ARROYO SANTA ROSA GROUNDWATER SUSTAINABILITY AGENCY

GROUNDWATER SUSTAINABILITY PLAN WORKSHOP NO. 2

CAMROSA WATER DISTRICT

OCTOBER 24, 2022

WORKSHOP AGENDA

No.	TIME	TOPIC
1	6:00 – 6:05 pm	Welcome and ASRBGSA Chair Opening Comments
2	6:05 – 6:10 pm	Agenda Review
3	6:10 – 6:15 pm	Get to Know the Stakeholders (Attendee Polls Nos. 1 - 4)
4	6:15 – 6:30 pm	Workshop No. 1 Recap & Schedule Review • Presentation • Q & A
5	6:30 – 6:45 pm	Monitoring Networks & Sustainable Management Criteria • Presentation • Q & A
6	6:45 – 7:00 pm	Projects and Management Actions • Presentation • Q & A
7	7:00 – 7:15 pm	• Stakeholder Questions and Feedback • Attendee Poll Nos. 5-6
8	7:15 – 7:25 pm	Executive Director and Board Member Comments
9	7:25 – 7:30 pm	Wrap-up

ATTENDEE POLLS 1 - 4

WORKSHOP NO. 1
RECAP

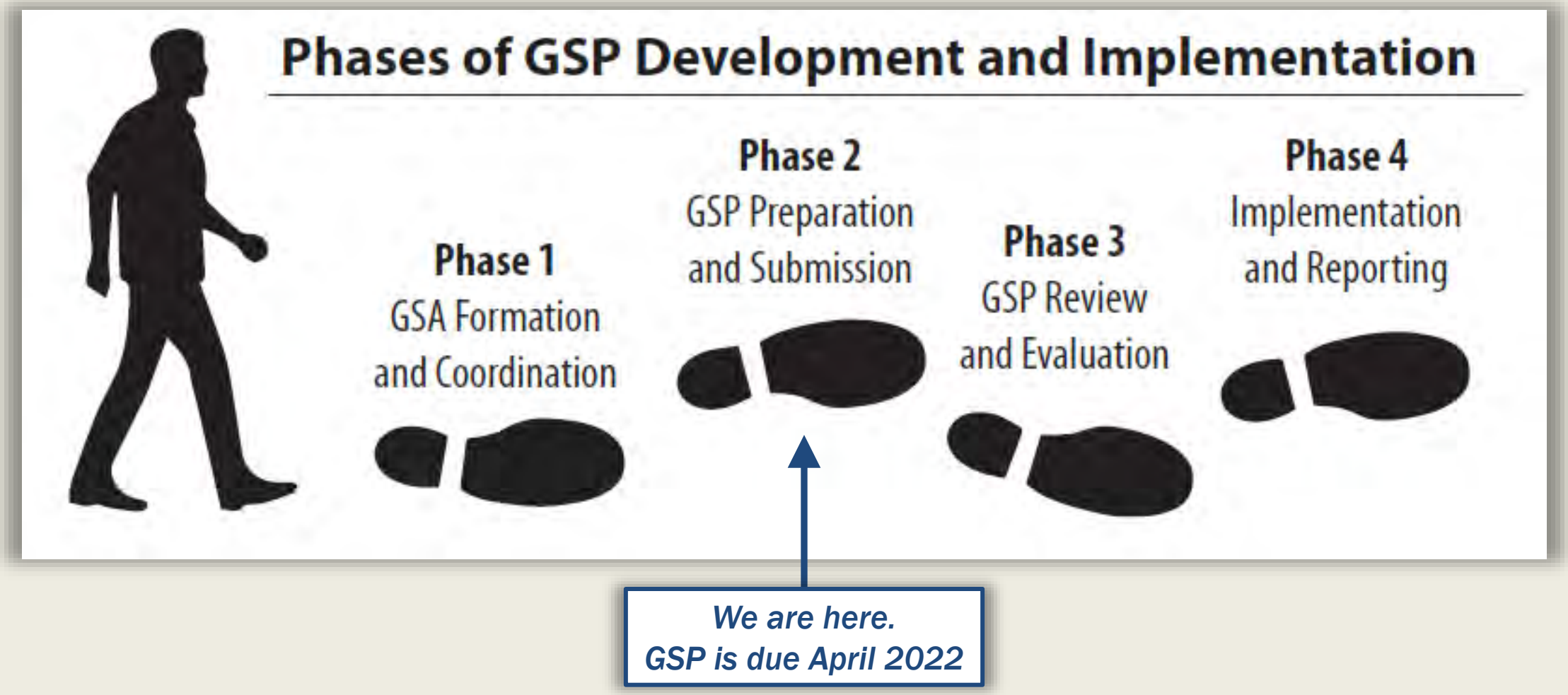
WORKSHOP NO. 1 RECAP

- Introduction to SGMA and GSPs
- Groundwater Basin Setting Summary
- Sustainable Management Criteria Overview

WHAT IS SGMA?

- Sustainable Groundwater Management Act
  - Three bill package signed into CA law in late 2014, replacing prior groundwater management legislation (AB 3030)
  - Provides a statewide framework for long-term sustainable groundwater management in CA
  - Requires basins subject to the act or that voluntarily opt in to be managed sustainably 20 years after adopting a Groundwater Sustainability Plan (GSP) by a local Groundwater Sustainability Agency (GSA)

WHAT DOES SGMA REQUIRE?



HISTORY OF SGMA IN ASRV BASIN

Initial basin priority was medium, making the basin subject to SGMA.

- ASRBGSA formed in 2016 to comply with SGMA

Initial efforts to prepare GSPs by FCGMA and ASRBGSA commenced.

Basin was reprioritized to low in 2019, making SGMA implementation optional.

- GSP put on hold.

ASRBGSA has voluntarily resumed work on a GSP under SGMA.

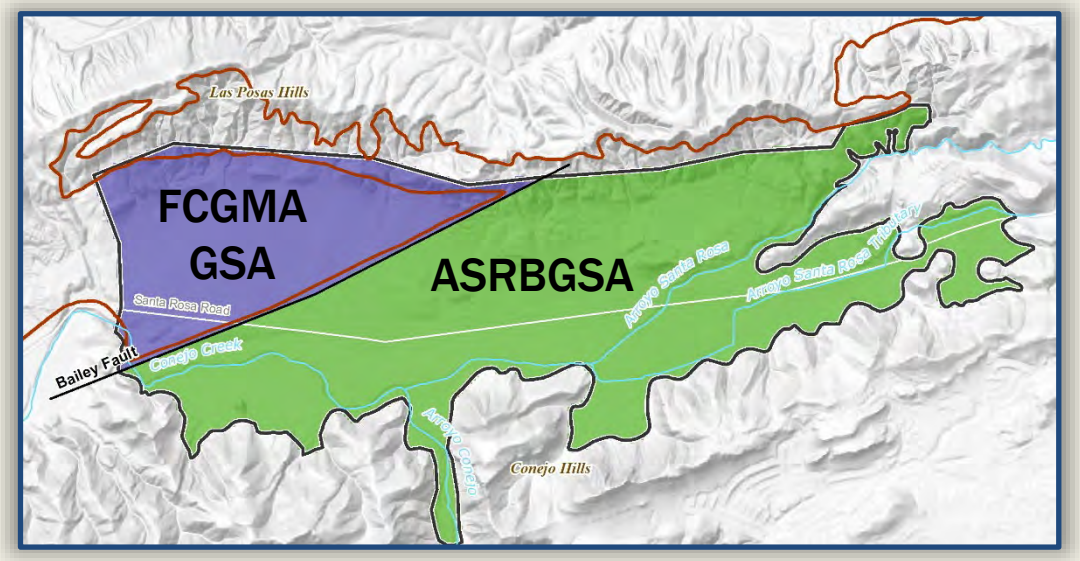
- GSP scheduled for completion in April 2023.

WHY DEVELOP AND IMPLEMENT A GSP?

- Basin has been managed under prior legislation since 1987
- SGMA is the only option for continued groundwater management.
- Continued groundwater management to:
  - Be good stewards of the Basin
  - Ensure reliability of local water supplies
  - Create more opportunities to enhance the basin (access to grants)

WHO WILL MANAGE ASRV BASIN GROUNDWATER?

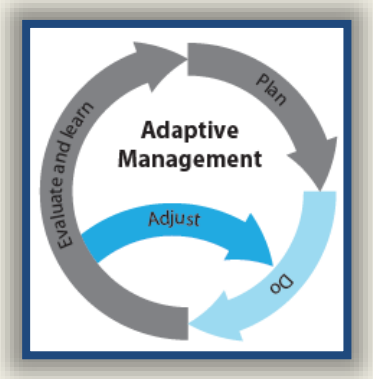
- Fox Canyon GMA
  - Special Act District formed in 1982
- ASRBGSA
  - Formed in March 2016 under a Joint Powers Authority Agreement between Camrosa Water District and Ventura County



A single GSP will be adopted by both GSAs for coordinated management of the entire basin

KEY SGMA CONCEPTS

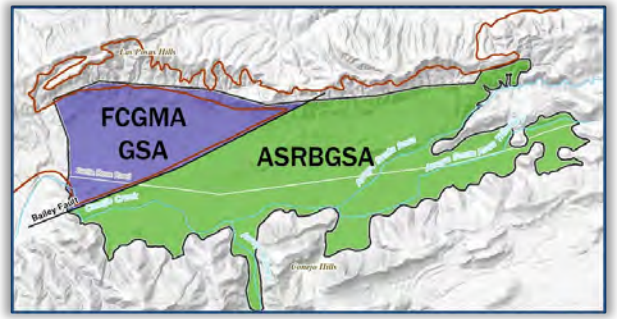
- Overarching goal is to avoid undesirable results for six sustainability indicators,
- Undesirable results and actions to prevent them are defined by the GSAs, not the State
- SGMA requires data-driven management:
  - GSP must be developed with best available science and sustainability is demonstrated with monitoring data
- SGMA requires adaptive management
  - Updates required every 5 years



WHAT IS A GSP?

- The GSP is a flexible road map for how a groundwater basin will achieve long term sustainability by avoiding undesirable results through data-driven adaptive management
- GSP Requires Contents:
  - Administrative Information
  - Basin Setting
  - Sustainable Management Criteria
  - Monitoring Networks
  - Projects and Management Actions
  - Implementation

Draft
Arroyo Santa Rosa Basin
Groundwater Sustainability Plan



CAMROSA WATER DISTRICT

WHO IS DEVELOPING THE GSP?

- ASRBGSA and FCGMA will review & adopt the GSP
- GSP Development Team:

BONDY
Groundwater Consulting, Inc.

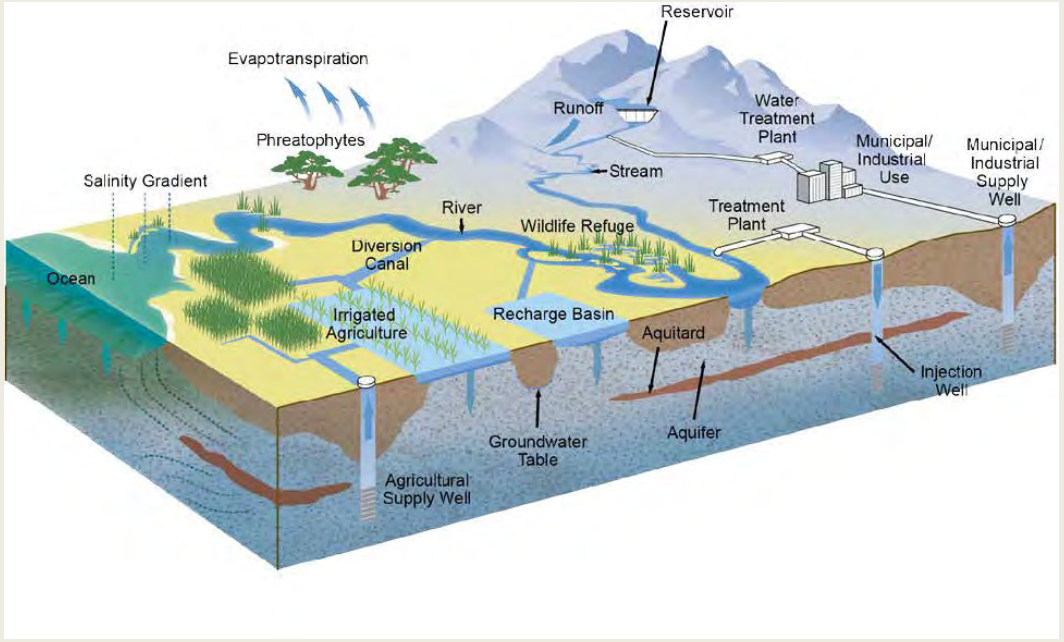
Bryan Bondy, PG, CHG
GSP Manager and GSP Contributor

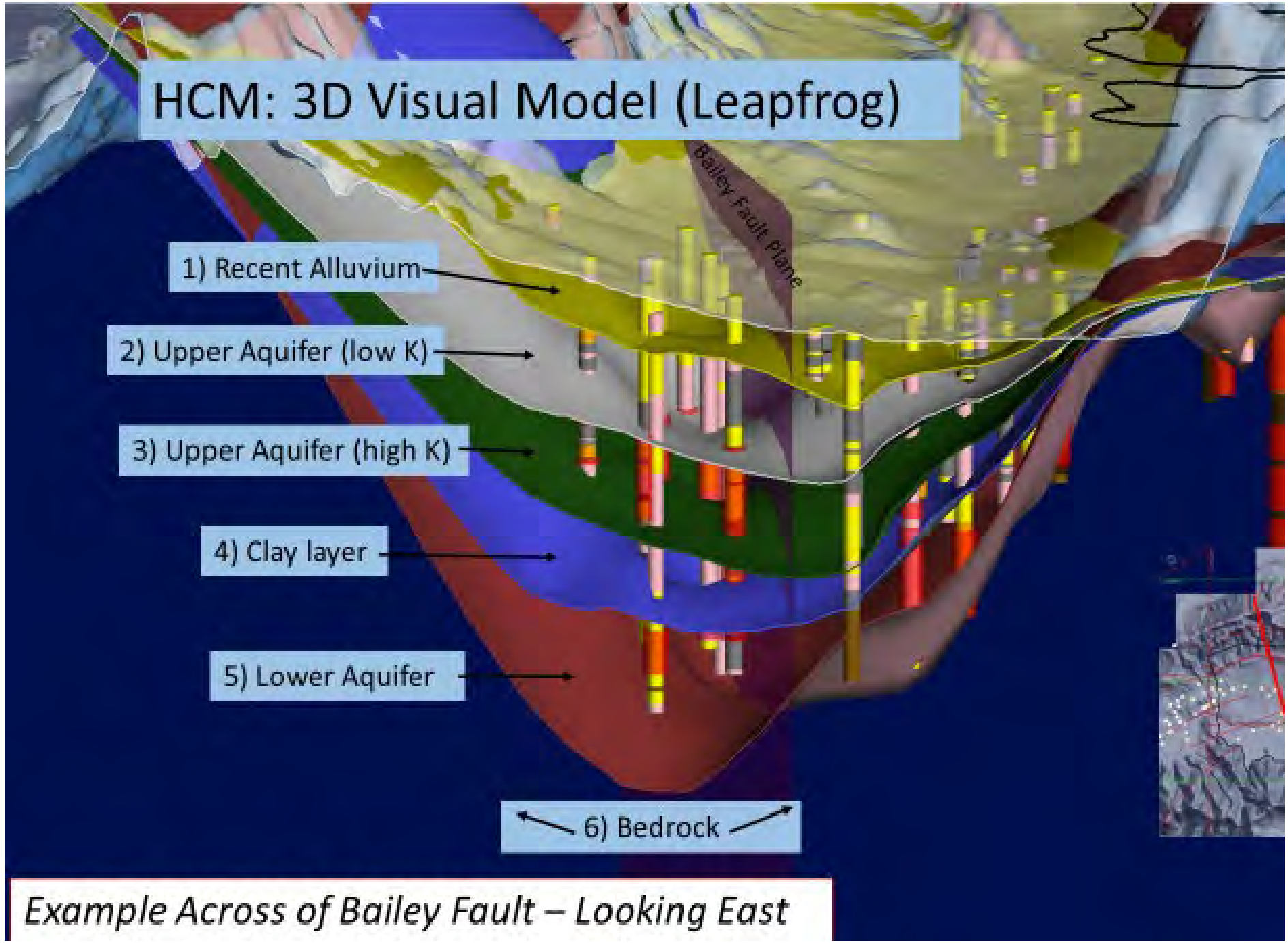
INTERA
GEOSCIENCE & ENGINEERING SOLUTIONS

Abhishek Singh, PhD, PE & staff
Quantitative Analysis / Modeling
GSP Contributor & Document Lead

SMC DEVELOPMENT SUPPORTED BY A COMPREHENSIVE HYDROGEOLOGIC CONCEPTUAL MODEL

- Physical Characteristics of Regional Geology and Hydrology:
  - Land Use
  - Geologic Structure of Units
    - Faults, Folds, Bedrock vs. Alluvium
  - Hydrostratigraphy
    - Aquifers and Aquitards
    - Material properties
  - Boundary Conditions
  - Groundwater Quality
  - Recharge and Discharge Processes



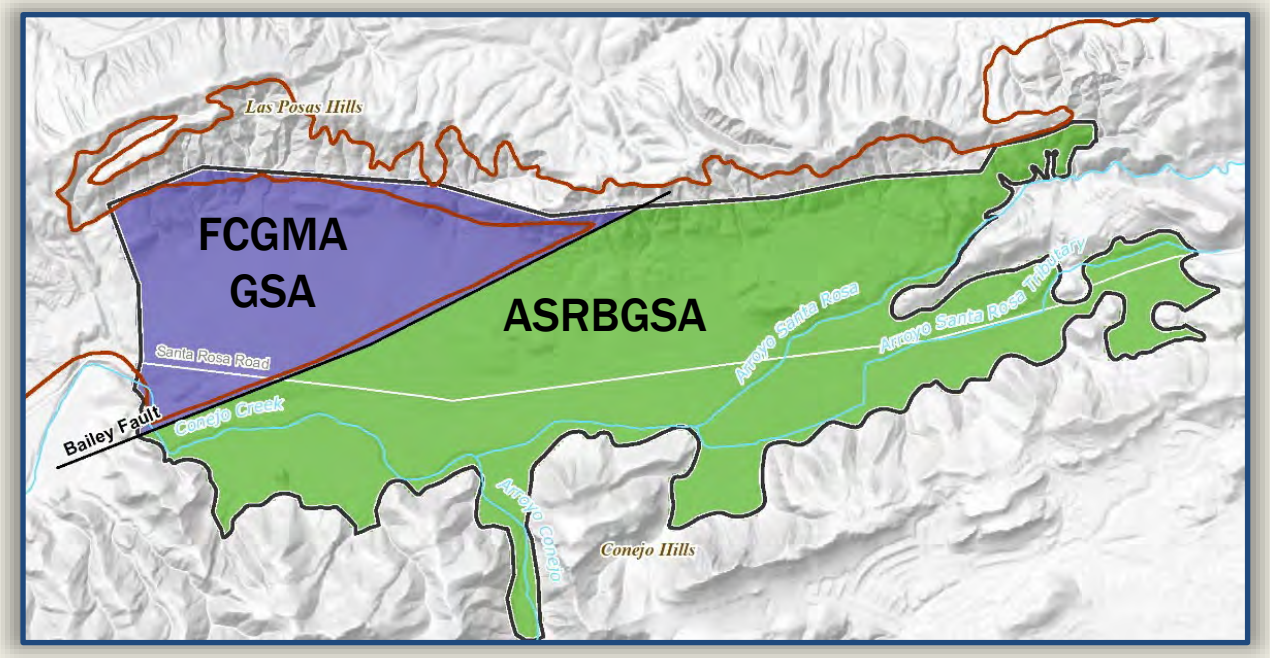


KEY BASIN SETTING INFORMATION FOR SUSTAINABLE MGMT. CRITERIA

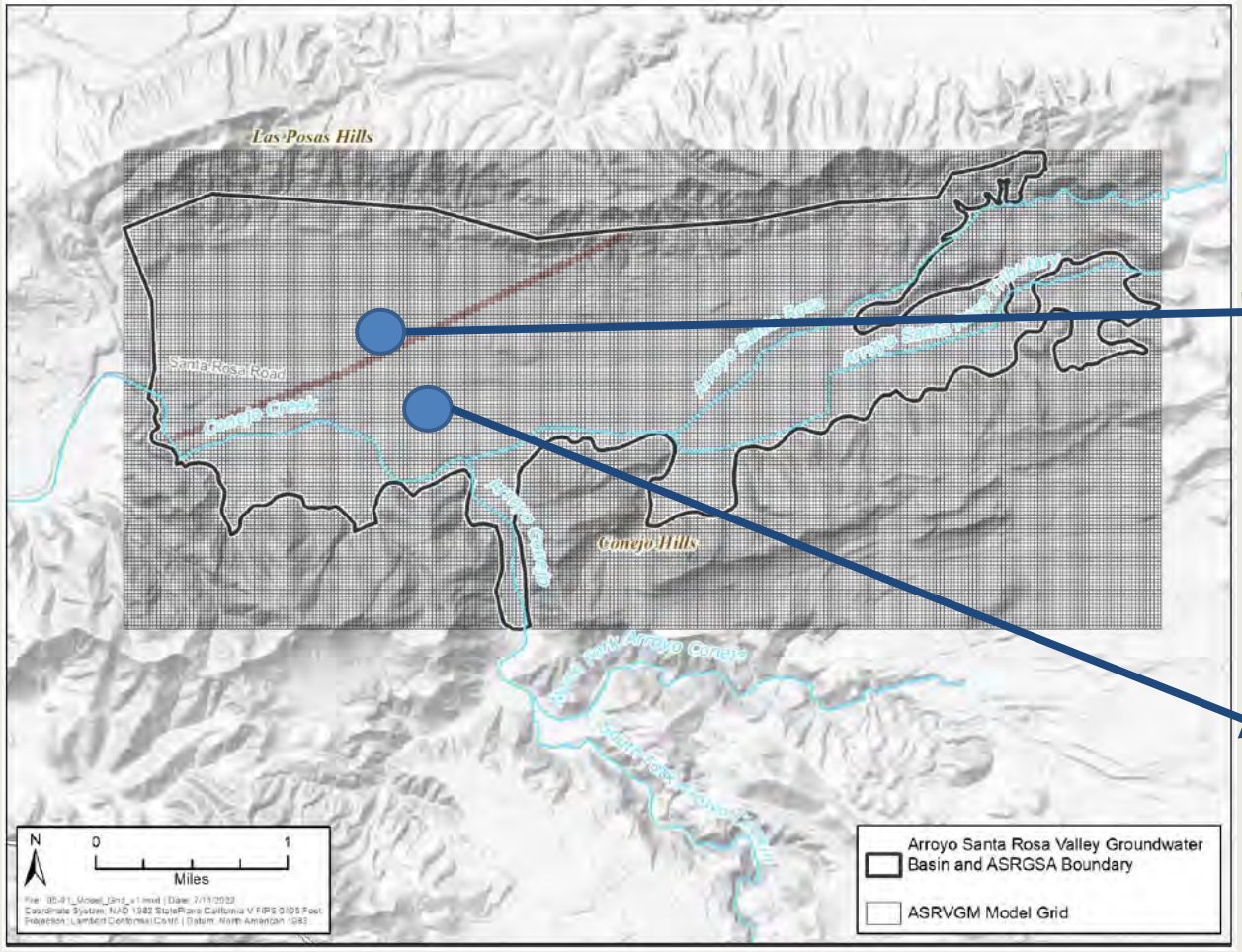
- Complex basin stratigraphy
  - 6 layers identified
  - Most pumping and data are from “lower aquifer” (layer 5)
  - GSP addresses layers 1 -5

BASIN SUBDIVIDED INTO TWO SUBBASINS

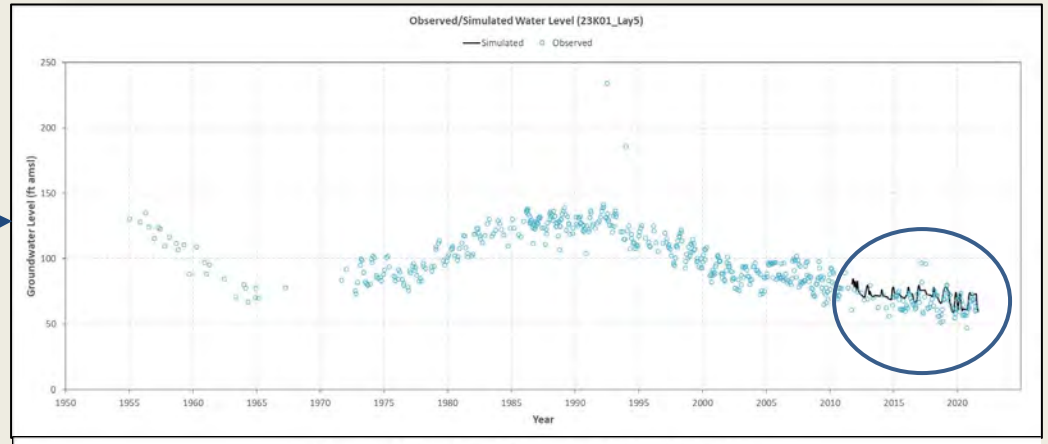
- Bailey Fault splits the basin into two subbasins that appear to have limited hydraulic connectivity
- Subbasins are generally coincident with the to GSA areas and will be treated as separate management areas

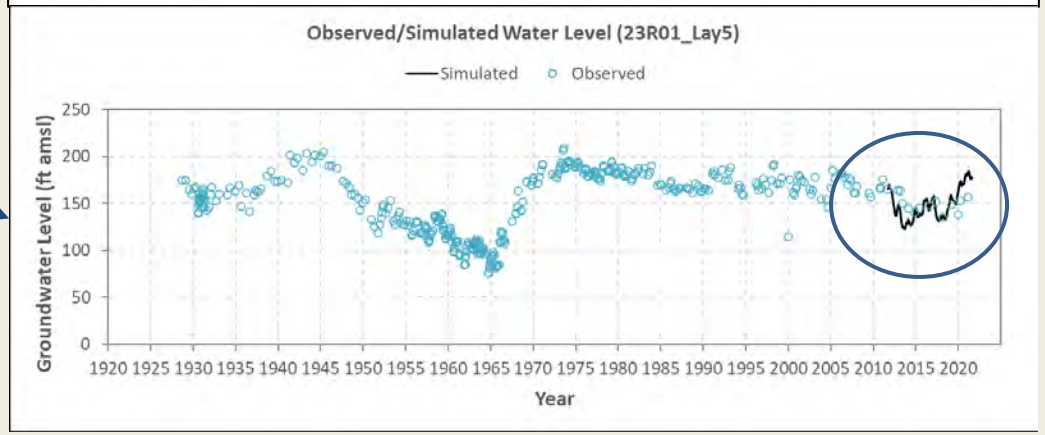


SMC DEVELOPMENT SUPPORTED BY NUMERICAL MODELING



Example Model Calibration Graphs



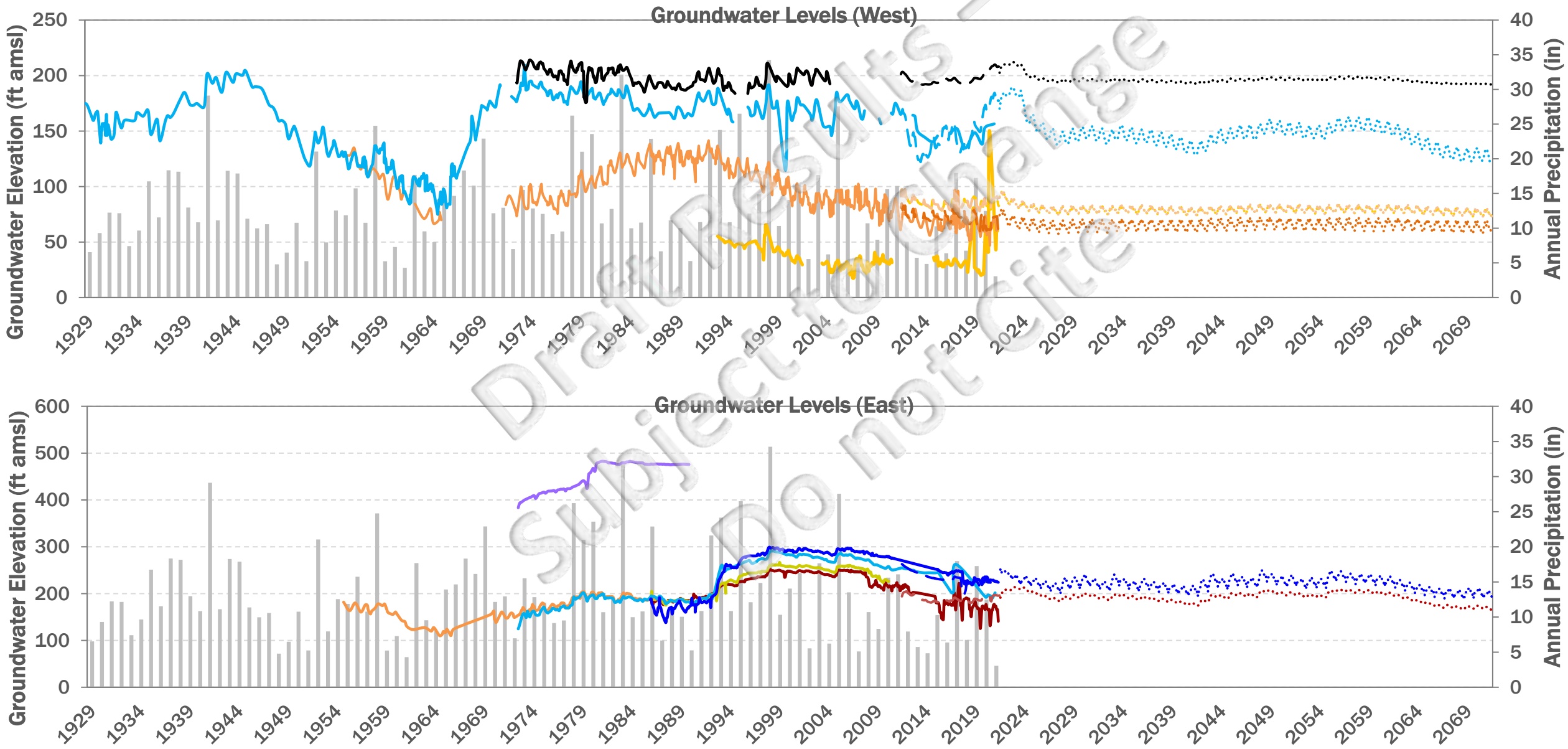


SMC DEVELOPMENT SUPPORTED BY COMPREHENSIVE WATER BUDGETS FOR THE BASIN

- Quantification of inflows and outflows to/from the basin
  - Consideration of future land use, population, and climate change
- Basin appears to be in balance
  - Calculated deficits are small and within error range of model accuracy

GW Budget Period	GW Inflows (AFY)	GW outflows (AFY)	Change in GW Storage (AFY)
Historical (2012-2021)	4,510	4,639	-129
Current (2019-2021)	4,506	3,459	1,047
Projected (50 years based on 1972-2021)	5,107	5,236	-130
Projected with 2030 Climate Change	5,179	5,311	-132
Projected with 2070 Climate Change	5,283	5,413	-130

SMC SUPPORTED BY HISTORICAL AND PROJECTED DATA



GSP DEVELOPMENT SCHEDULE SUMMARY

Please don't wait for the draft GSP to make comments. Your input will be more effective if it is received while the draft GSP is being developed!

GSP Process does not end in 2023!

GSP will be refined and update every 5 yrs. or more frequently, as warranted.

GSP DEVELOPMENT SCHEDULE (SEE WEBSITE FOR PERIODIC UPDATES)

Activity	Start	End	Days
Grant Agreement Administration	**1/1/2021**	**12/31/2023**	**1,094**
Quarterly Reports	1/1/2021	12/31/2023	1,094
Grant Completion Report	1/1/2021	12/31/2023	1,094
Groundwater Sustainability Plan (GSP)	**10/7/2021**	**4/30/2023**	**570**
Stakeholder Engagement / Outreach			
Develop Outreach Plan and Perform Initial Outreach	4/1/2022	6/30/2022	90
Workshop No. 1 (Basin setting and water budget)	8/4/2022	8/4/2022	-
Workshop No. 2 (Sust. Mgmt. Criteria & Projects/Mgmt. Actions)	10/24/2022	10/24/2022	-
Workshop No. 3 (Draft GSP)	Jan 2023	Jan 2023	-
GSP Preparation [1, 2]			
Hydrogeologic Conceptual Model[3]	10/7/2021	8/31/2022	328
Preliminary Water Budget	10/7/2021	3/31/2022	175
Numerical Model and Final Water Budget[3]	3/1/2022	9/30/2022	213
Groundwater Conditions[3]	4/1/2022	8/31/2022	152
Monitoring Networks[3]	5/17/2022	9/30/2022	136
Sustainable Management Criteria[3]	7/1/2022	9/30/2022	91
Projects and Management Actions[3]	7/1/2022	9/30/2022	91
Finalize Draft GSP Sections and Compile GSP	7/1/2022	11/21/2022	143
Draft GSP	11/21/2022	11/21/2022	-
GSP Reviews and Adoption			
Board Meeting - Approve Draft GSP for Public Comment	12/7/2022	12/7/2022	-
90-day Notices to Cities and County	1/5/2023	1/5/2023	-
Draft GSP Public Comment Period	12/15/2022	1/31/2023	47
Respond to Comments and Prepare Tentative Final GSP	2/1/2023	3/16/2023	43
Tentative Final GSP	3/16/2023	3/16/2023	-
Public Hearing - Adopt GSP	4/5/2023	4/5/2023	-
Upload GSP to DWR SGMA Portal	4/5/2023	4/30/2023	29

Questions?

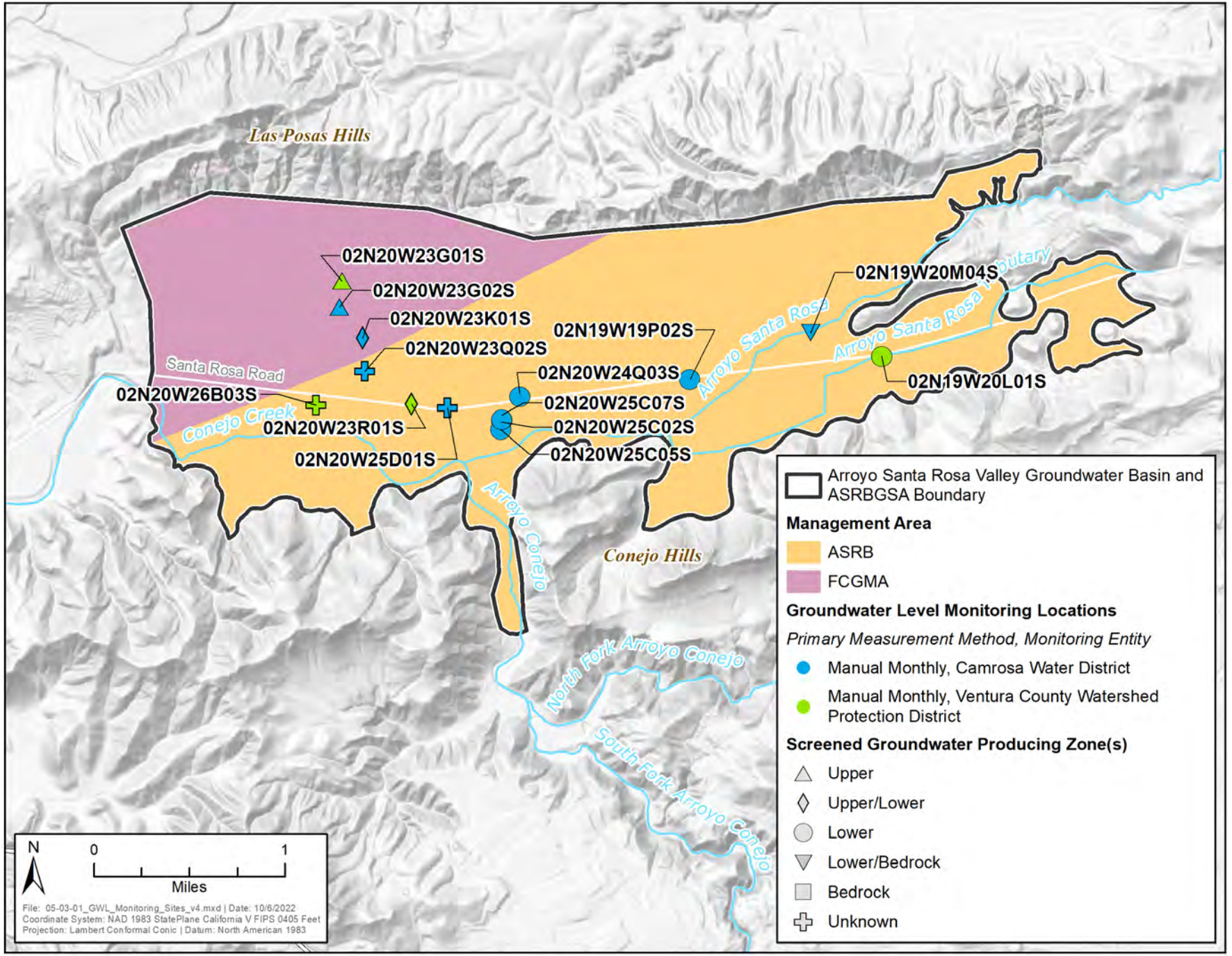
MONITORING NETWORKS

&

SUSTAINABLE MANAGEMENT CRITERIA

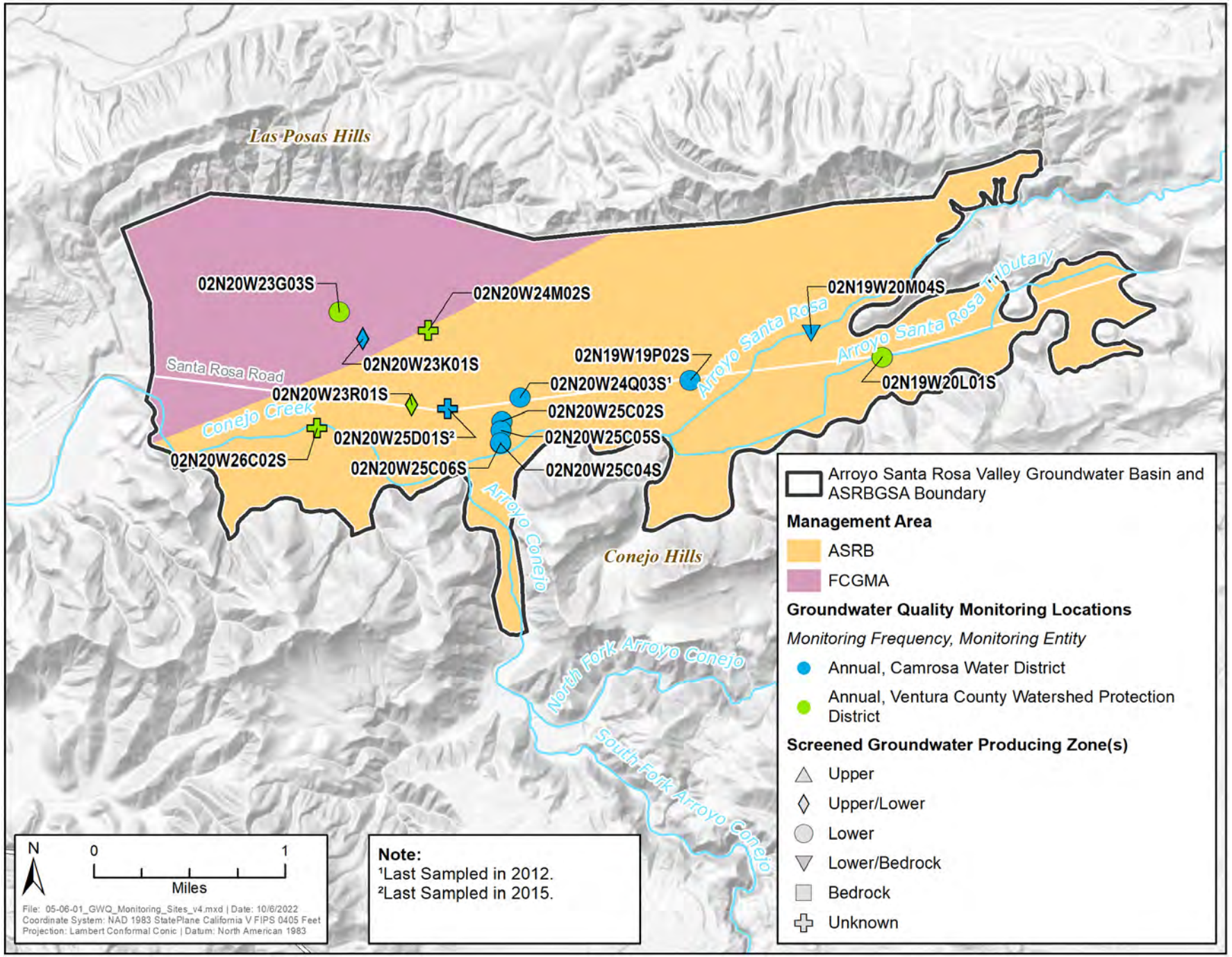
MONITORING NETWORKS

- SMC are defined at monitoring network locations where the GSAs can measure conditions:
  - Groundwater Levels
  - Groundwater Quality
  - Surface Water Flow



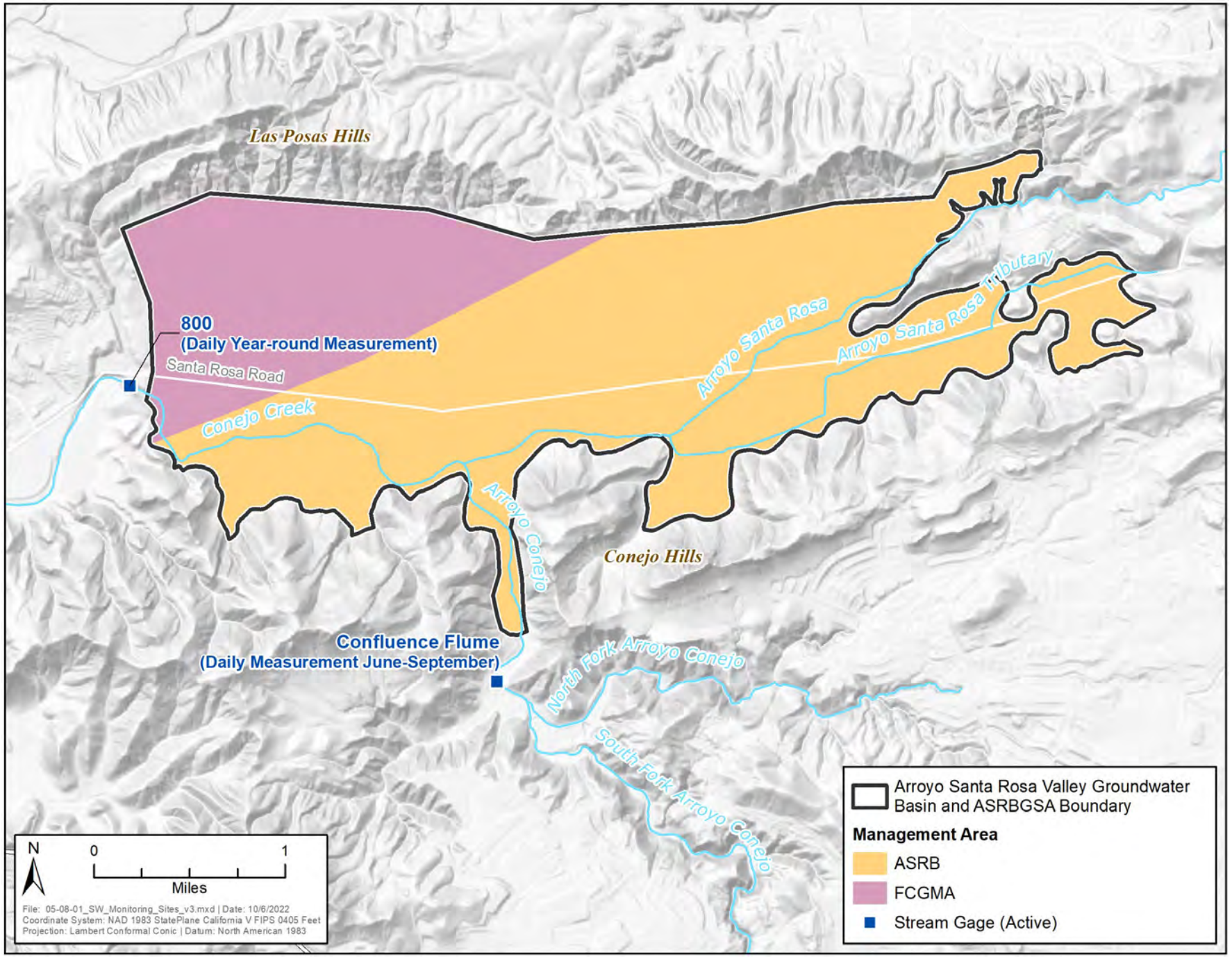
GROUNDWATER LEVEL MONITORING NETWORK

- 14 Locations:
  - FCGMA Area: 3
  - ASRBGSA Area: 11
- Monitoring Entities:
  - VCWDP: 3
  - Camrosa WD: 11
- Monitoring Frequency:
  - VCWDP: Quarterly
  - Camrosa WD: Monthly



GROUNDWATER QUALITY MONITORING NETWORK

- 14 Locations:
  - FCGMA Area: 2
  - ASRBGSA Area: 12
- Monitoring Entities:
  - VCWDP: 5
  - Camrosa WD: 9
- Monitoring Frequency:
  - Annual, some monthly

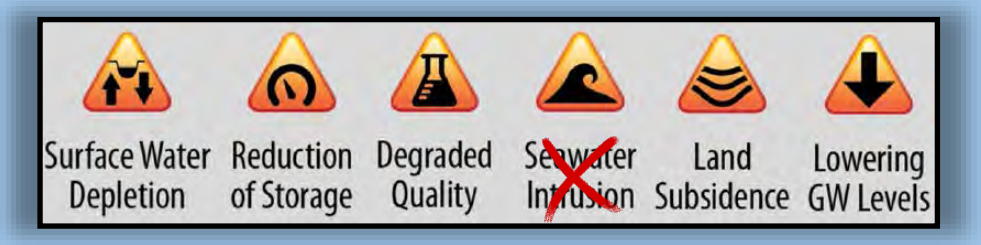


SURFACE WATER FLOW MONITORING NETWORK

- Arroyo Conejo & Conejo Creek are perennial
  - 2 Locations:
    - Gage 800 (TMDL Parties)
      - Year Round
    - Confluence Flume (City of TO)
      - Dry season only
- Arroyo Santa Rosa and its tributary only flow following storms - one storm event gage (not shown)

Sustainable Management Criteria

- Sustainability Goal
- Sustainability Indicators



  - Undesirable Results
    - Significant and unreasonable effects *occurring throughout the basin* related to any of the six sustainability indicators
  - Minimum Thresholds
    - Quantitative metrics indicating undesirable results exist *in a particular area*
  - Measureable Objectives
    - Quantitative metrics that reflect basin desired conditions in a particular area

Sustainability Goal

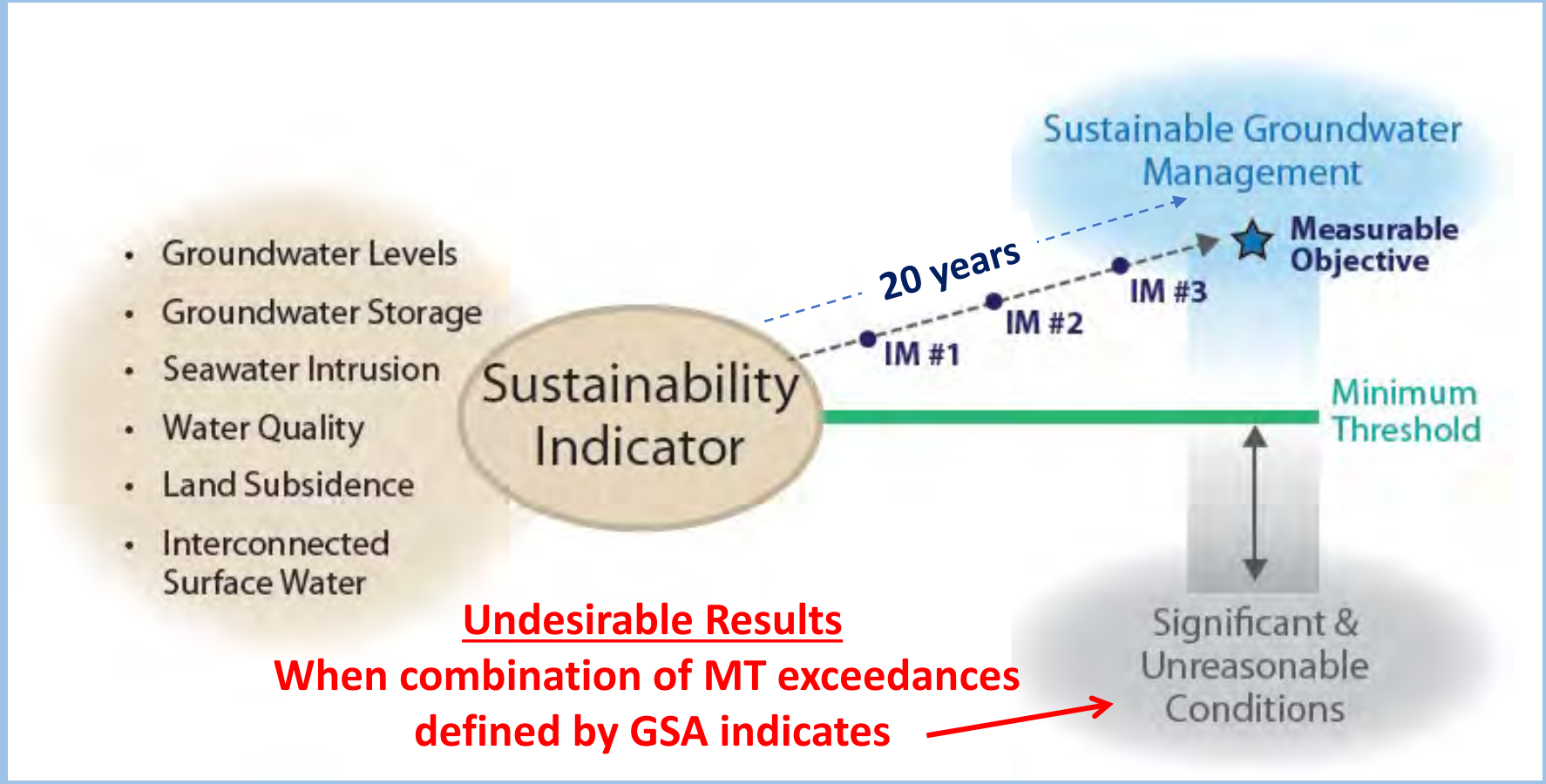
- High-level policy framework to guide development of Sustainable Management Criteria & Plan Actions
- Draft Sustainability Goal:

…to maintain sustainable conditions in the ASRVGB thereby supporting beneficial use and users of groundwater in the ASRVGB, without causing undesirable conditions under future conditions. The GSA also desires to collaborate with other agencies and stakeholders within the basin to improve the groundwater quality of the ASRVGB.

Defining Undesirable Results is a Critical Step in GSP Development

- Qualitatively, its the effects that GSA wants to avoid:
  - Based on potential effects on the beneficial uses and users of groundwater, on land uses and property interests.
  - Not all effects are necessarily unreasonable.
- Quantitatively, URs are the combination of minimum threshold exceedance deemed to indicate URs are occurring.
- URs determined locally by GSA in consultation with stakeholders and public input.

Relationship Between MT/MO, Undesirable Results, and Sustainable Management



MT/MO Metrics

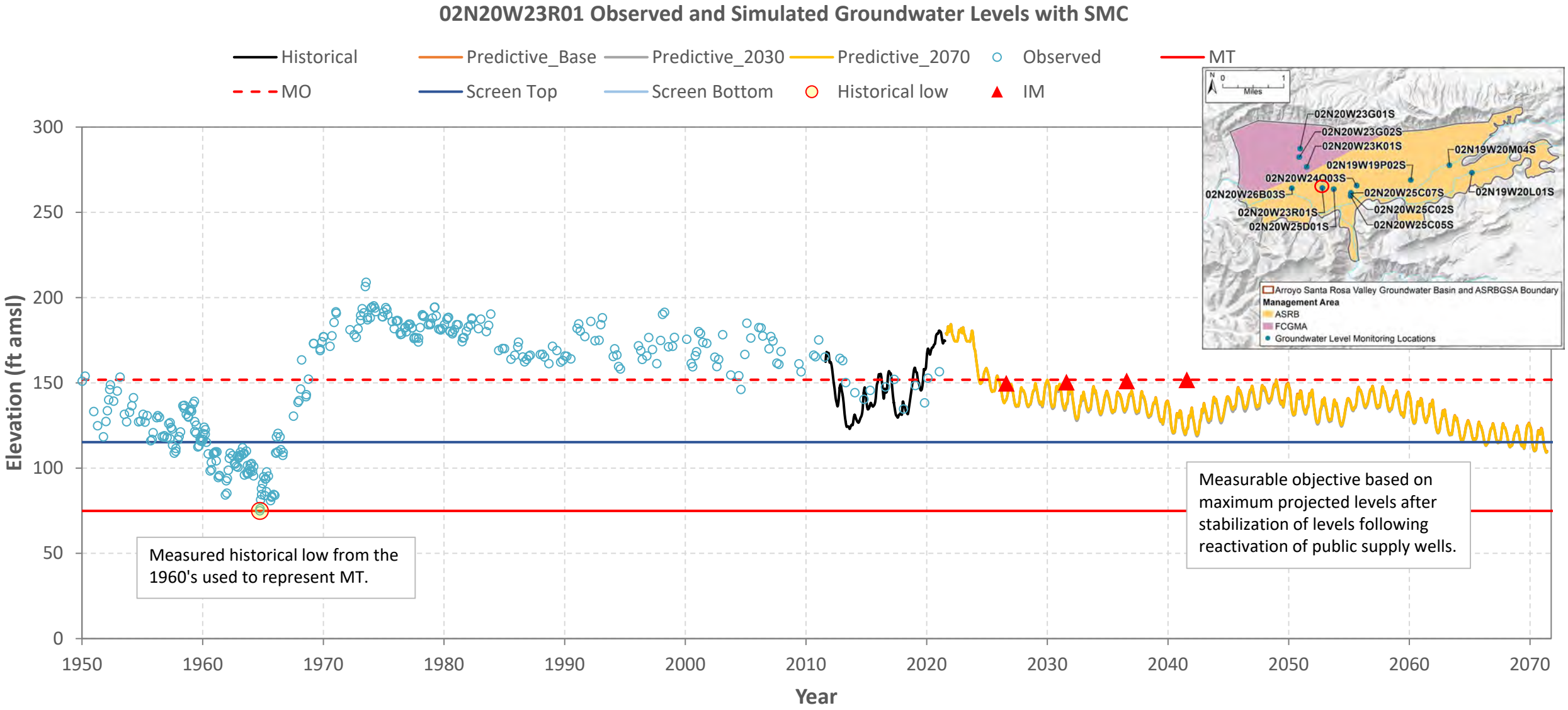
Sustainability Indicators	Lowering GW Levels	Reduction of Storage	Seawater Intrusion	Degraded Quality	Land Subsidence	Surface Water Depletion
Metric(s) Defined in GSP Regulations	• Groundwater Elevation	• Total Volume *	• Chloride concentration isocontour *	• Migration of Plumes • Number of supply wells • Volume • Location of isocontour *	• Rate and Extent of Land Subsidence *	• Volume or rate of surface water depletion *

Groundwater elevation may be used as a proxy.

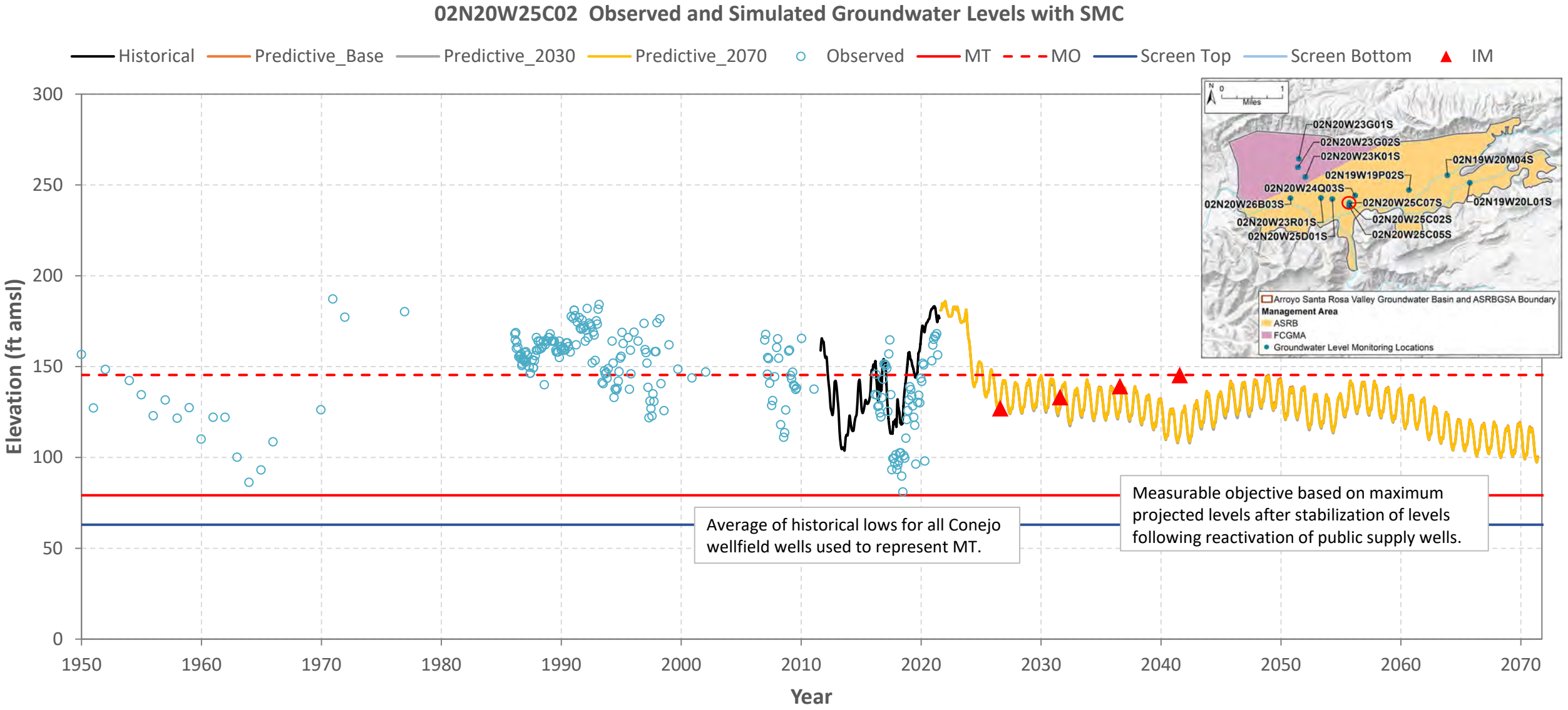
Chronic Lowering of Groundwater Levels

- Undesirable Results:
  - Qualitative: Prevent "depletion of supply" for M&I, Agriculture and Domestic Uses (no GDEs in the basin) wells in the basin
  - Quantitative: MTs exceeded in >50% of monitoring wells in either management areas for 2 consecutive years
- Minimum Threshold is set to historical low groundwater elevations (observed or estimated)
- Measurable Objective is set to projected maximum modeled groundwater elevation after Camrosa WD Conejo wellfield resumes regular operations
- Interim Milestones are a linear progression towards MO

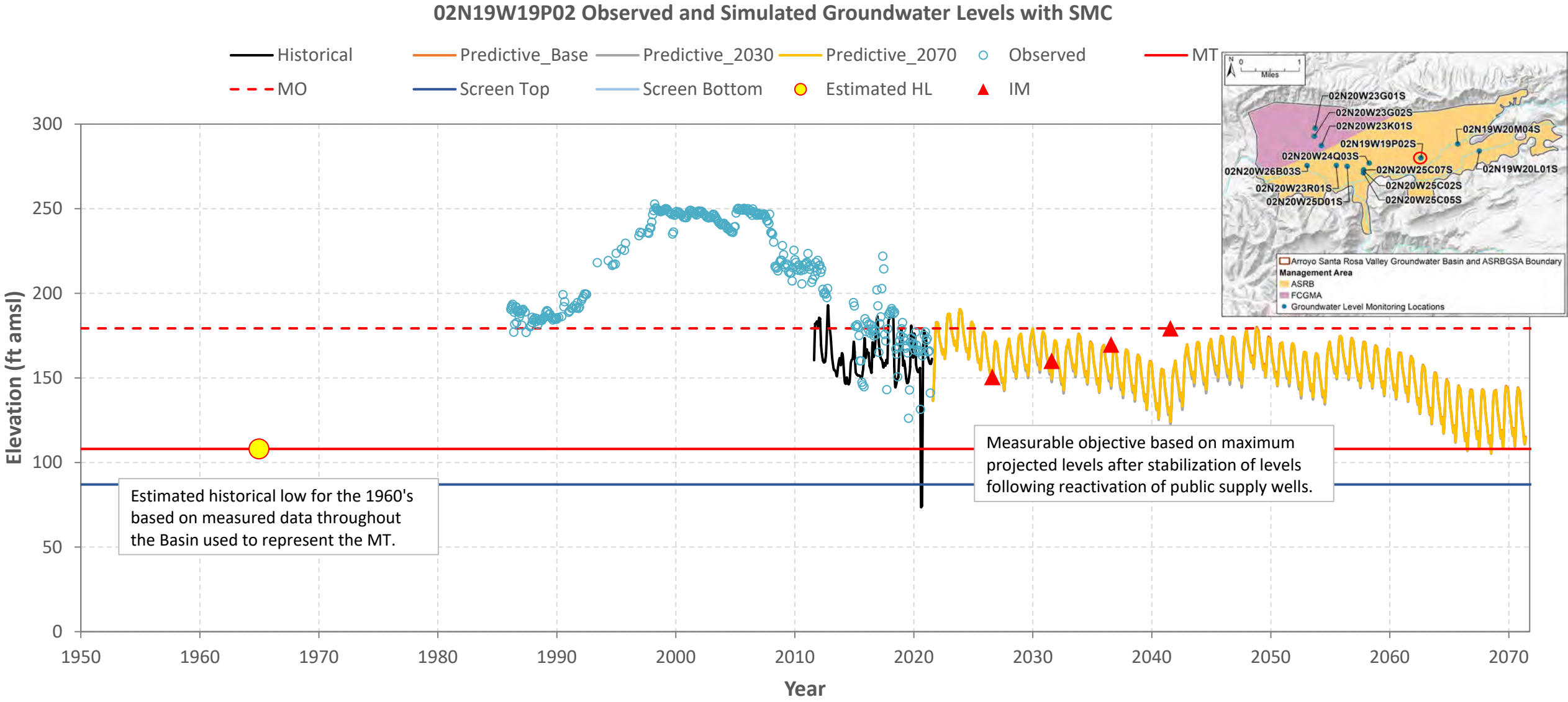
Example Hydrograph in ASR Management Area



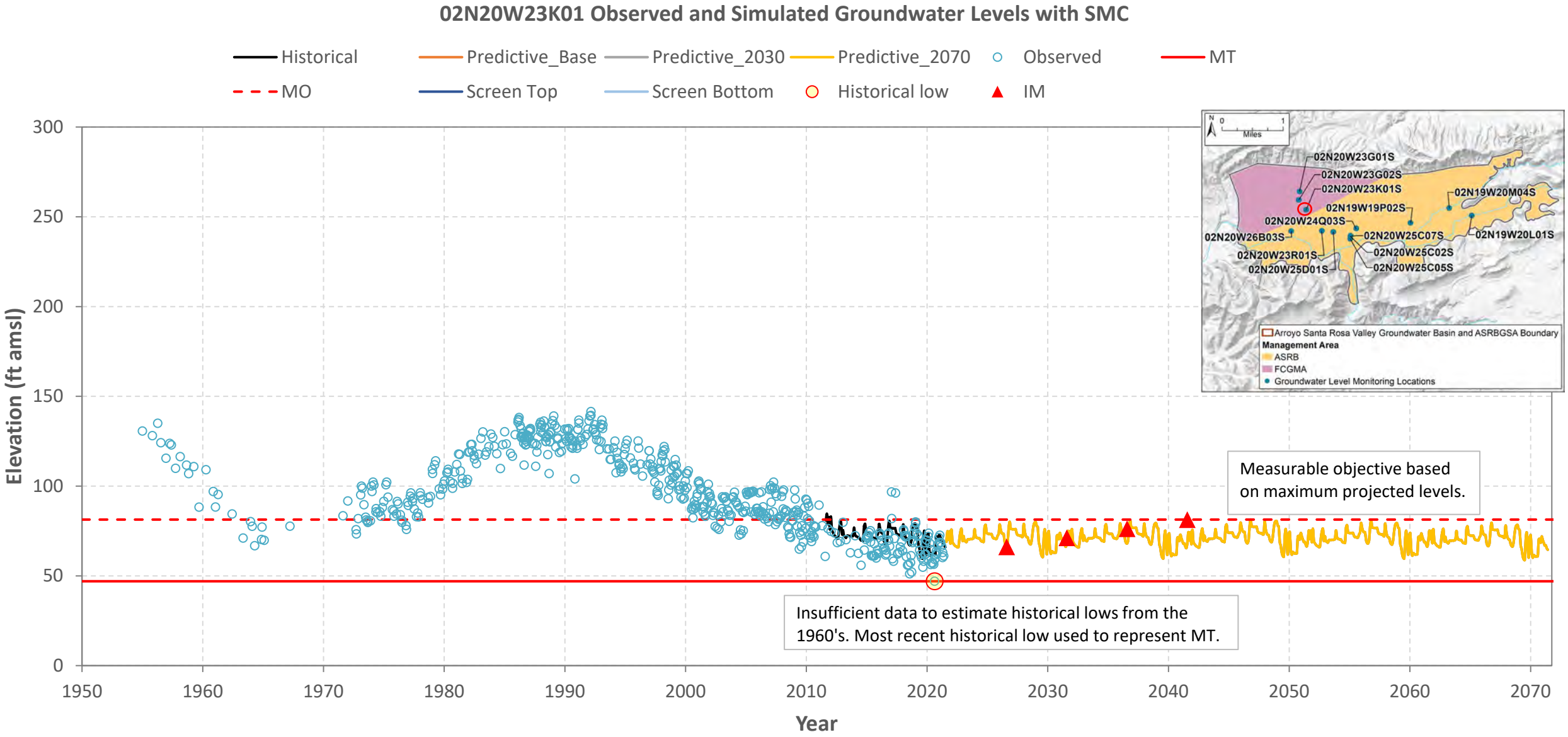
Example Hydrograph in ASR Management Area



Example Hydrograph in ASR Management Area



Example Hydrograph in GMA Management Area



Reduction of Groundwater Storage

- Groundwater levels and storage are directly related

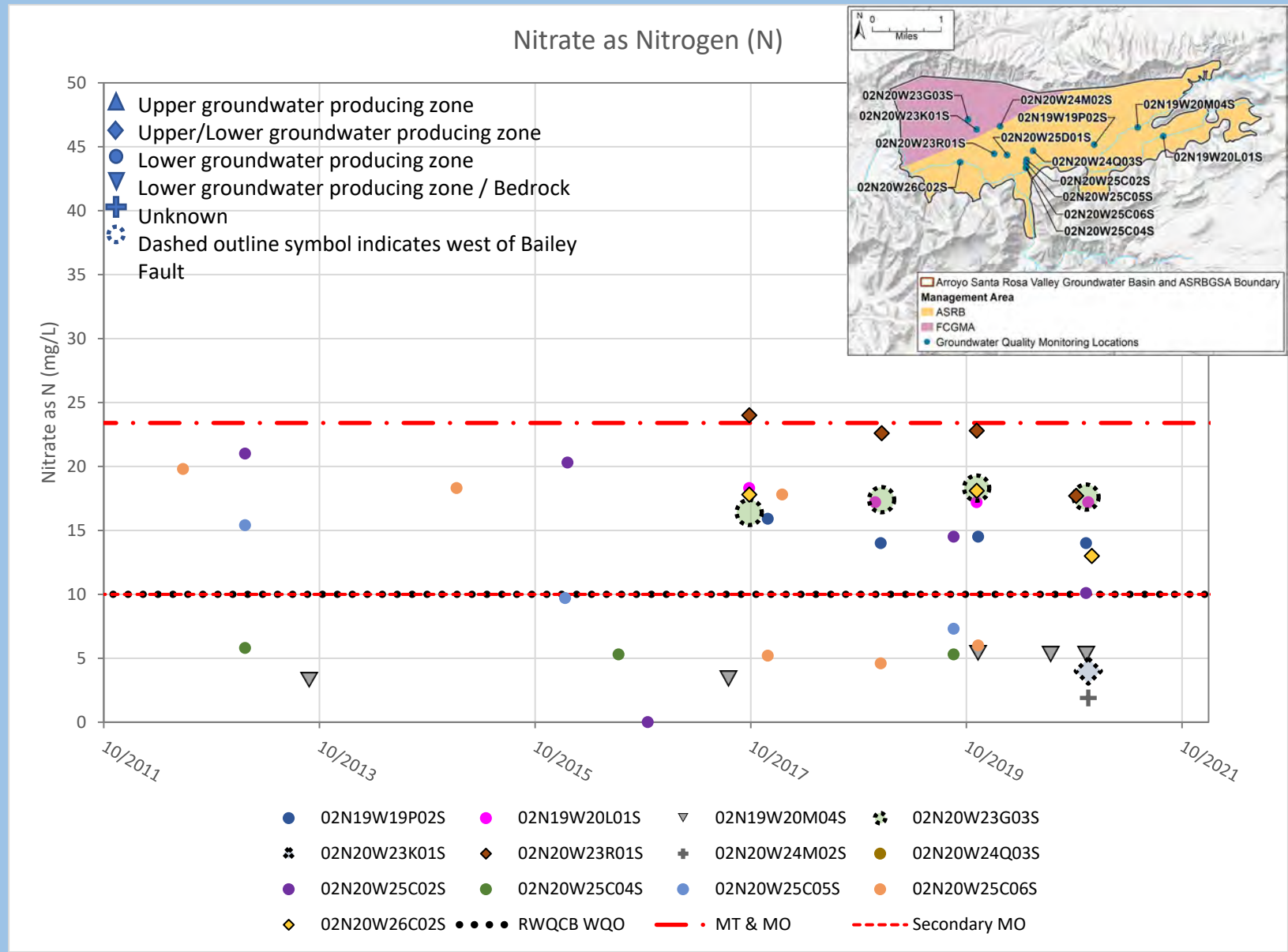
- SMC for Chronic Lower of Groundwater Levels sustainability indicator will be used as a proxy for the Reduction of Groundwater Storage sustainability indicator.

Degradation of Water Quality

- Groundwater quality in the Basin is not ideal, but is not caused by groundwater pumping
- SGMA only requires GSAs to address groundwater quality degradation that is caused by groundwater pumping or GSP projects.
- If proposed SMC are not met, the SMC will be deemed to be applicable only if the GSA determines groundwater pumping and/or GSP project(s) were the causal factor.
- SMCs include a “Secondary” Measurable Objective set as an aspirational goal to improve water quality for the Basin to enhance grant eligibility.

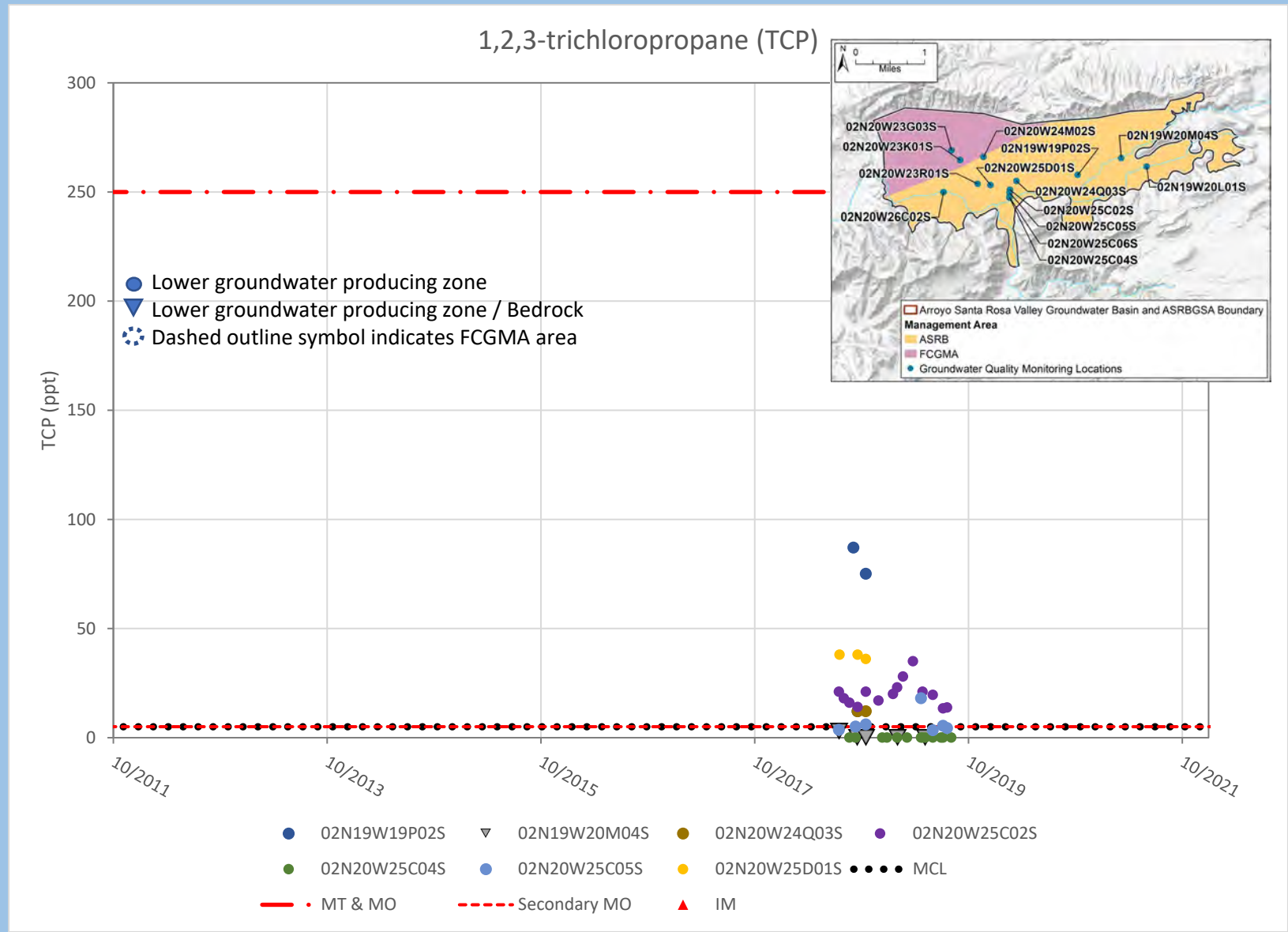
Nitrate SMC

- Undesirable Results
  - Qualitative: WQ that makes blending economically infeasible.
  - Quantitative: Average concentration in either management area exceeds MT more than two years and caused by pumping or GSP
- MT and MO set at the blending infeasibility concentration.
- Secondary MO = MCL



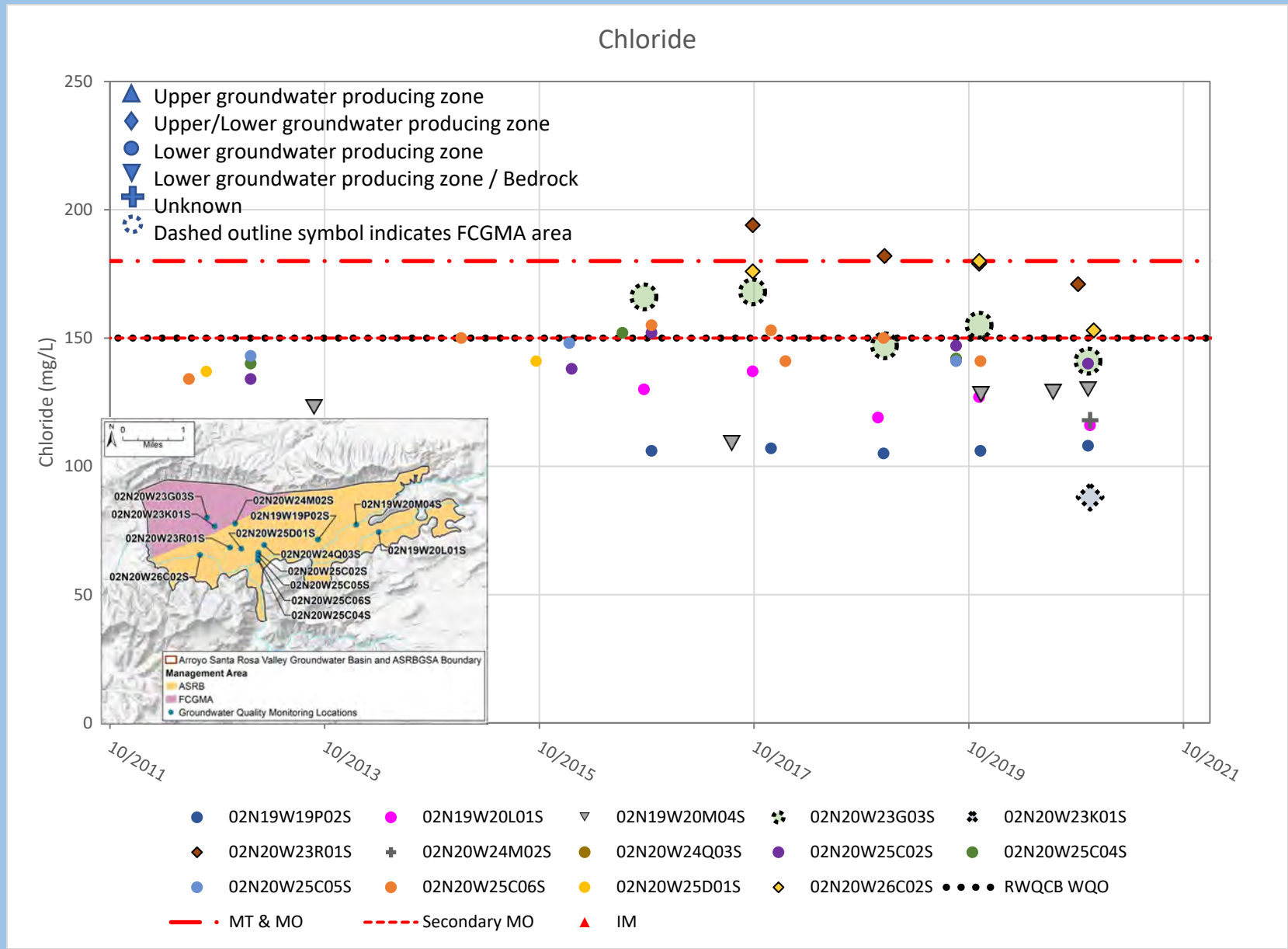
TCP SMC

- Undesirable Results
  - Qualitative: WQ that makes treatment economically infeasible.
  - Quantitative: Average concentration in either management area exceeds MT more than two years and caused by pumping or GSP
- MT and MO set at the treatment infeasibility concentration.
- Secondary MO = MCL



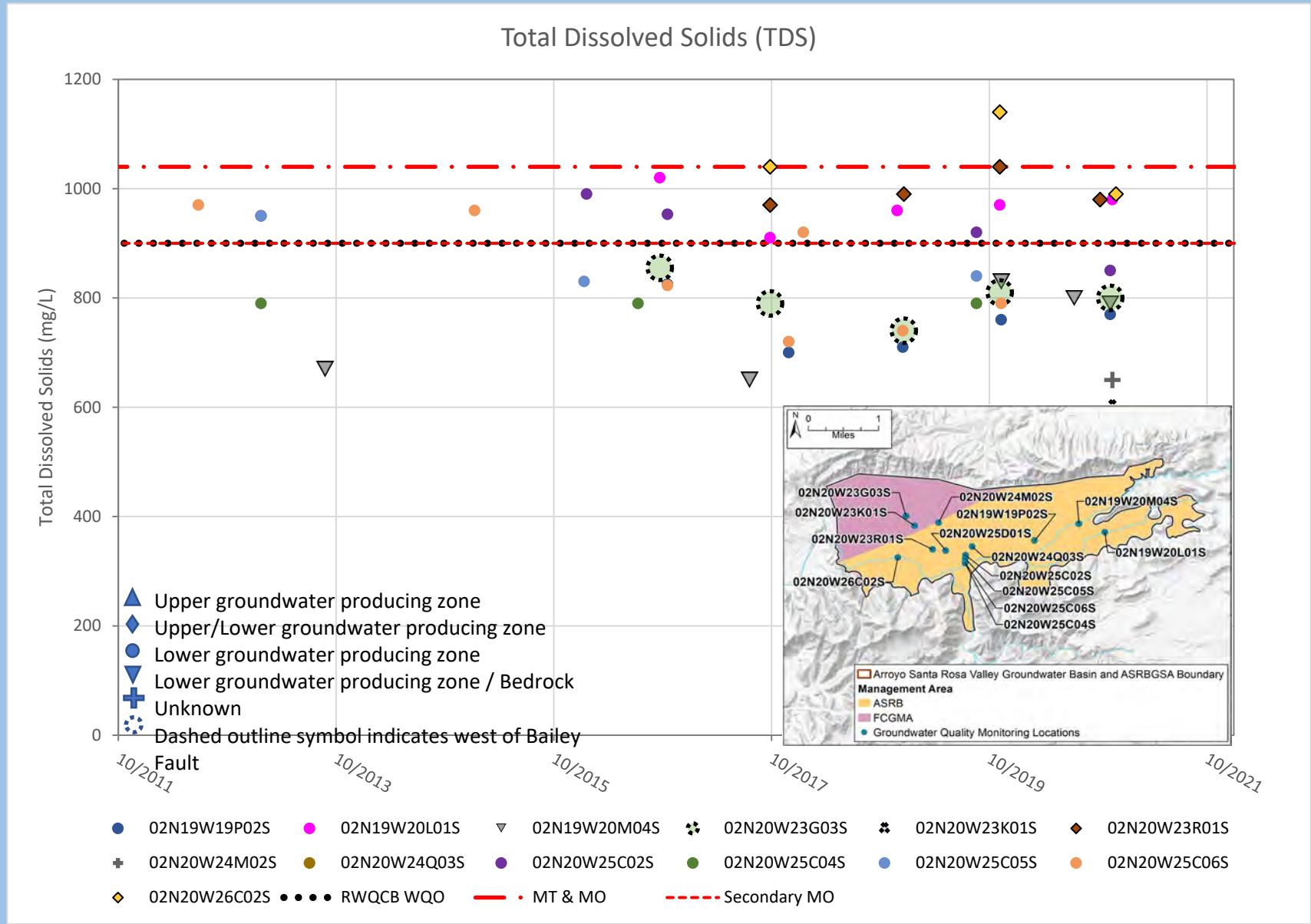
Chloride SMC

- Undesirable Results
  - Qualitative: Further degradation of WQ that increases demand for blending water.
  - Quantitative: Average concentration in either management area exceeds MT more than two years and caused by pumping or GSP
- MT and MO set at an upper range of concentrations during past 10 years.
- Secondary MO = WQO



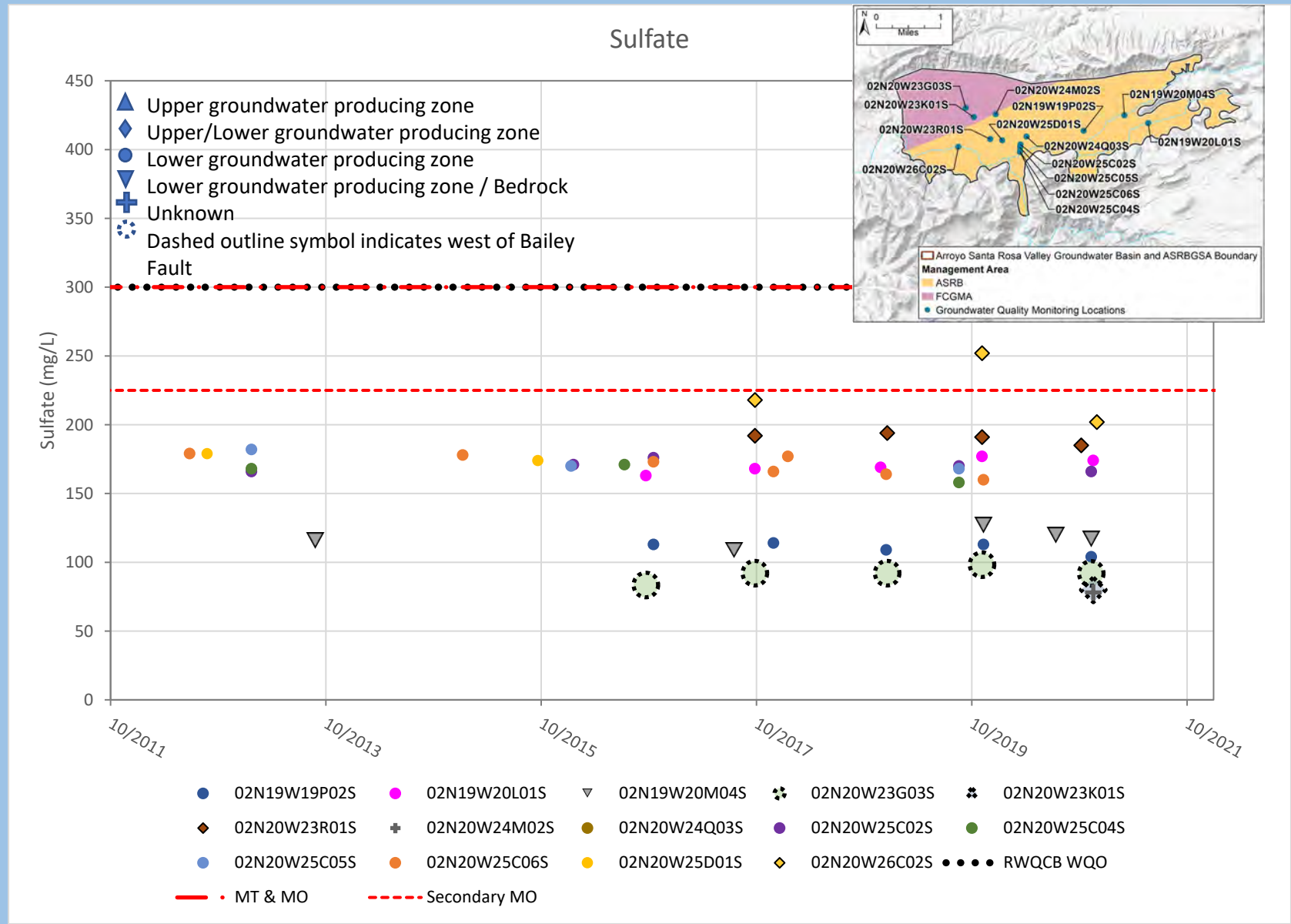
TDS SMC

- Undesirable Results
  - Qualitative: Further degradation of WQ that increases demand for blending water.
  - Quantitative: Average concentration in either management area exceeds MT more than two years and caused by pumping or GSP
- MT and MO set at an upper range of concentrations during past 10 years.
- Secondary MO = WQO



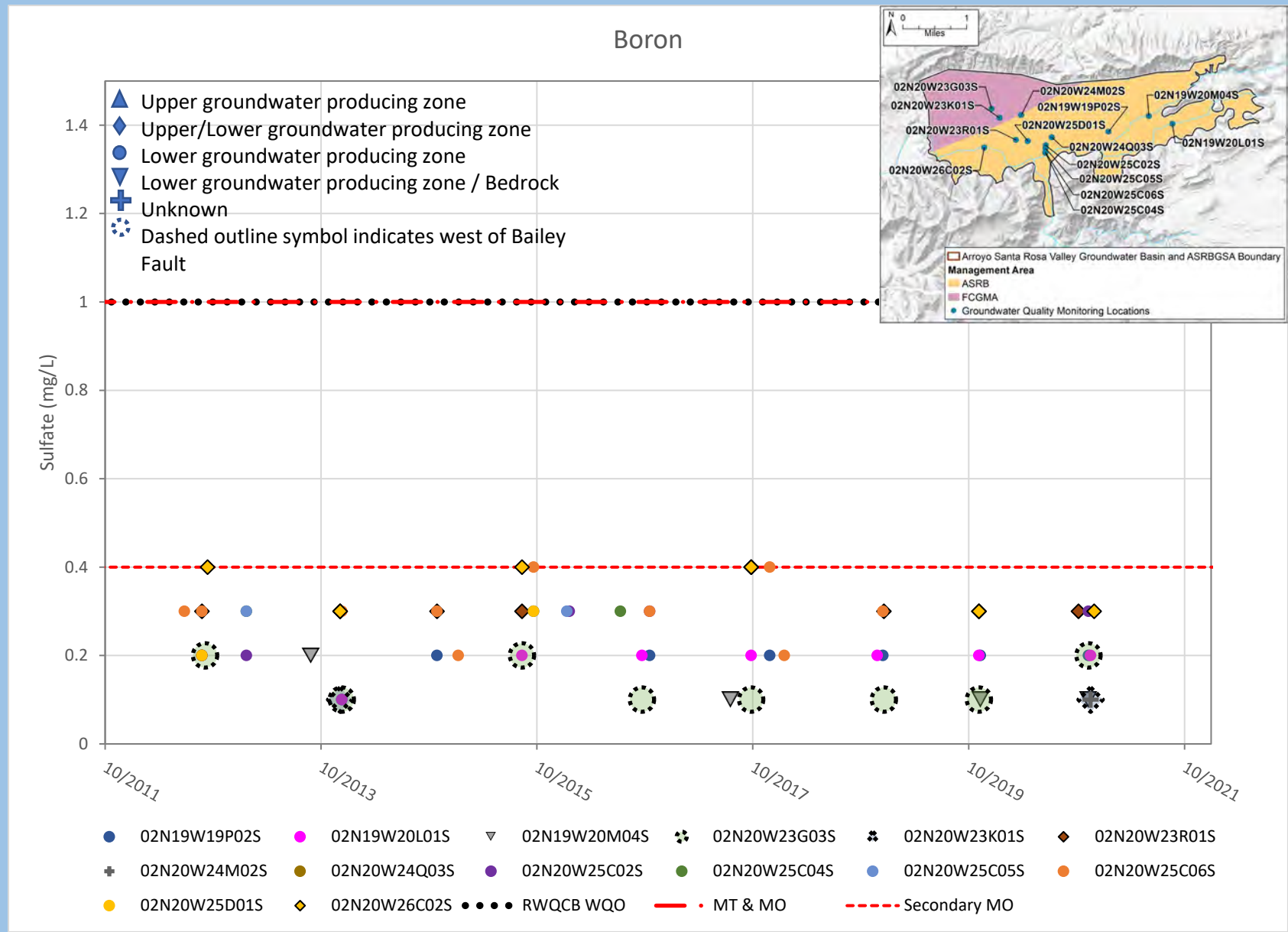
Sulfate SMC

- Undesirable Results
  - Qualitative: Further degradation of WQ.
  - Quantitative: Average concentration in either management area exceeds MT more than two years and caused by pumping or GSP
- MT and MO set at WQO.
- Secondary MO set at an upper range of concentrations during past 10 years



Boron SMC

- Undesirable Results
  - Qualitative: Further degradation of WQ.
  - Quantitative: Average concentration in either management area exceeds MT more than two years and caused by pumping or GSP
- MT and MO set at WQO.
- Secondary MO set at an upper range of concentrations during past 10 years



Degradation of Water Quality SMC

Constituent	MCL (mg/L)	Sec. MCL (R/U/ST)[1] (mg/L)	RWQCB WQO (mg/L)	Average Conc. Representative Monitoring Wells Last 10 Years (mg/l)	Minimum Threshold[2] (mg/L)	Minimum Threshold Rationale	Measure Objective[3] (mg/L)	Secondary MO[4] (mg/L)	Measurable Objective Rationale
Nitrate	10	N/A	10	13.1	23.4	Preserve ability to blend with imported water for potable uses. Reduce reliance on imported water for blending.	23.4	10	Preserve ability to blend with imported water for potable uses. Reduce reliance on imported water for blending.
TCP	5 (ng/L)	N/A	N/A	13 (ng/L)	250 (ng/L)	Practical limit of concentration for economical carbon change-out frequency of the GAC system.	250 (ng/L)	5 (ng/L)	Practical limit of concentration for economical carbon change-out frequency of the GAC system.
TDS	N/A	500/1,000/1,500	900	858	1,040	Preserve existing water quality for agricultural, municipal, and industrial beneficial uses	1,040	900	Preserve existing water quality for agricultural, municipal, and industrial beneficial uses.
Sulfate	N/A	250/500/600	300	152	300	Preserve existing water quality for municipal beneficial use.	300	225	Preserve existing water quality for municipal beneficial use.
Chloride	N/A	250/500/600	150	141	180	Preserve existing water quality for agricultural beneficial use. MO is selected to preserve existing water quality.	180	150	Preserve existing water quality for agricultural beneficial use. MO is selected to preserve existing water quality.
Boron	N/A	N/A	1	0.2	1	Preserve existing water quality for agricultural beneficial use. MO is selected to preserve existing water quality.	1.0	0.4	Preserve existing water quality for agricultural beneficial use. MO is selected to preserve existing water quality.

Notes:

1 Consumer Acceptance Levels, where R = Recommended, U = Upper, and ST = Short Term.

2 Undesirable results are considered to occur when all representative monitoring wells in a principal aquifer exceed the minimum threshold concentration for a constituent for two consecutive years.

3 Sustainability Goal for degraded water quality for a given constituent is considered to be met when the two-year running average concentration for at least one representative monitoring well is below the measurable objective.

4 Secondary MO set as an aspirational goal for the Basin for the purpose of improving overall conditions in the Basin per 354.30(g).

MCL = Maximum Concentration Limit

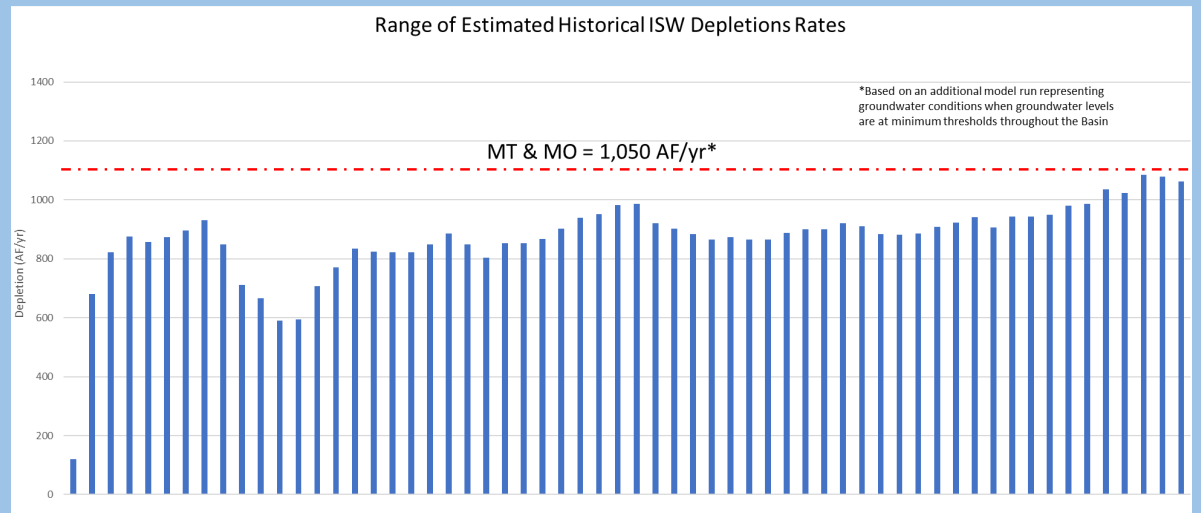
mg/L = milligrams per liter

Land Subsidence

- Historical data do not indicate that land subsidence is an issue.
- Inelastic (irreversible) land subsidence is generally believed to not occur unless groundwater levels decline below the lowest historical level.
- Since the SMCs for chronic lowering of groundwater levels are based on historical low levels, they can be used as a proxy for land subsidence SMC.
- InSAR satellite data will also be reviewed annually.

Depletion of Interconnected Surface Water

- Undesirable Results:
  - Qualitative: Significant and unreasonable impact to diversions and surface water dependent riparian vegetation
  - Quantitative: Same as MTs exceedance because only one MT
- Minimum Threshold is set based on the estimated maximum depletion (estimated using numerical model)
- Measurable Objective is same as MT because not much variability in depletion rates year to year



Questions?

PROJECTS AND MANAGEMENT ACTIONS

Projects and Management Actions

- Projects and/or management actions:
  - If necessary to achieve sustainable management
  - If desired to increase basin yield or improve water quality

Projects and Management Actions

- 5 projects proposed.
  - 1 required by SGMA
  - 4 included to meet sustainability goal to improve water quality

- Proposed projects to improve basin understanding and to improve water quality.

Project No. 1: Groundwater Monitoring Network Enhancement Project

- Survey monitoring wells (SGMA req.)
- Determine construction of monitoring wells where unknown (SGMA req.)
- Research existing wells in areas of limited coverage for potential addition to monitoring networks
- Pursue access agreements and add wells to monitoring network, as possible.

Project No. 2: Water Quality Management Coordination

- Coordinate and support others' efforts to manage groundwater quality in the Basin:
  - Camrosa Water District
  - Ventura County land use planning and permitting re: horse manure management
  - MS4
  - TMDLs
  - Agricultural Waiver

Project No. 3: Santa Rosa Basin Desalter Project

- Contributes to sustainability goal by:
  - Removing salts and nitrate from the basin
  - Improving water quality at point of use
- Non-GSP benefits
  - Reduces dependency on imported water for blending
  - Helps stabilize water rates
- Limited information is available, so GSP will describe this project at a very high level

Project No. 4: Santa Rosa Basin Recharge Project

- Recharge the Basin with non-potable surface water and/or recycled water near Conejo Wellfield and/or other locations
- Two limited studies of area near Conejo Wellfield indicate basin yield could potentially be increased by ~1,000 AFY
- Limited information is available, so GSP will describe this project at a very high level

Project No. 5: Conejo Creek Recharge Enhancement

- Construct extraction wells and pump near Conejo Creek to induce additional surface water recharge
- No studies of this project to date.
- Limited information is available, so GSP will describe this project at a very high level

Questions?

STAKEHOLDER Q&A
&
FEEDBACK

ATTENDEE POLL NOS. 5 & 6

STAKEHOLDER ENGAGEMENT IS ENCOURAGED

- Track status at: www.asrgsa.com
- Join the ASRBGSA Interested Parties List by contacting IanP@camrosa.com.
- Email inquiries to: IanP@camrosa.com

EXECUTIVE DIRECTOR AND BOARD MEMBER COMMENTS

WRAP UP
THANK YOU FOR PARTICIPATING!