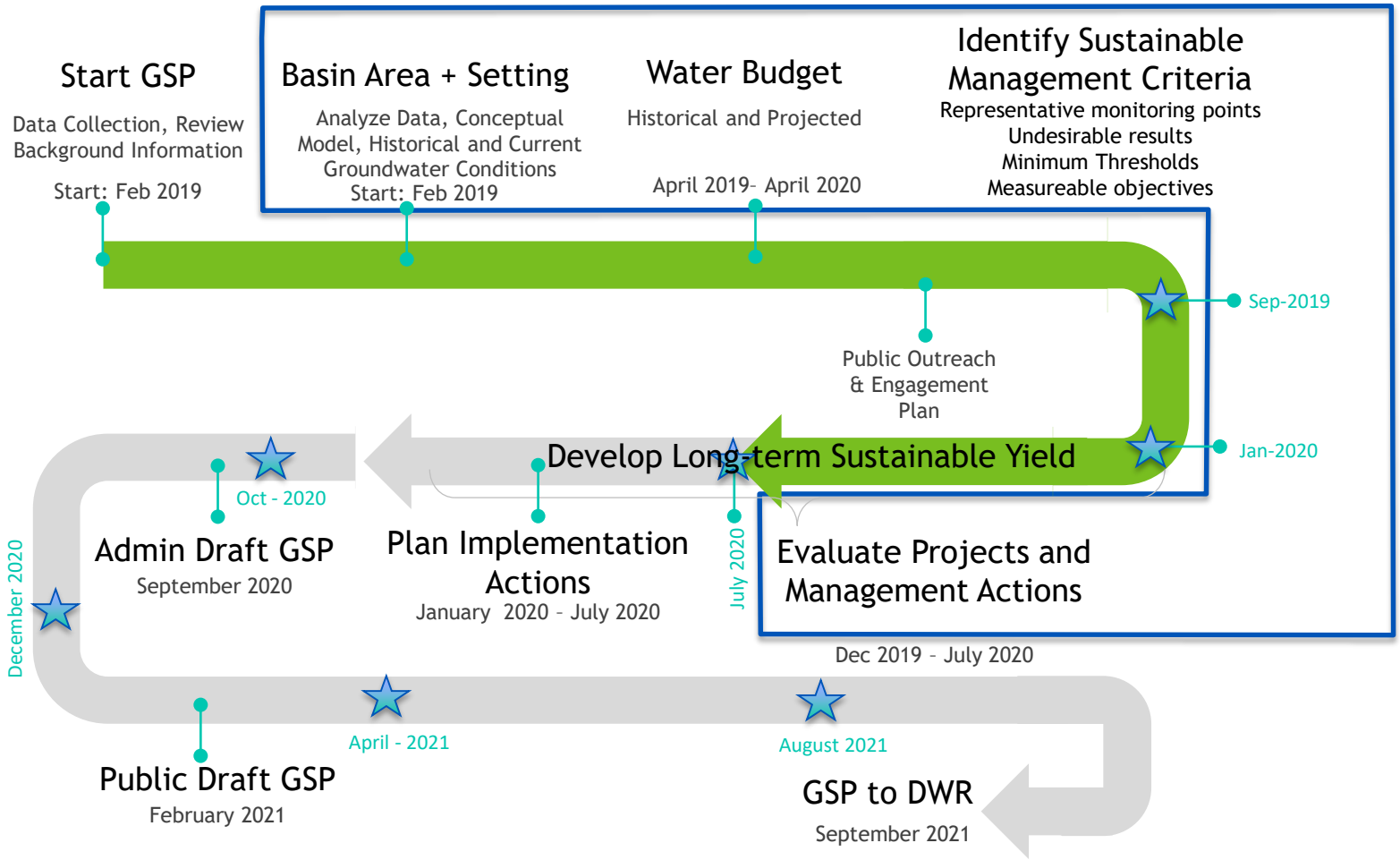
RMP	Proposed MT (ft MSL)	Operational Flexibility (ft)	Aquifer Saturation % at Proposed MT	MT At or Above Historical Low WL?
EMWD 74	1200	154	>60%	NO
EMWD A1	1200	163	>70%	NO
EMWD Skiland 05	1200	145	>70%	NO
EMWD 94	1200	113	>70%	NO
Nutrilite 07	1100	140	>70%	NO
EMWD 52	1200	190	>60%	YES
UCR Scott	1300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

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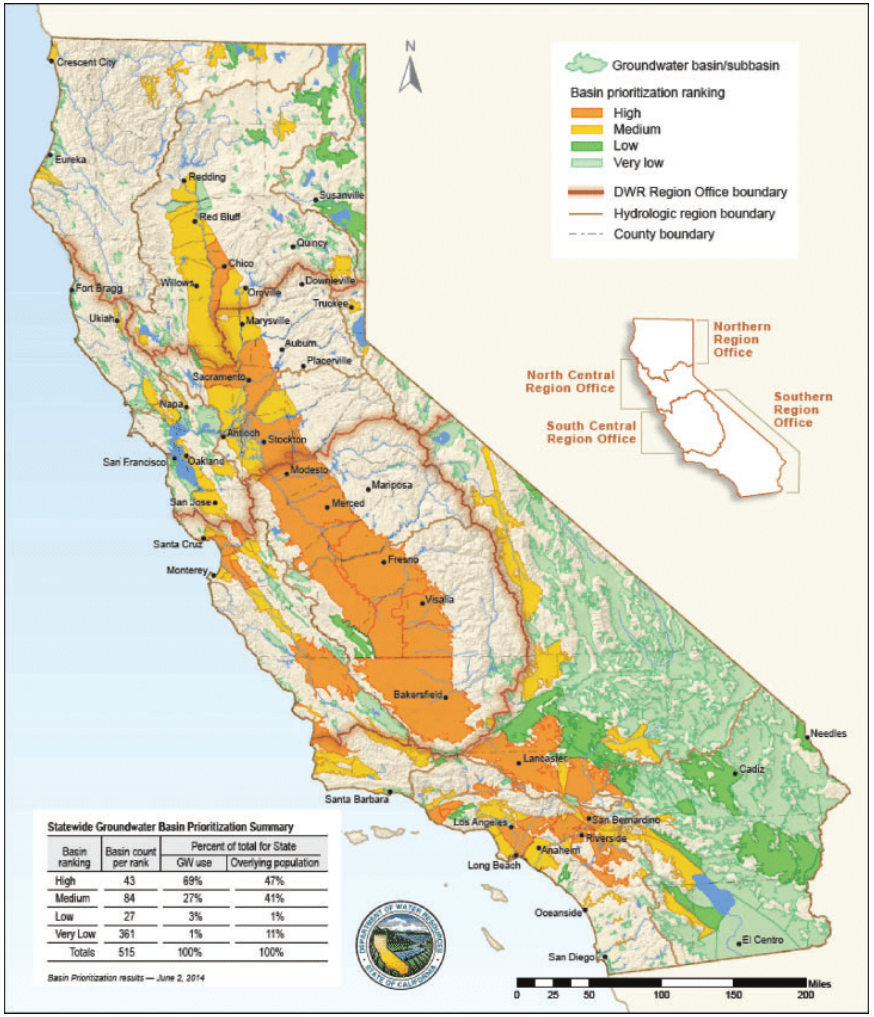
Project Overview

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.

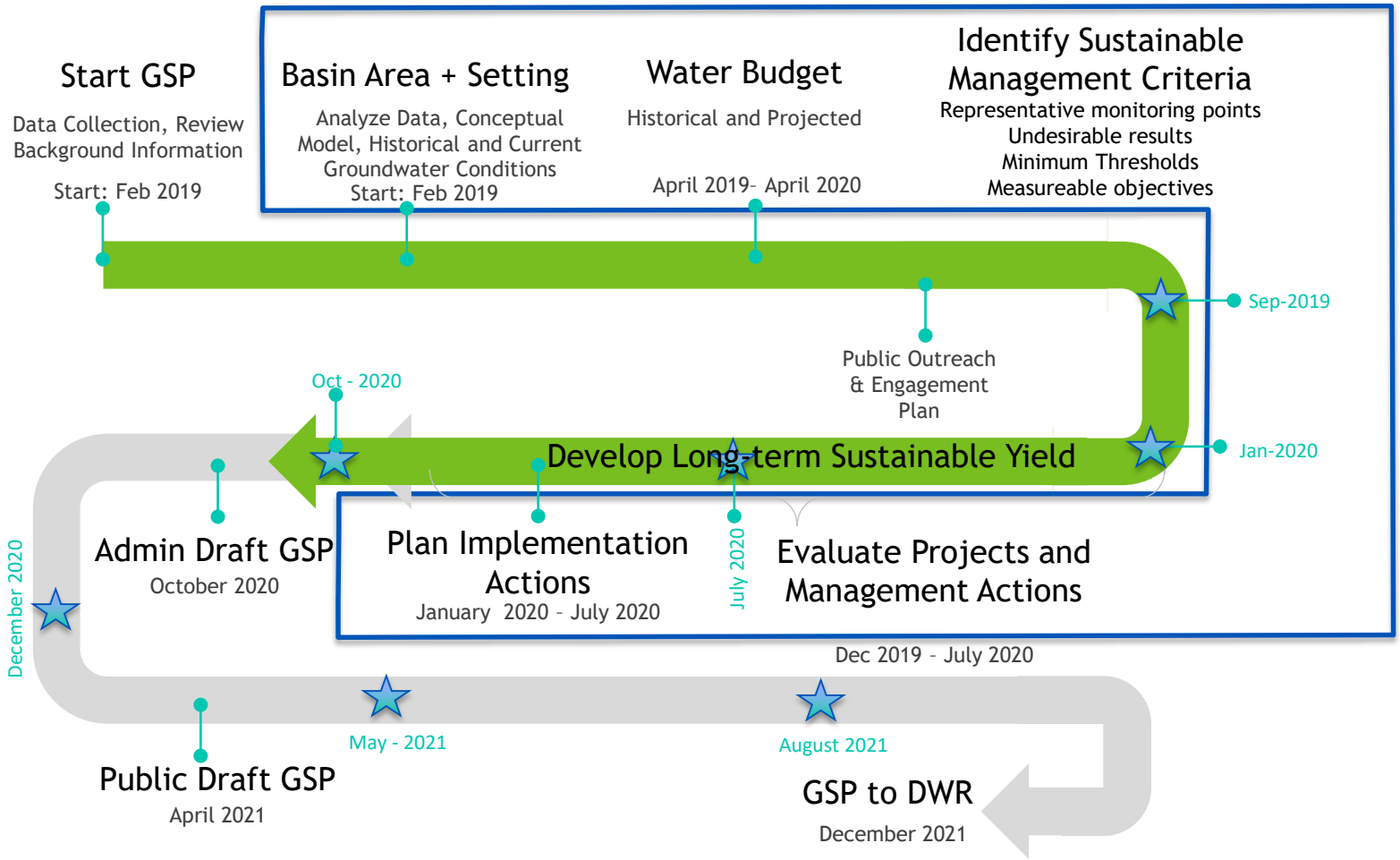


Statewide Groundwater Basin Prioritization Summary

Basin ranking	Basin count per rank	Percent of total for State	
		GW use	Overlying population
High	43	69%	47%
Medium	84	27%	41%
Low	27	3%	1%
Very Low	361	1%	11%
Totals	515	100%	100%

Basin Prioritization results — June 2, 2014

GSP Development Process



San Jacinto Groundwater Basin

Water Budgets for GSP Development

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

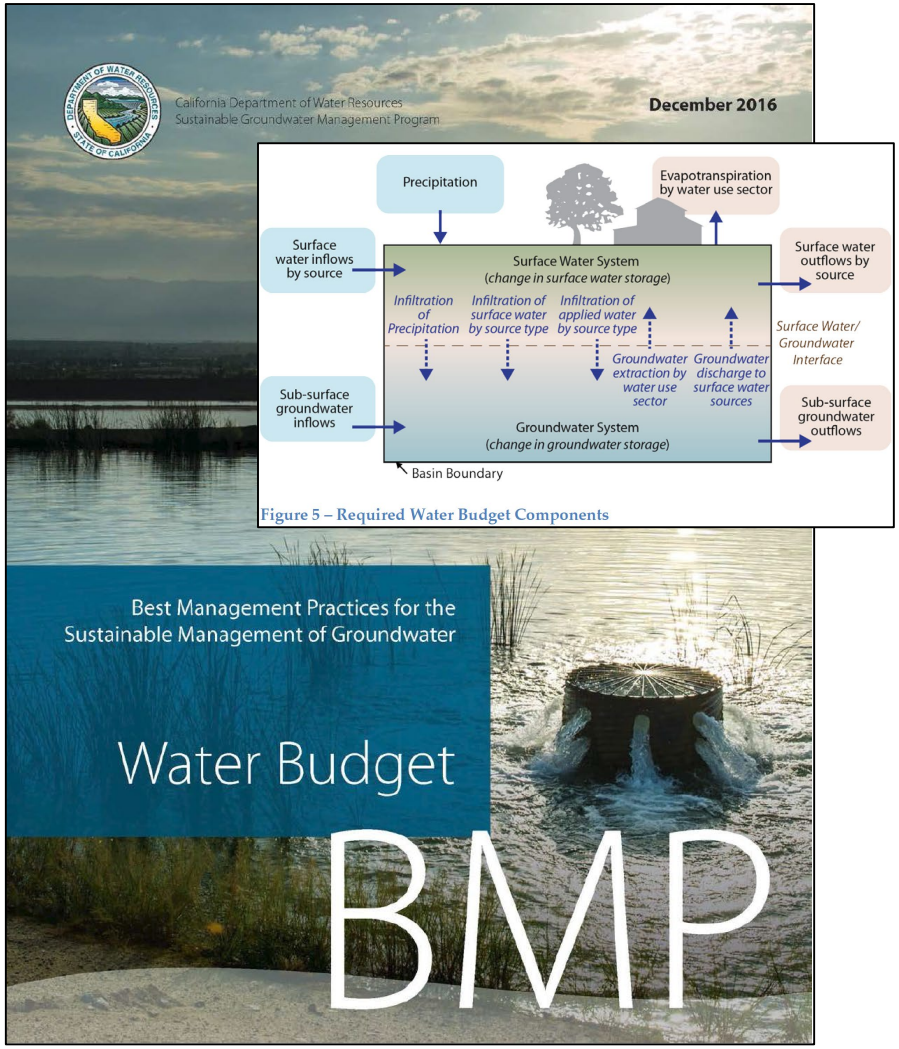
Agenda

- 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

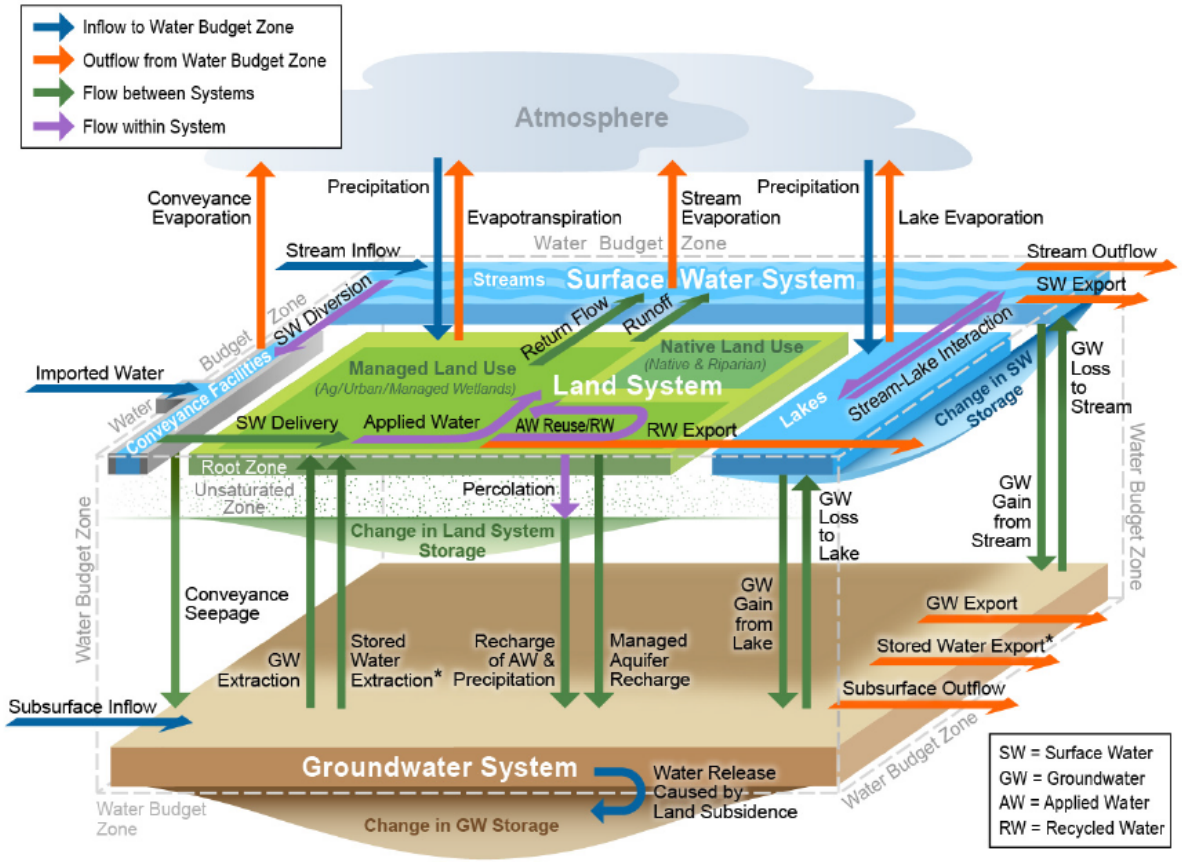


DWR's Water Budget Handbook

- 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.

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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

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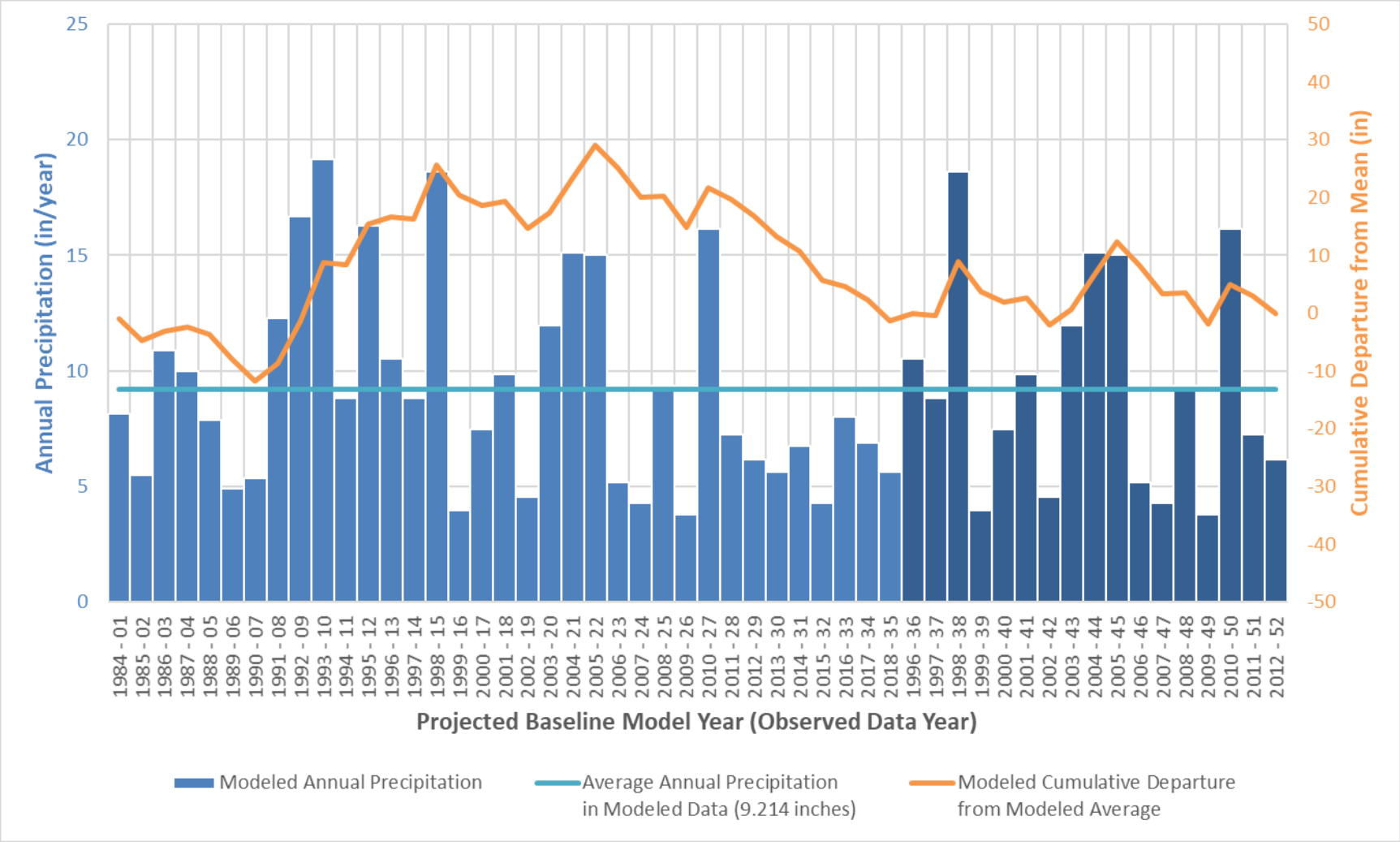
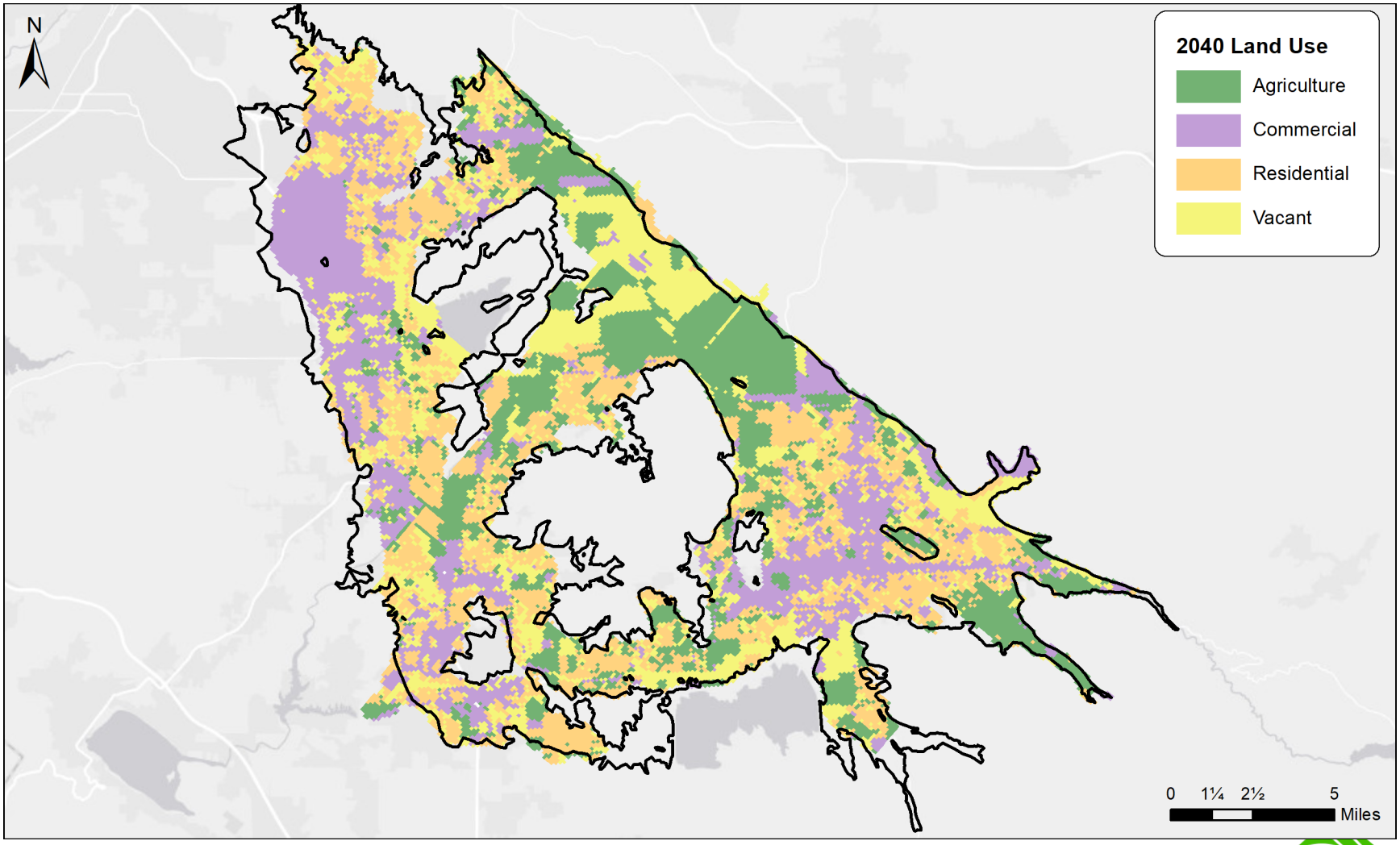
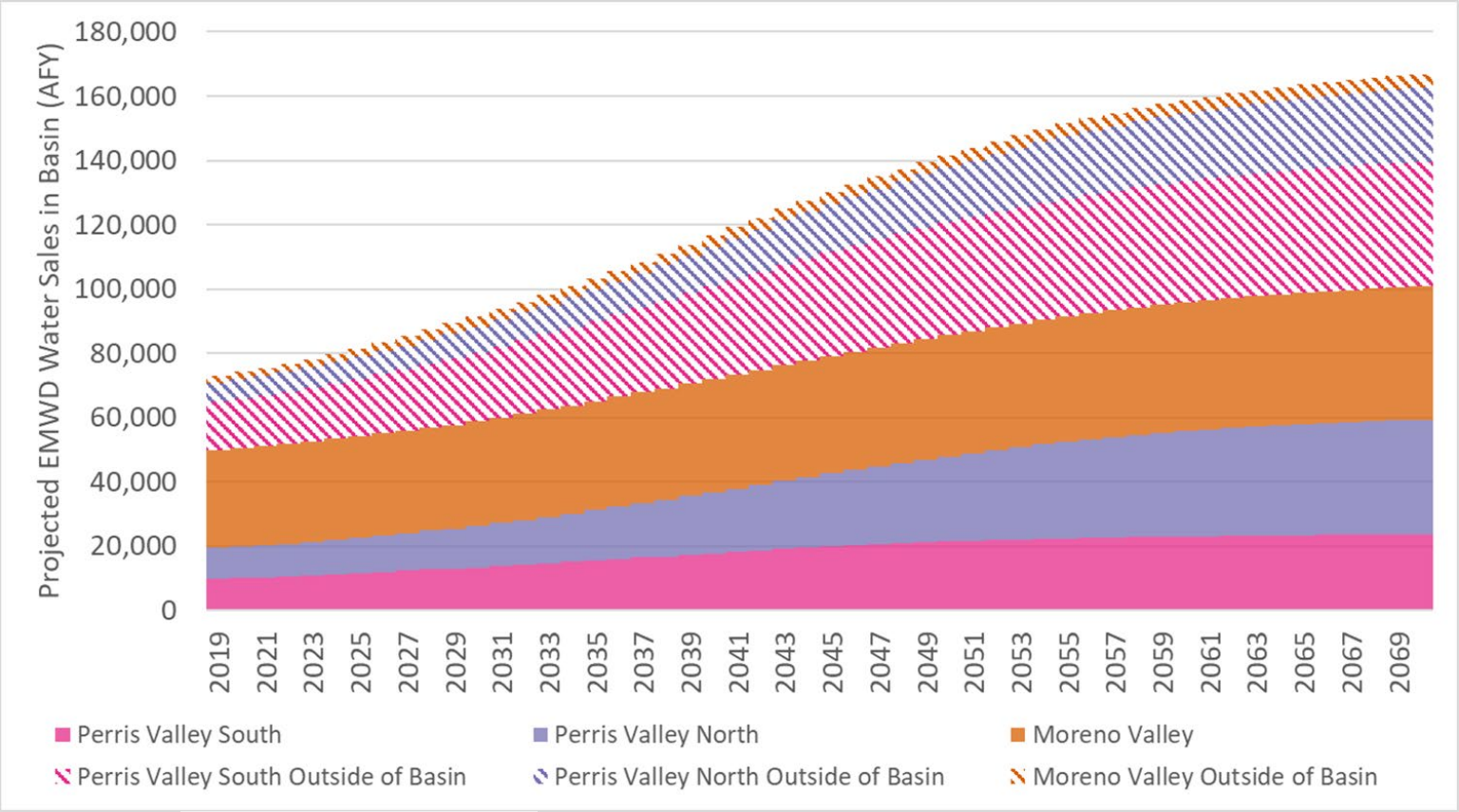
Precipitation Conditions

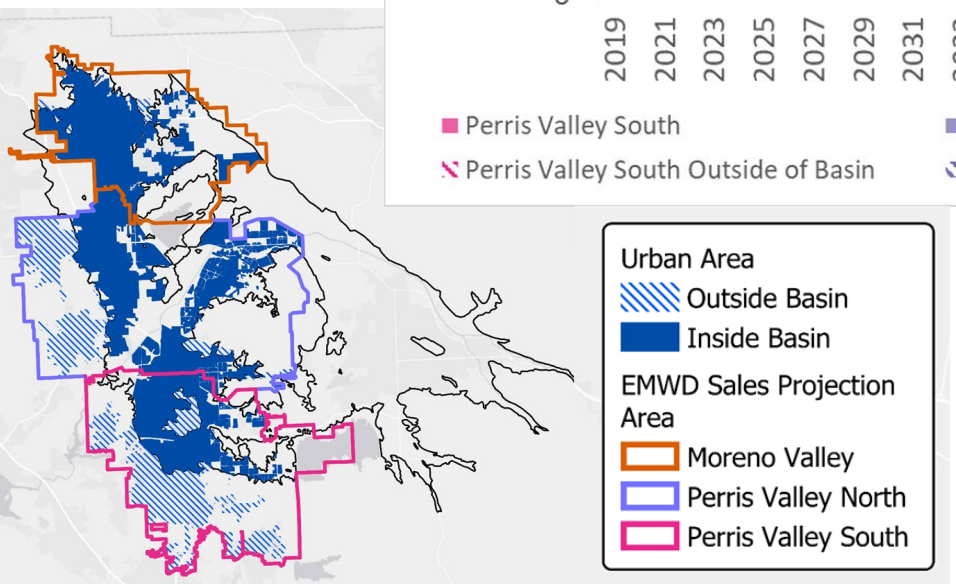


Land Use Conditions



EMWD Water Sales Deliveries





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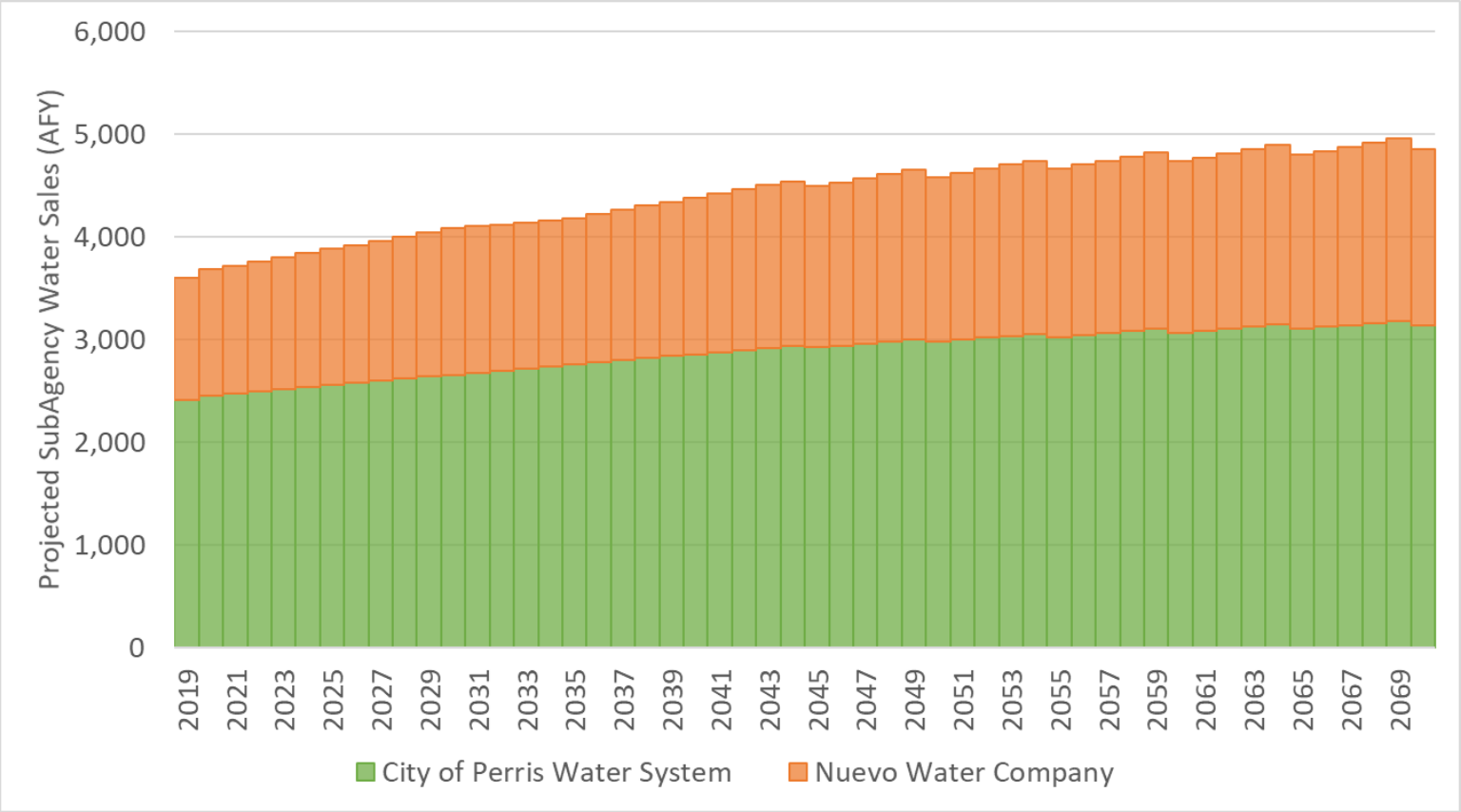
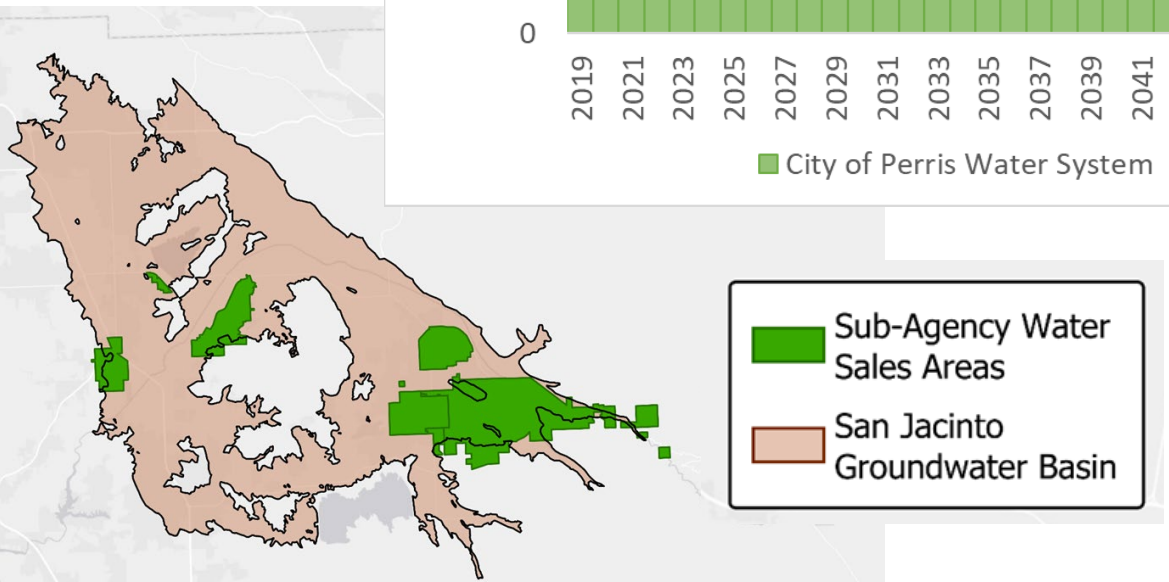
Sub-Agency Water Sales





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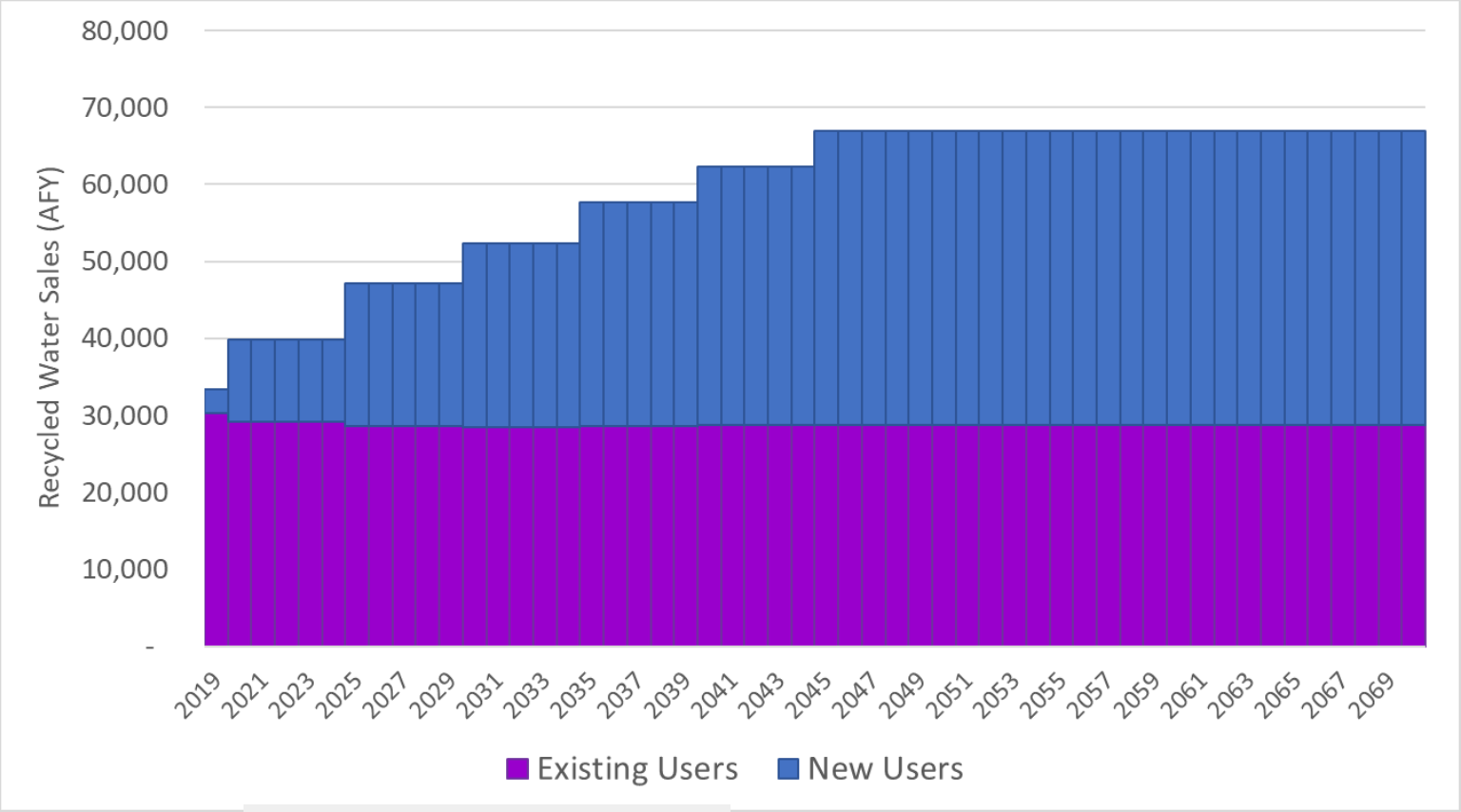
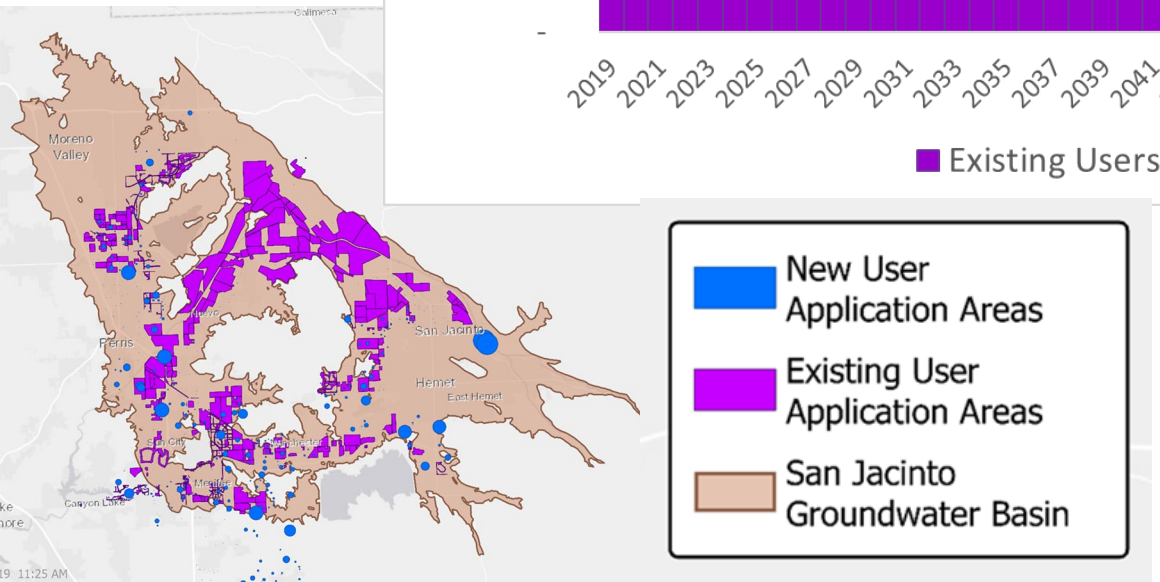
Recycled Water Sales Deliveries





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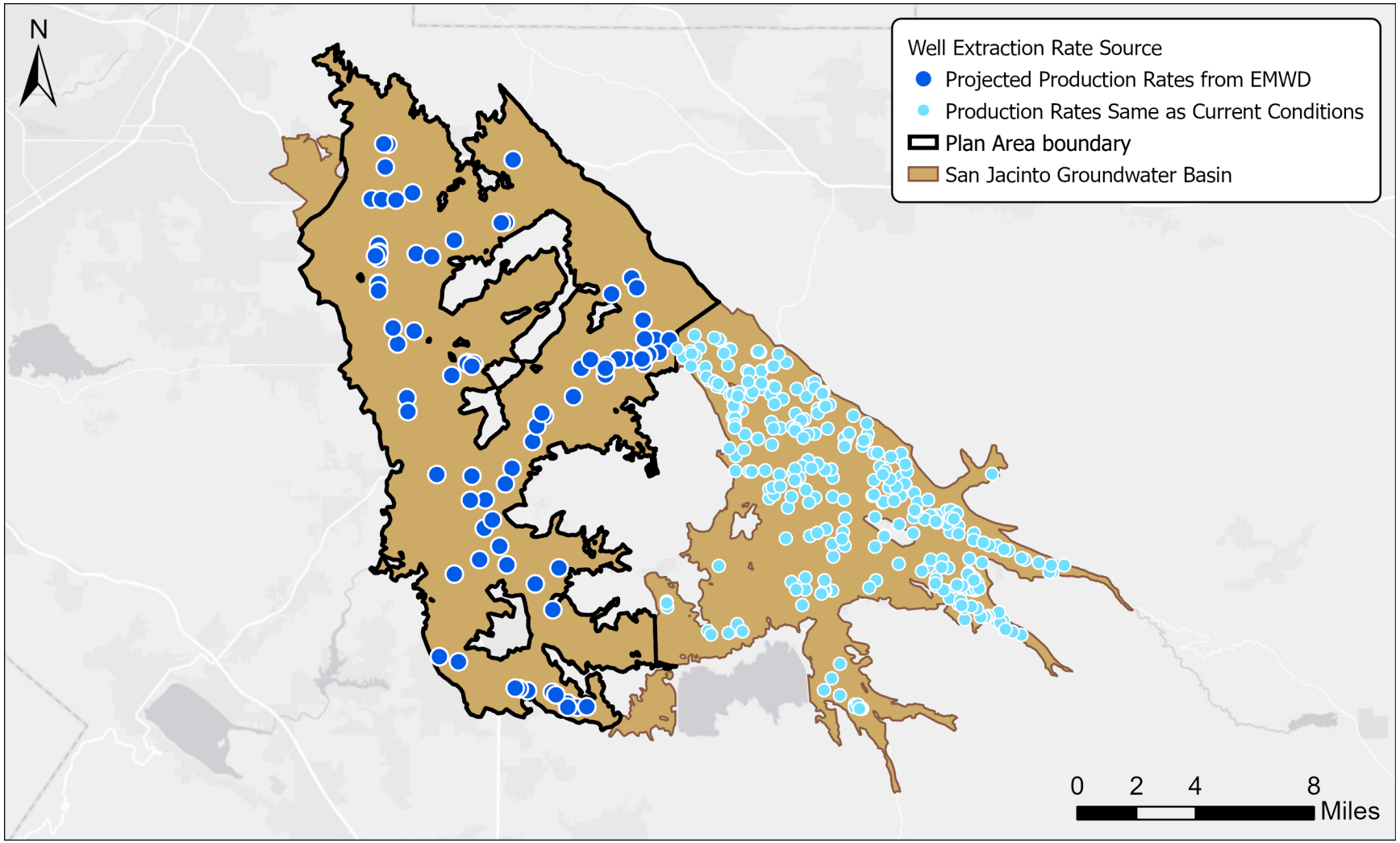
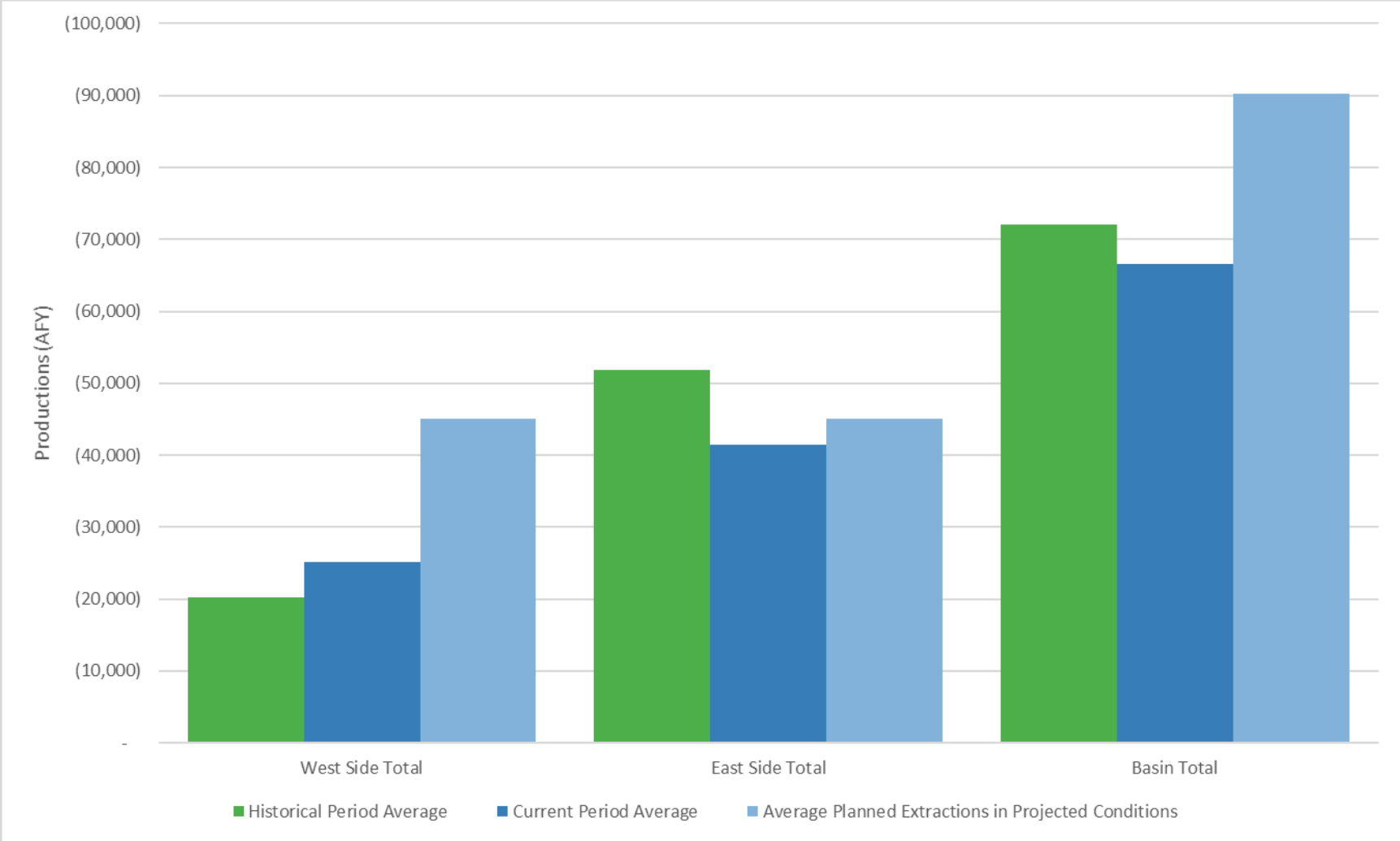
Groundwater Production Locations

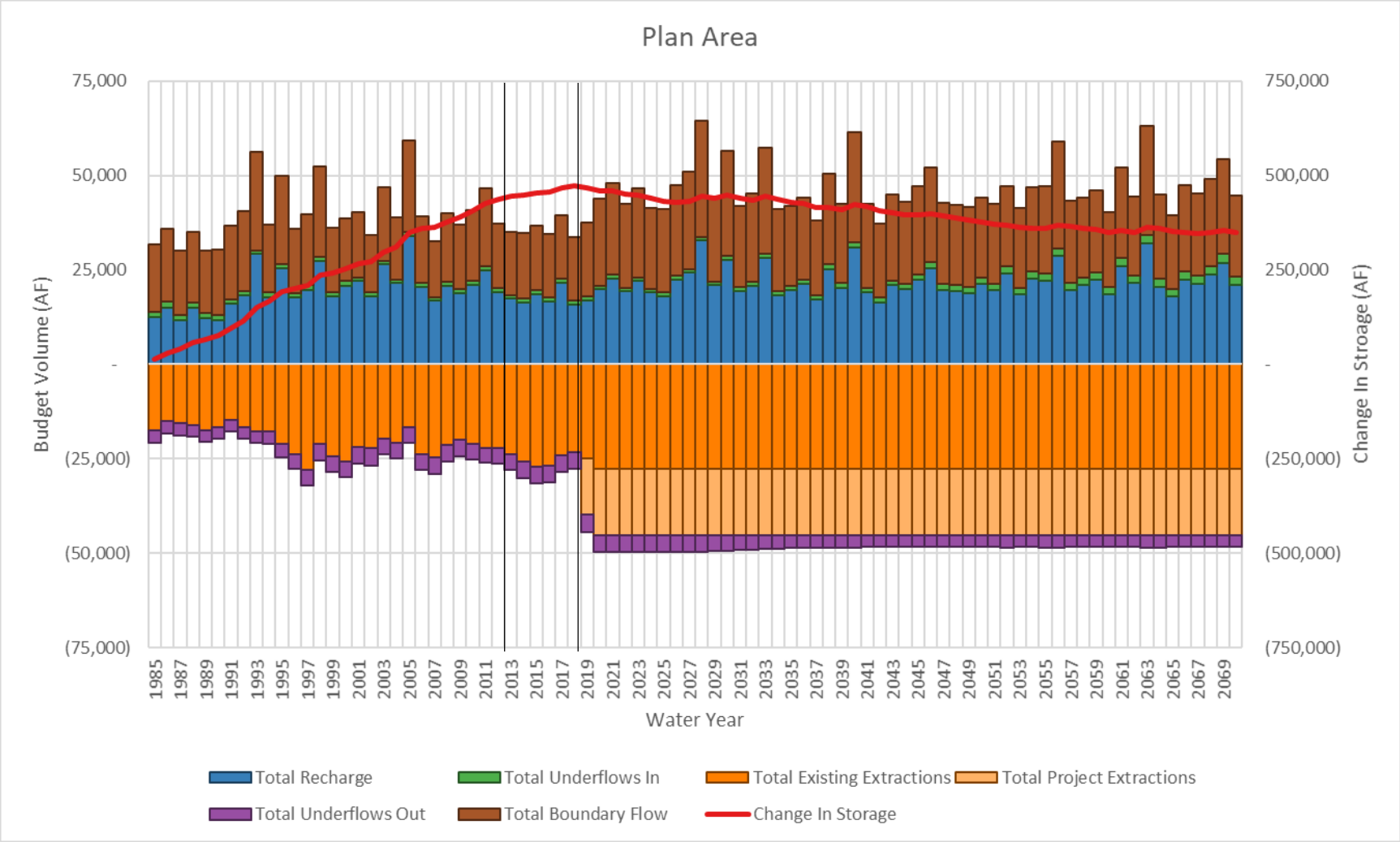


Groundwater Production in the Basin



Plan Area Water Budgets

Plan Area Summary

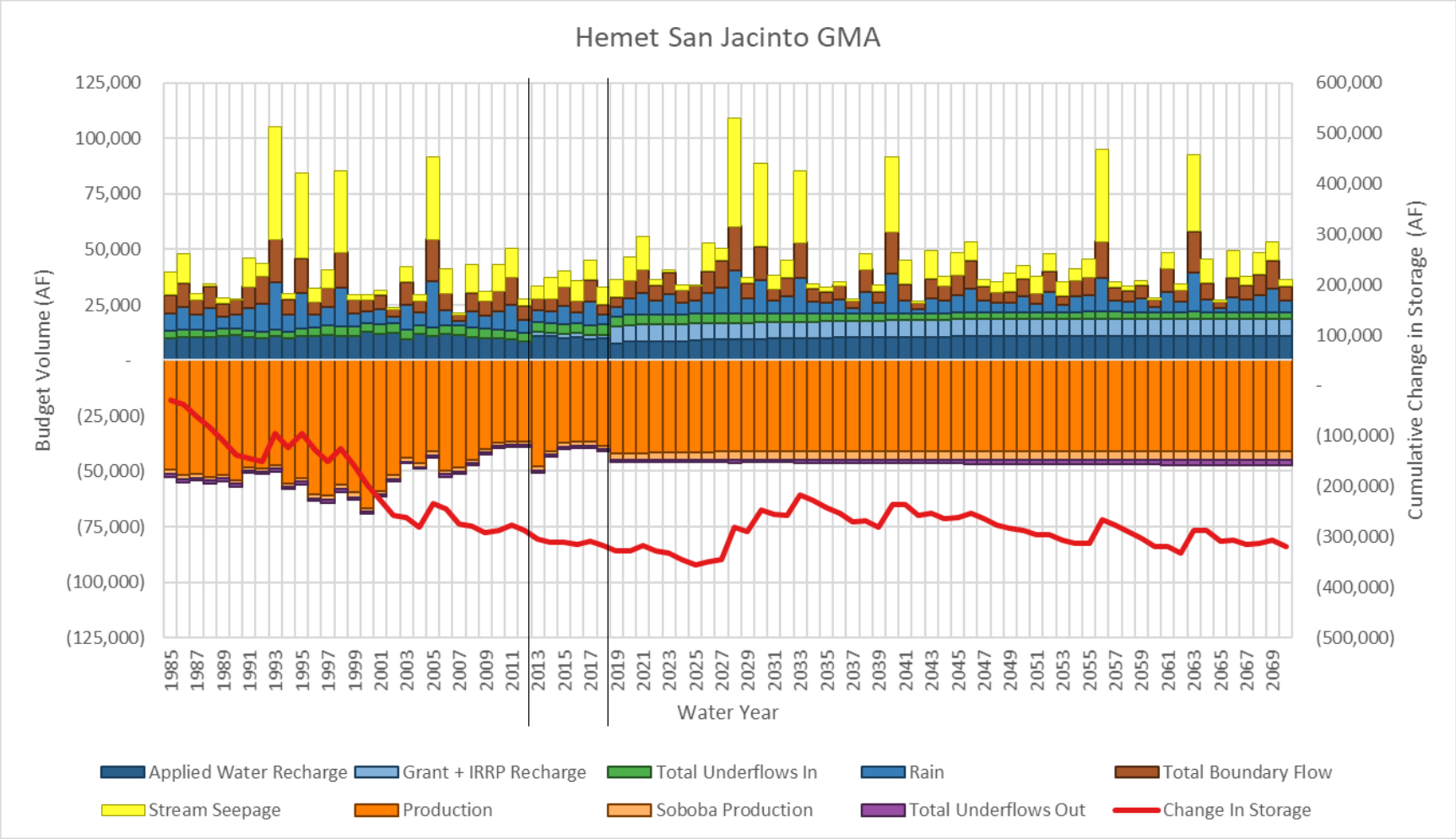


Plan Area Summary

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)	

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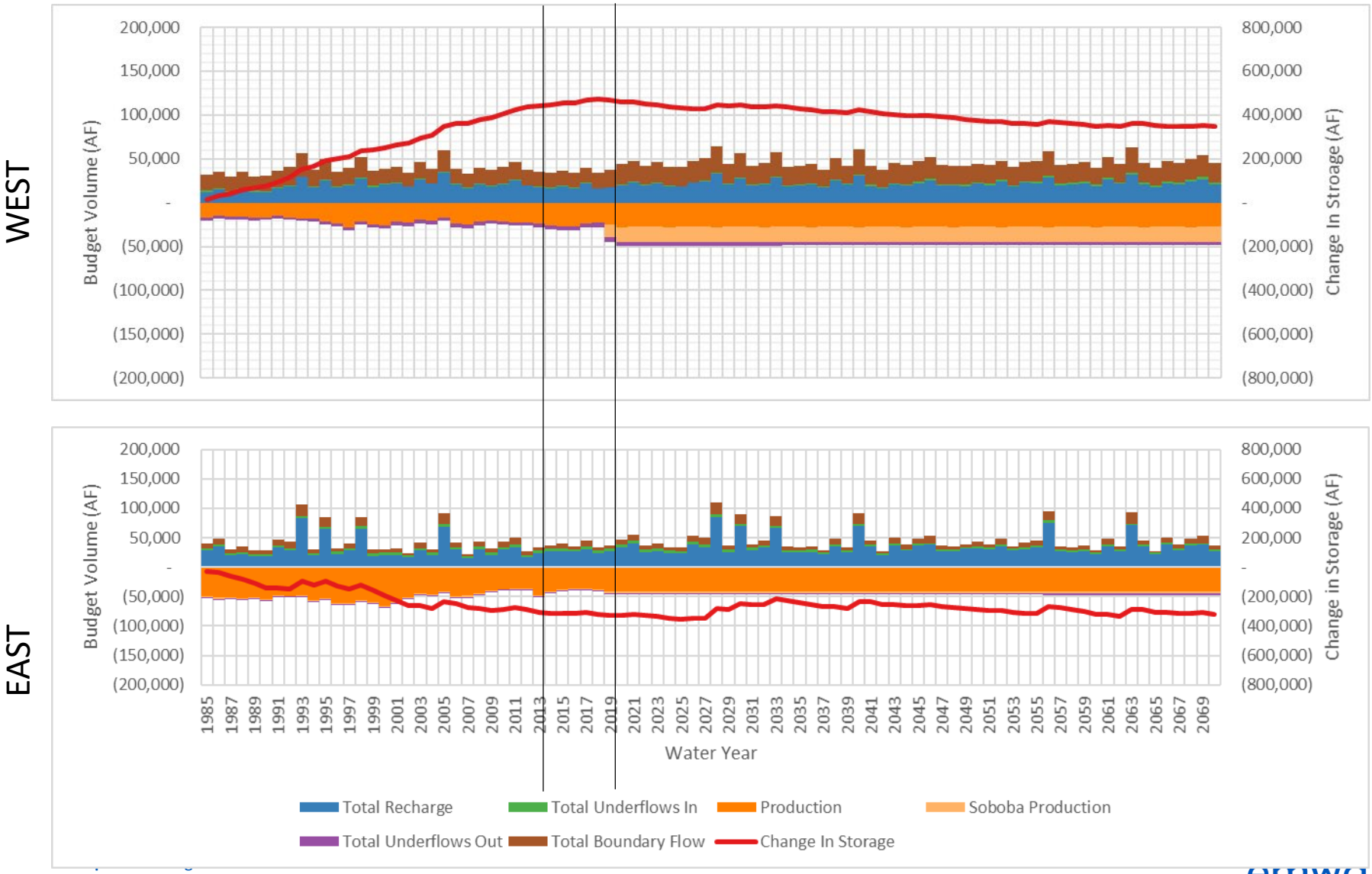
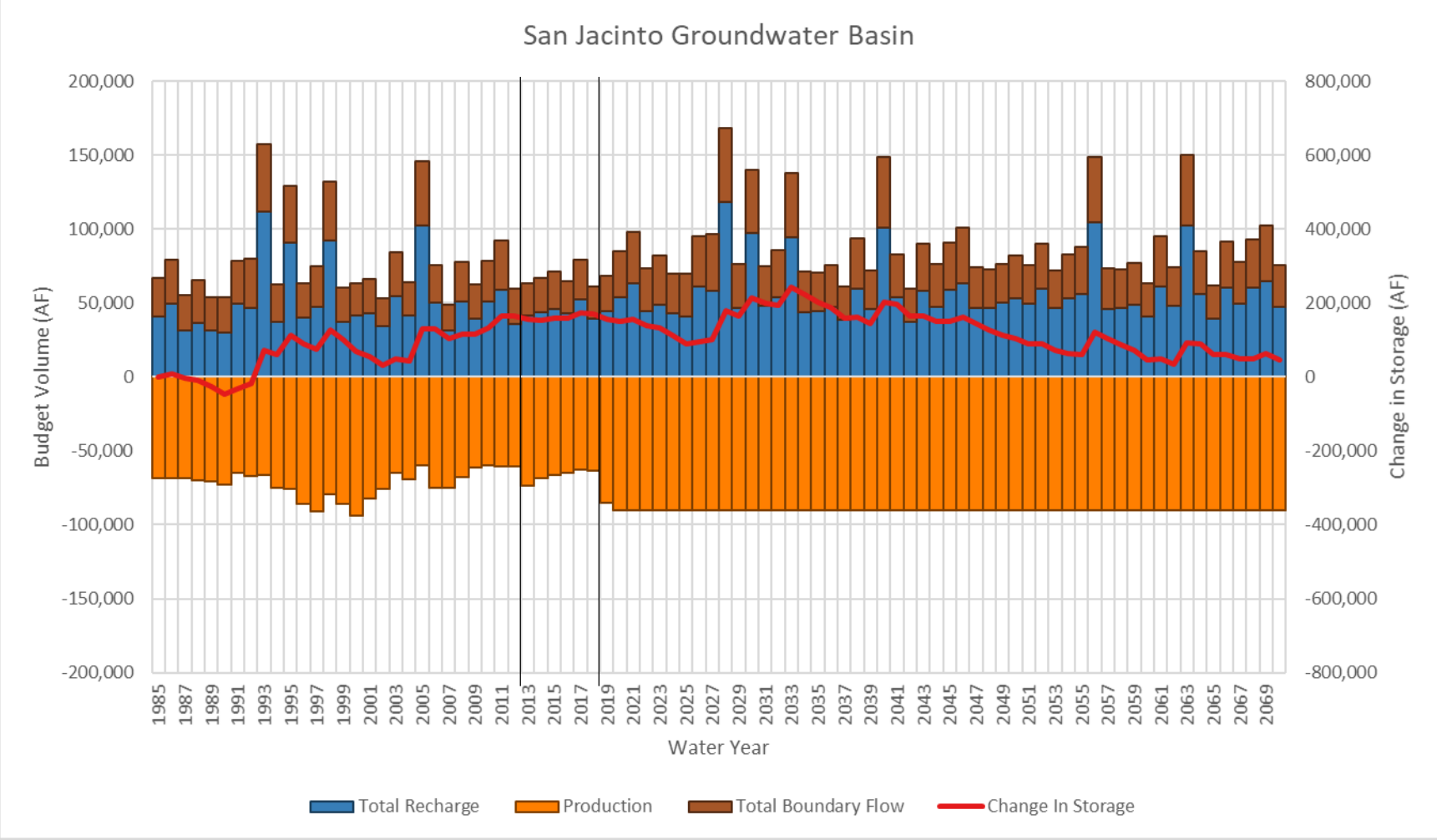
Total Water Budget

Total Water Budget – Parts of the Whole



Total Water Budget

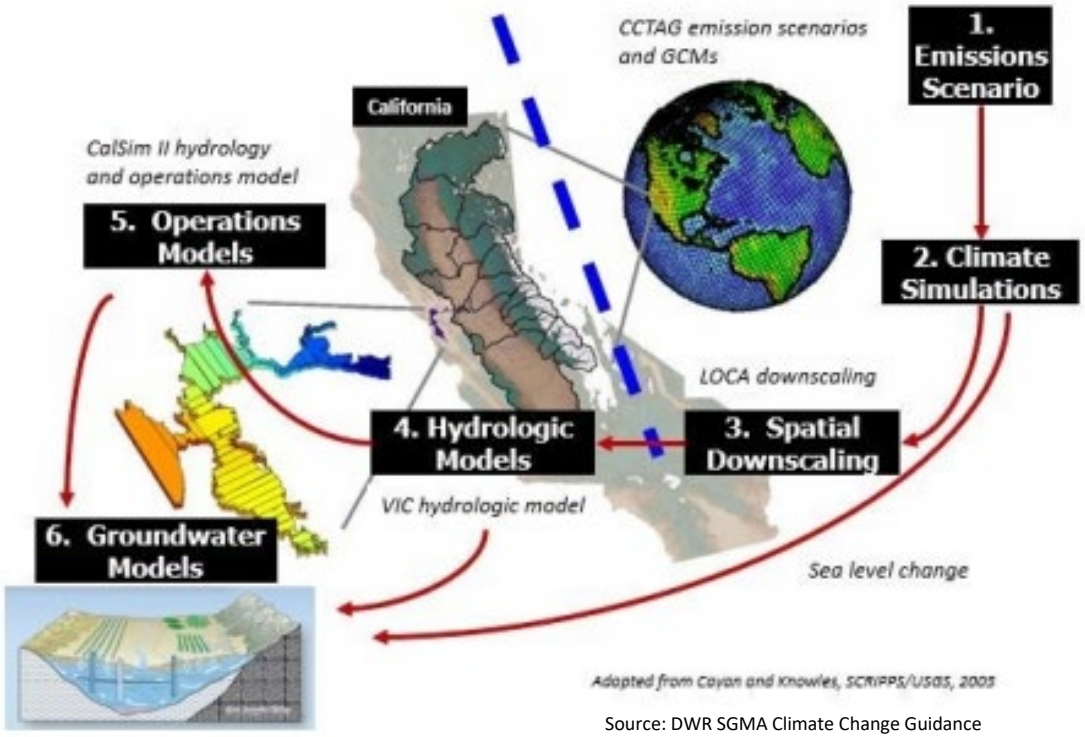


Total Water Budget

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)	

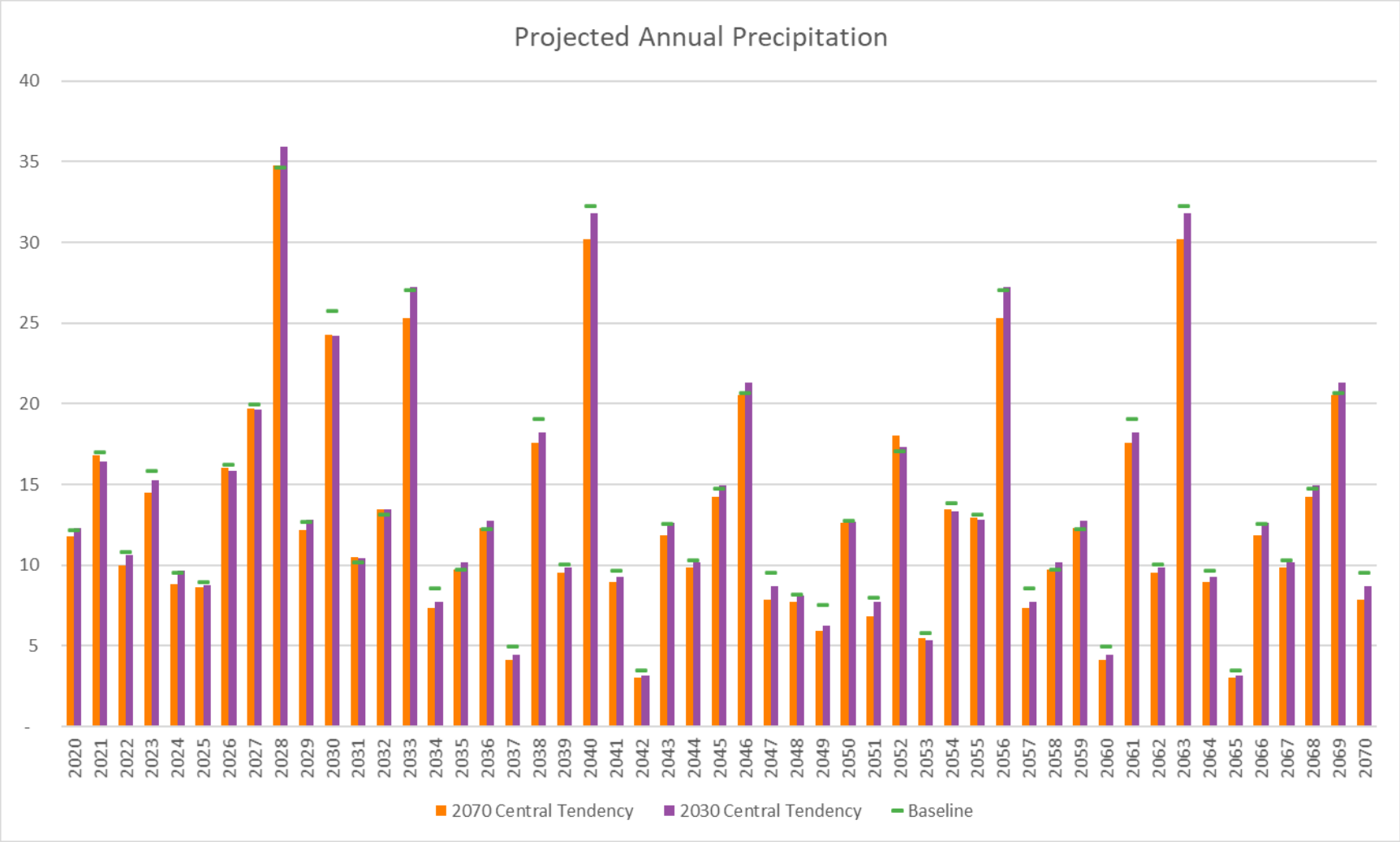
Climate Change Data Downscaling to Groundwater Model Applications

- 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

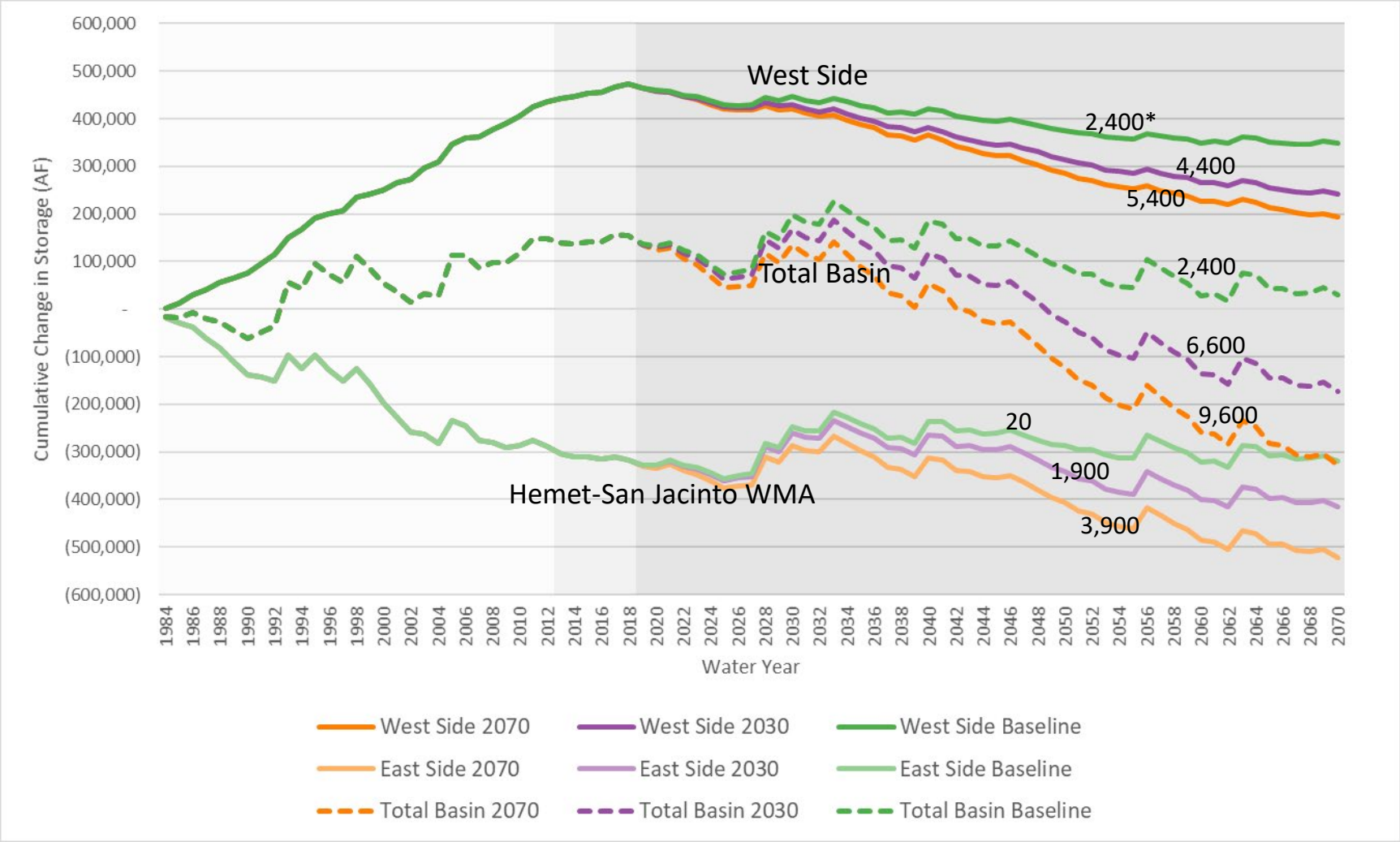
Changes to Precipitation



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

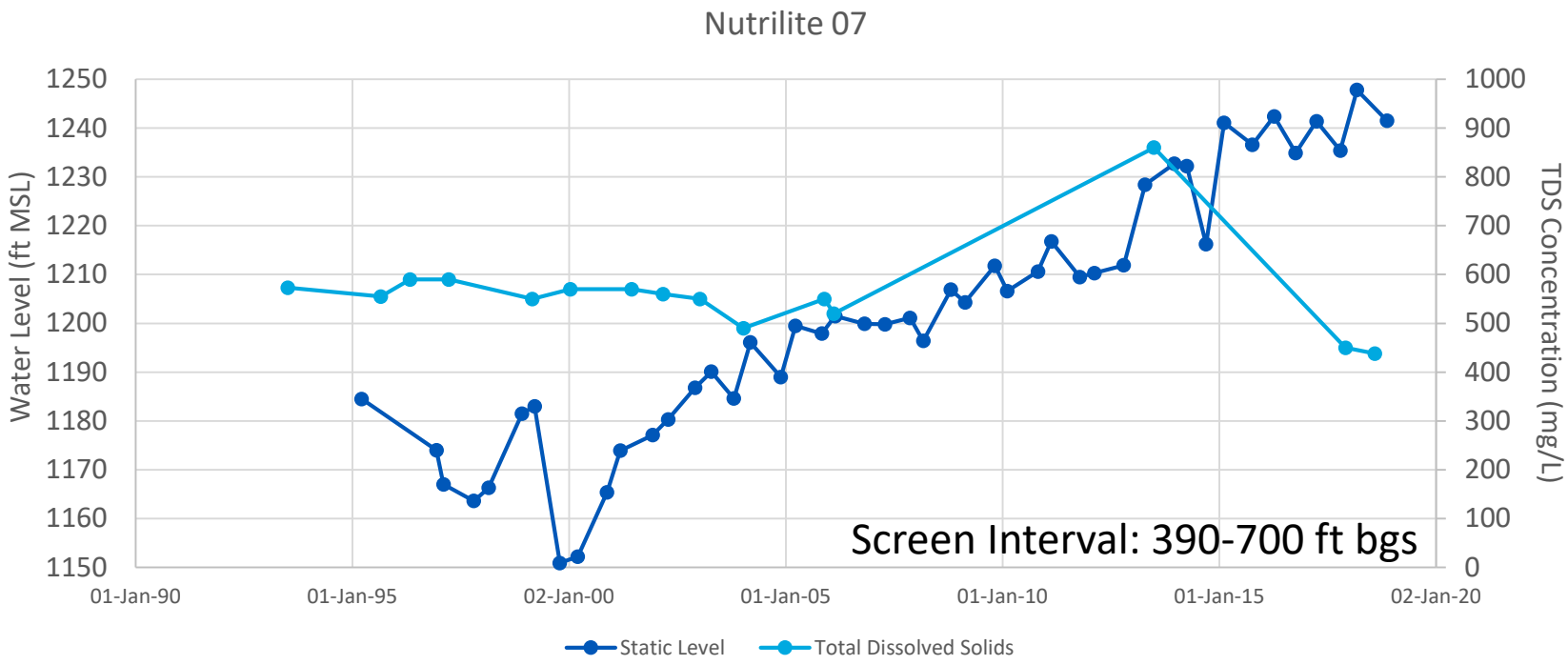
Interconnected surface water and groundwater – Not applicable

Water Quality
MT = TDS Concentration

Seawater Intrusion – Not applicable

Water Levels Not Appropriate Proxy

- Water level does not correlate with concentration



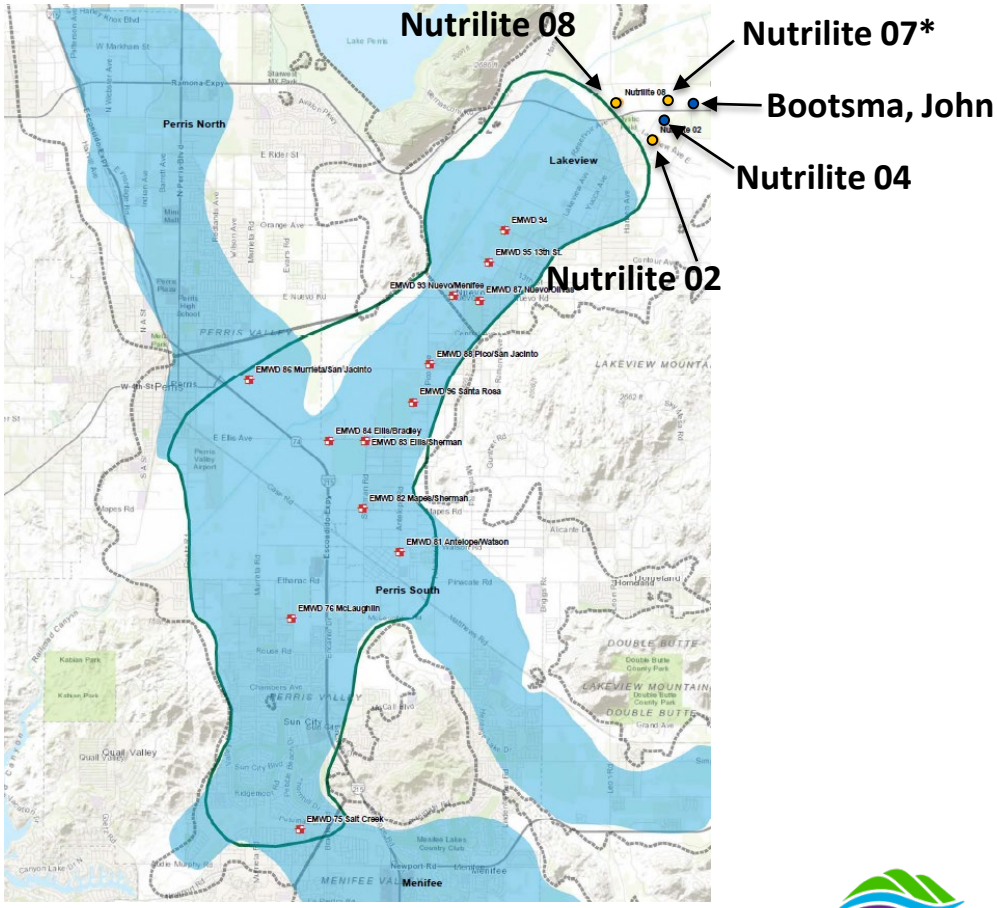
Water Quality General Undesirable Result

- 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

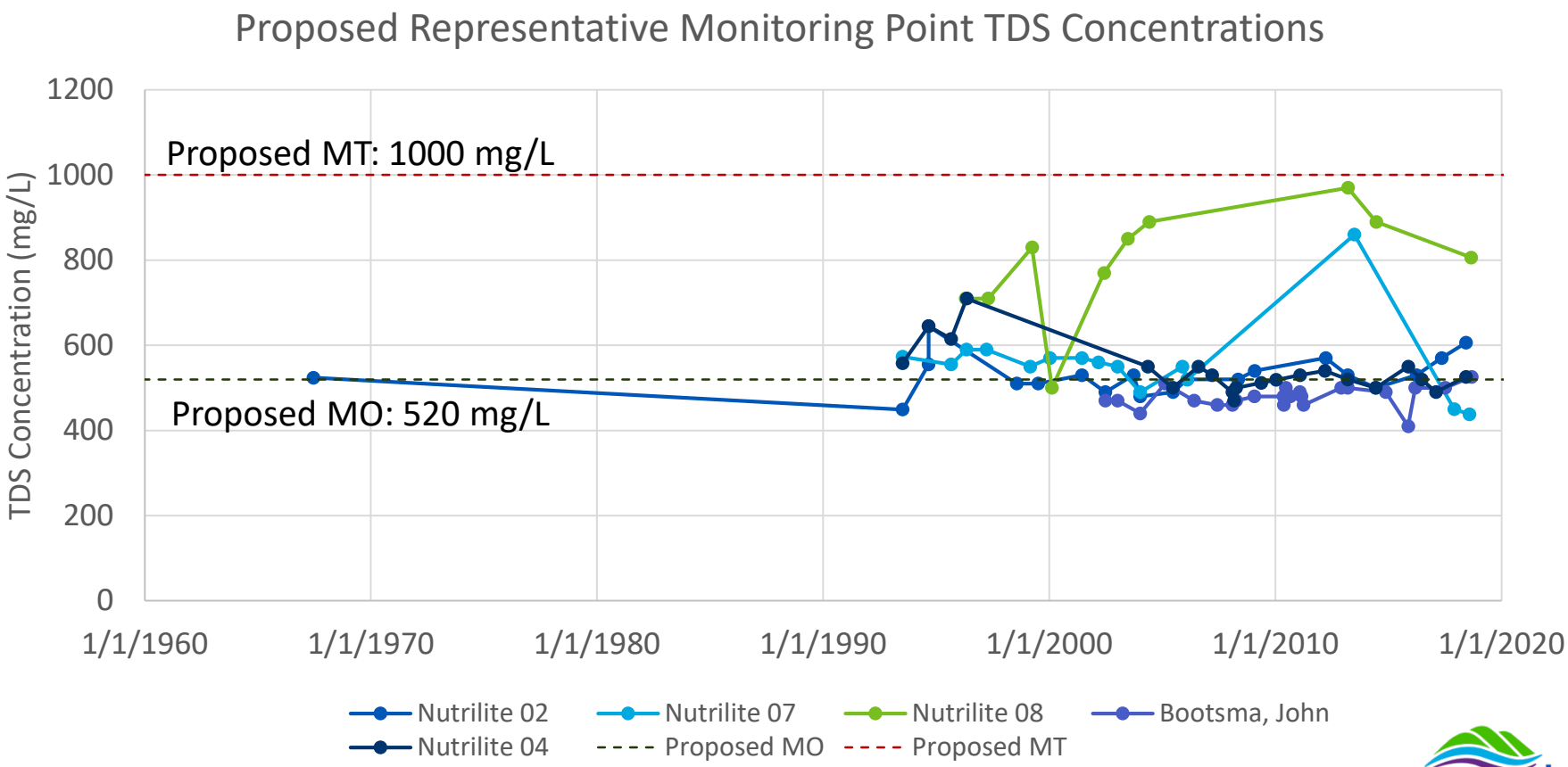
- Use Perris II Sentinel Wells: Nutrilite 02, 07*, and 08 as representative monitoring points for water quality
  - Already incorporated into existing water quality monitoring plan
- Also include wells: John Bootsma, and Nutrilite 04 as additional representative monitoring points for water quality
 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

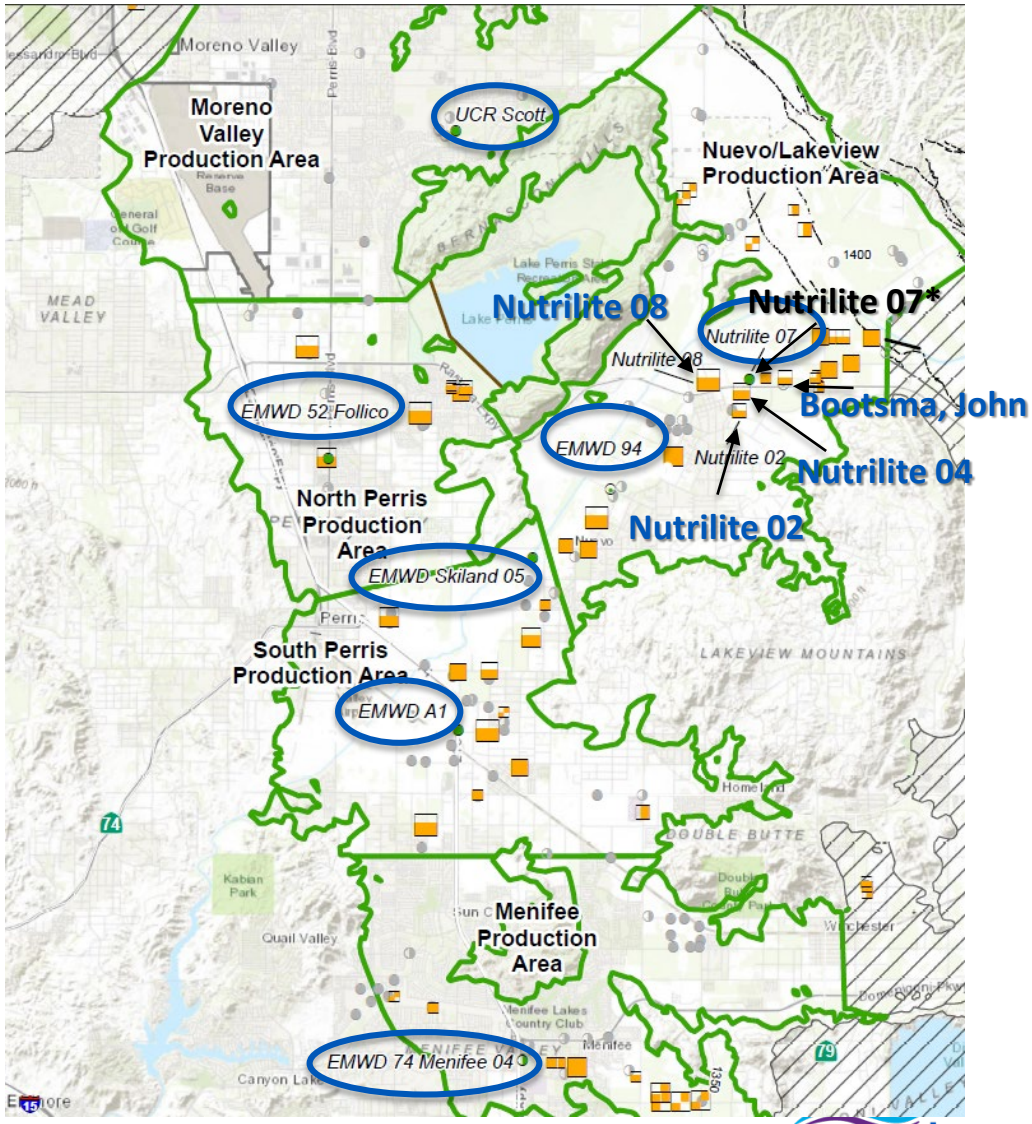
- Followed DWR guidance to propose *water level, groundwater in storage, and land subsidence* measurable objectives at each representative monitoring point
- Need to define measurable objective for groundwater quality

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

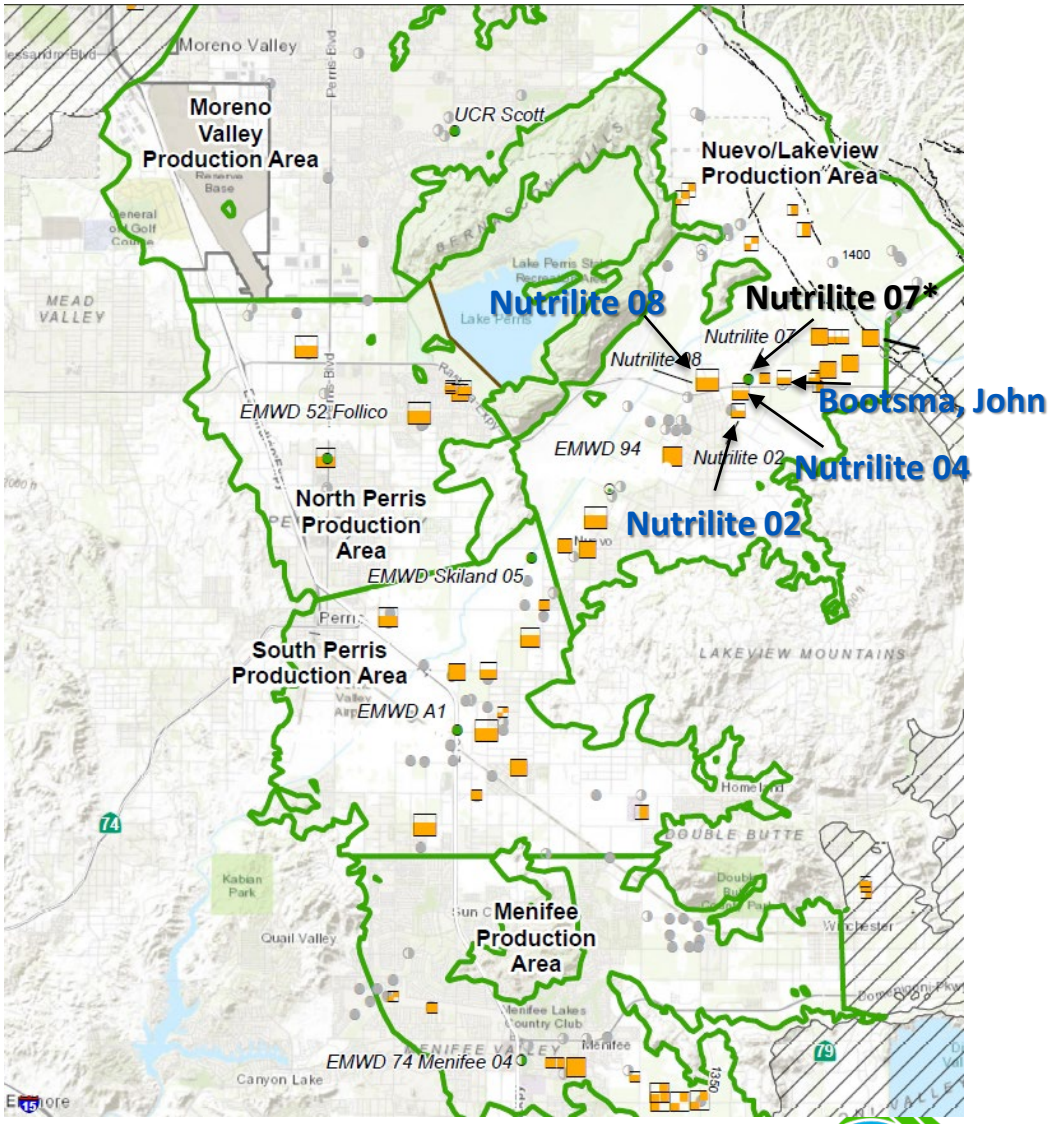
Undesirable Results

- 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).



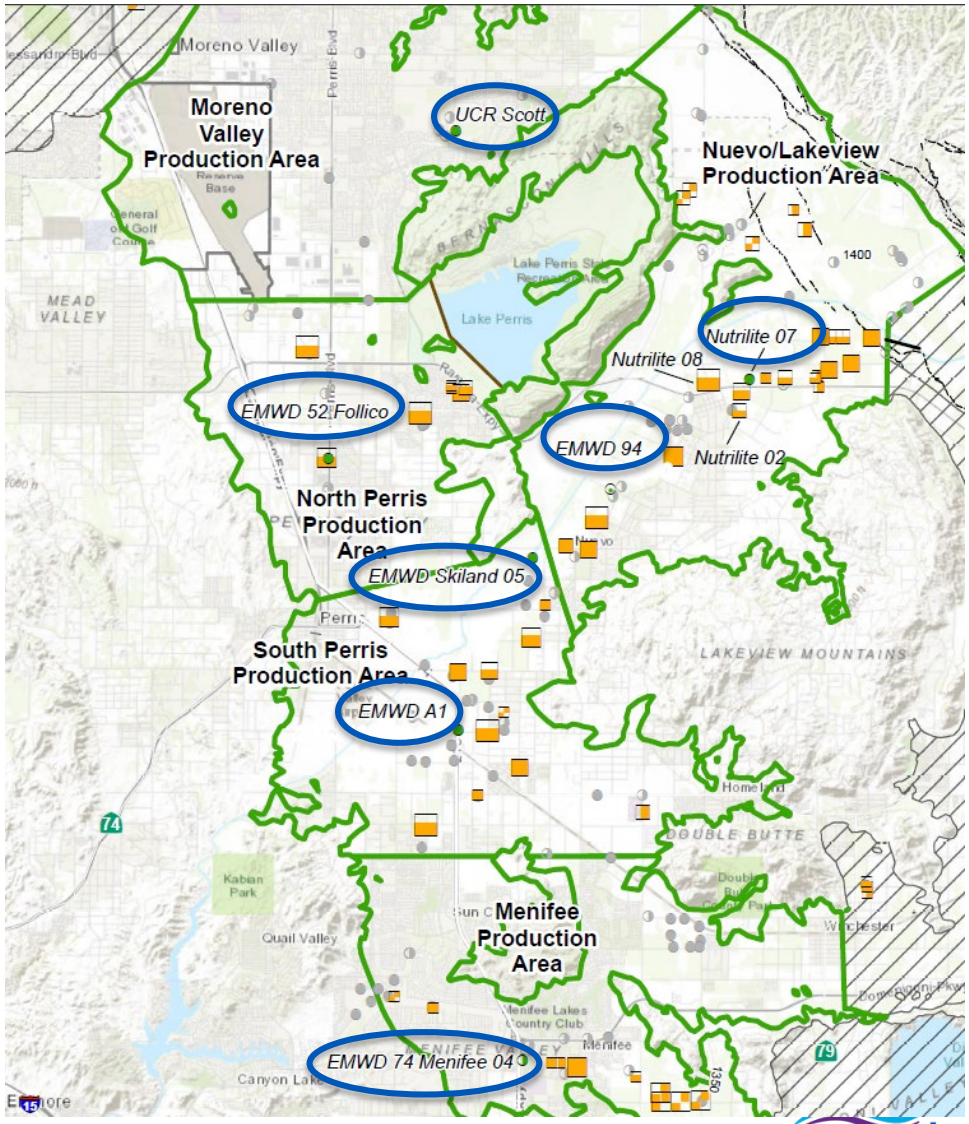
Undesirable Results: Water Quality

- 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?

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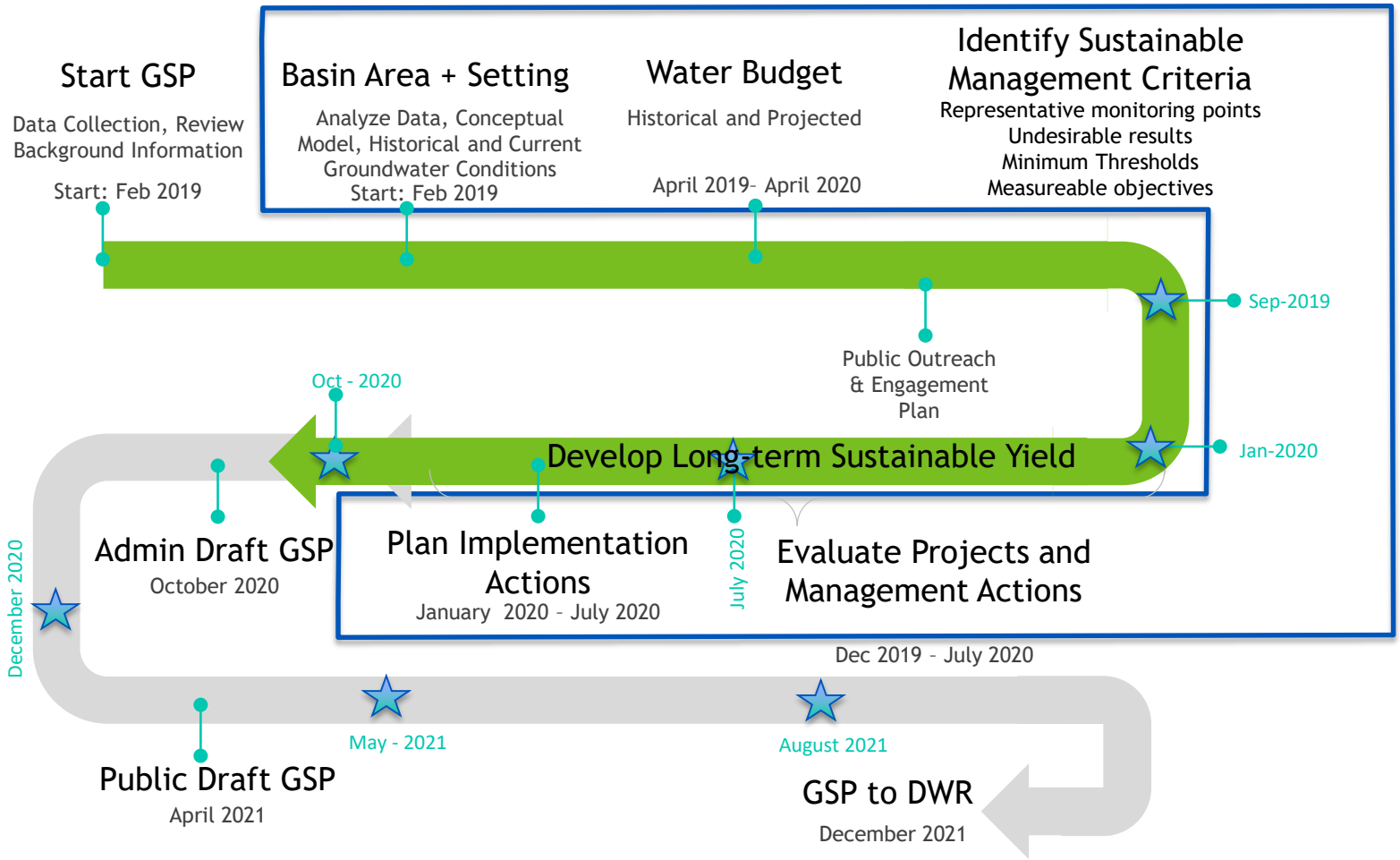
Projects and Management Actions

- 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