

Task Force Planning Priorities - Task 1: Prepare Updated Surface Water Monitoring Program for TDS/N for the Santa Ana River Reaches, 2, 3 ,4 and 5

Recommended Surface Water Monitoring Plan – Reach 3 TDS Compliance Metric and Special Studies for Reach 3 & 4

July 26, 2022



2022 Santa Ana River Water Quality Work Plan

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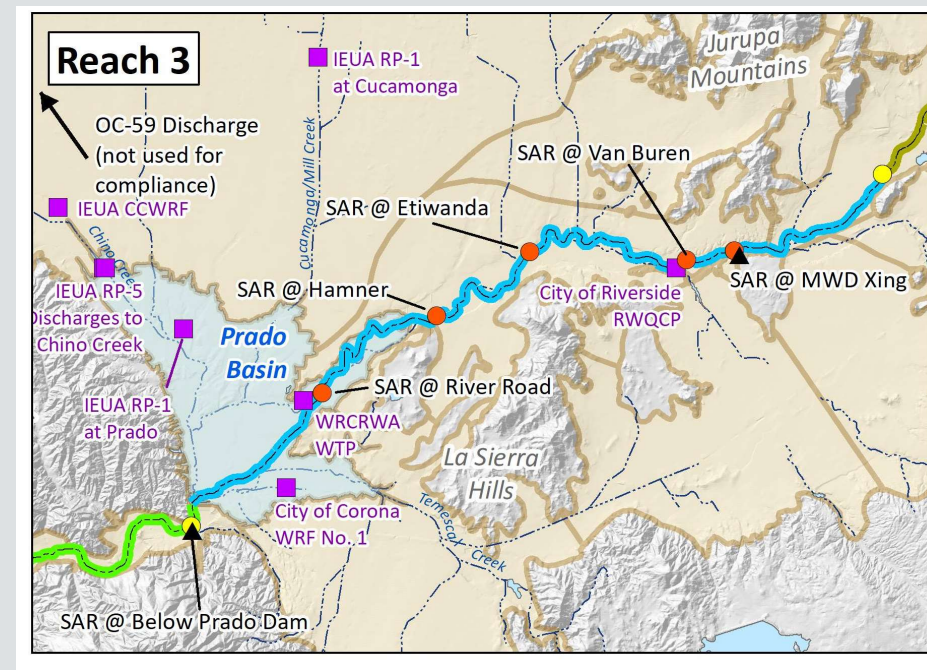
1. Background
2. Evaluation of the 2005-2020 Surface Water Monitoring Program
3. 2022 Surface Water Monitoring Program to Assess Compliance with Basin Plan TDS and Nitrogen Objectives
4. Recommendation for Special Studies

Reach 3 – Monitoring and Compliance

Recommendations for the 2022 Work Plan:

- Develop a clear definition of Reach 3 “base flow” conditions that enables use of more data*
- Use available precipitation data, USGS flow and ACOE reservoir levels at Prado Dam to assess base-flow conditions annually
- Use the available water quality data collected by USGS (daily calculated and grab samples) and OCWD during base flow conditions to assess compliance
- Eliminate Regional Board sampling requirement*
- Remove the requirement to collect filtered total nitrogen samples for compliance*

*Amend Basin Plan to Incorporate this into the SNMP Compliance Plan



Reach 3 – 2022 Work Plan

Site	Monitoring Performed	Monitoring Entity	Monitoring Frequency
USGS Gage at SAR @ Below Prado	Flow, EC	USGS	Daily
SAR @ Below Prado	Water quality: TDS and TIN	USGS	Bi-weekly
		OCWD	Monthly
Prado Basin	Water level elevation	ACOE	Quarterly

(This is called Option AB on subsequent slide)

Compliance Metric: Annual Average TDS and TIN of all samples collected during base flow conditions.

- For TDS, use daily TDS record constructed from relationship between daily EC measured by USGS and periodic grab samples.
- For TIN, use TIN data, not filtered total nitrogen

Proposed Definition of Base Flow Conditions in Reach 3:

“when there are no precipitation events and OC-59 discharge within the last four days, and the water-level elevation of the conservation pool behind Prado Dam is at or below the level that is considered empty.”

OCWD proposed:

- *Also excluding November – February which is the non-growing season for riparian vegetation in Prado Basin, and higher rising groundwater*
- *Looking into the use of the daily calculated TDS*

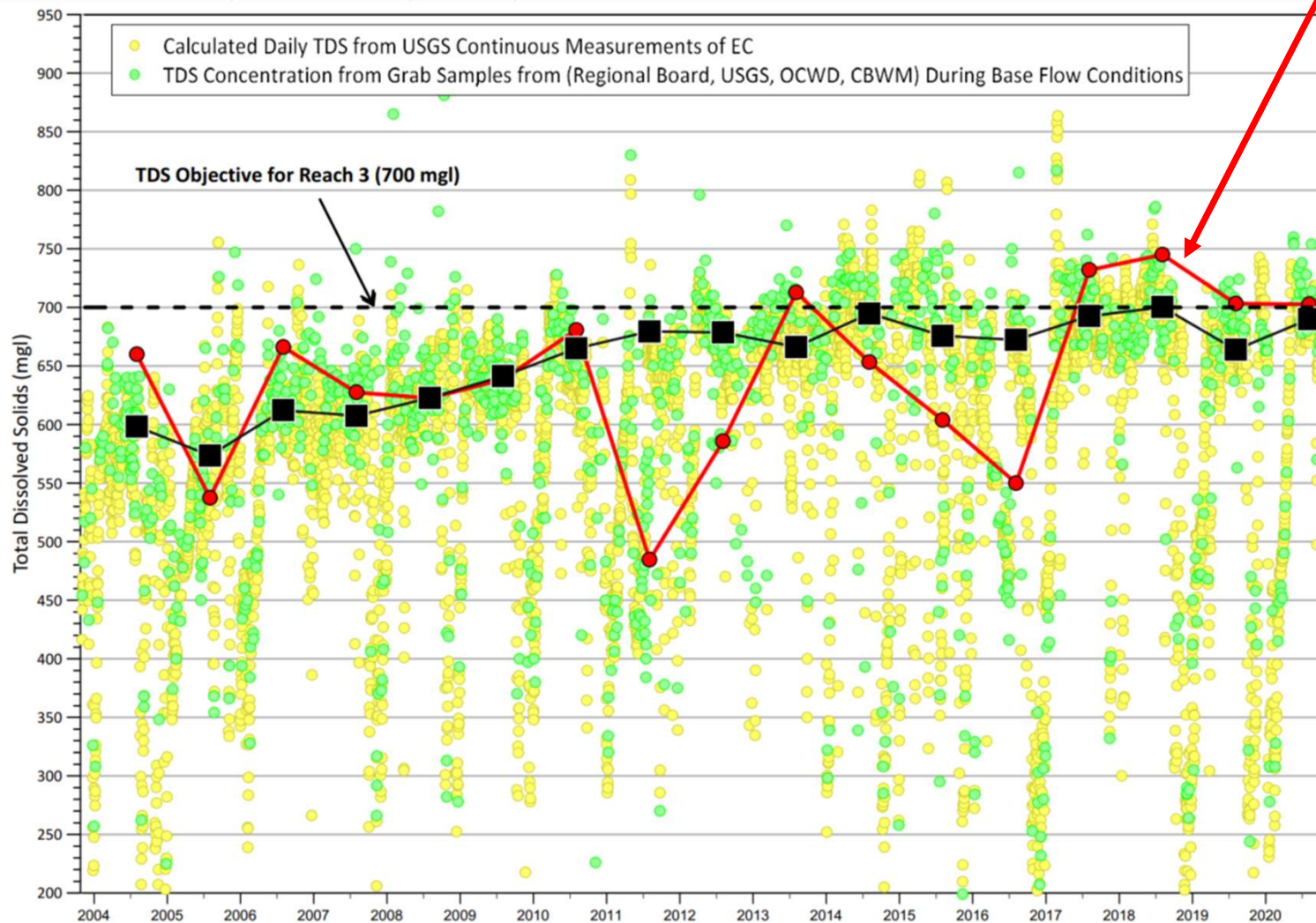
Reach 3 TDS Compliance Metric Options That Use data during Base Flow Conditions

Old Compliance Metric

Proposed New Compliance Metric Options: *

■ Option AB –TDS for Base Flow Conditions (Grab Samples and Calculated Daily)

* All Exclude the use of Regional Board Grab Samples



Reach 3 TDS Compliance Metric Options That Use data during Base Flow Conditions

Old Compliance Metric

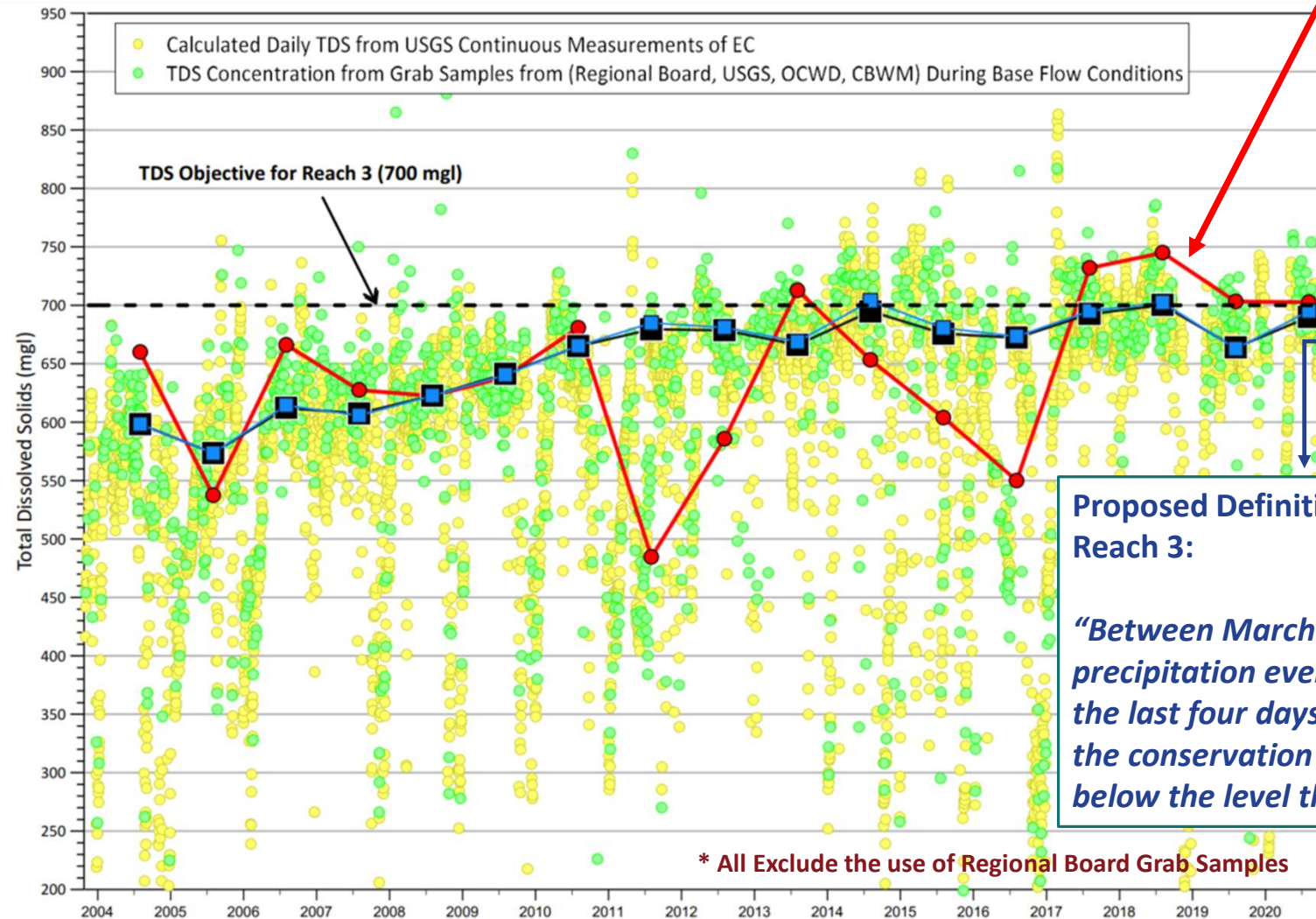
Proposed New Compliance Metric Options: *

- Option AB –TDS for Base Flow Conditions (Grab Samples and Calculated Daily)
- Option Xa –TDS for Base Flow Conditions Excluding Nov – Feb (Grab Samples and Calculated Daily)

Proposed Definition of Base Flow Conditions in Reach 3:

"Between March and October when there are no precipitation events and OC-59 discharge within the last four days, and the water-level elevation of the conservation pool behind Prado Dam is at or below the level that is considered empty."

* All Exclude the use of Regional Board Grab Samples



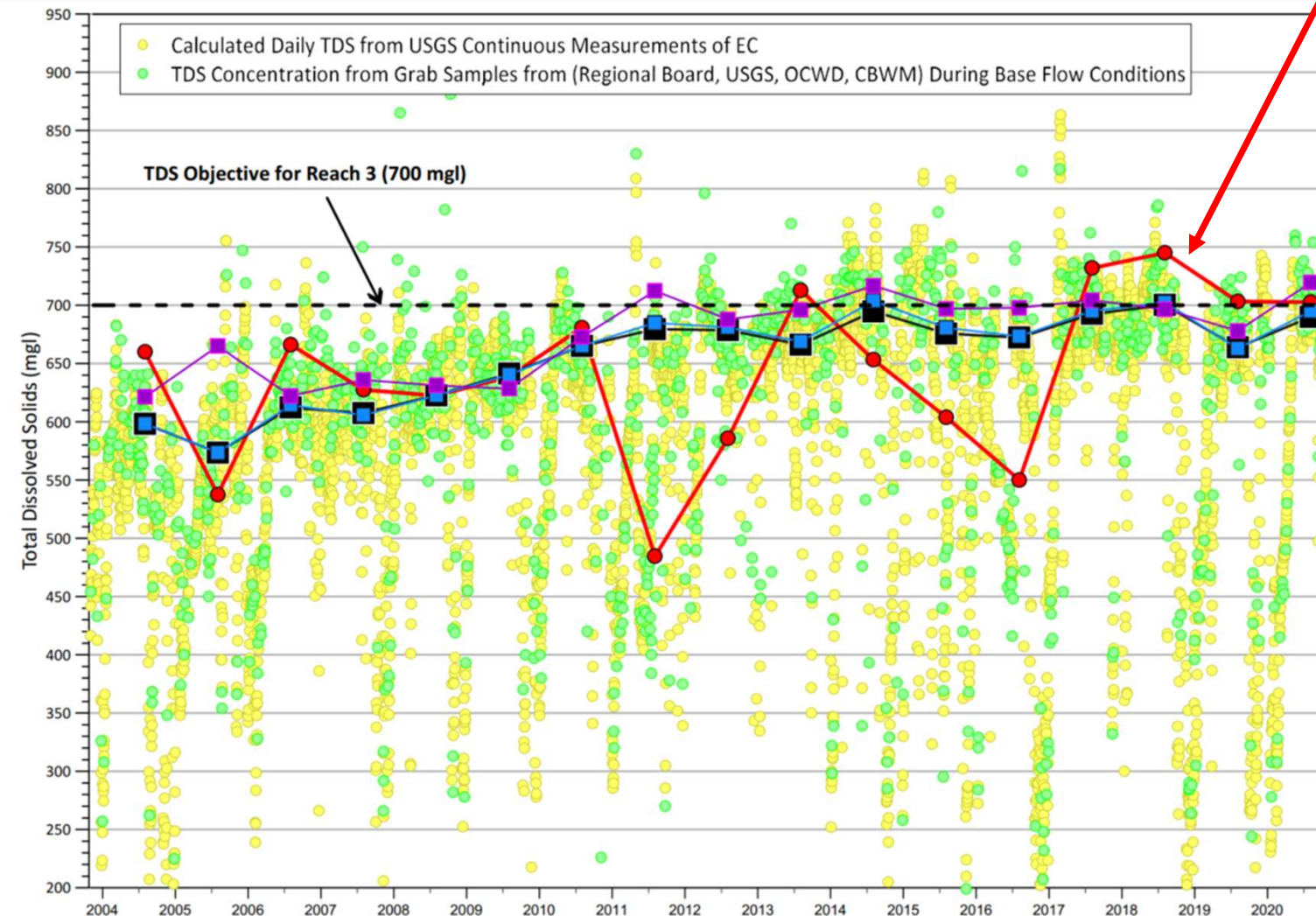
Reach 3 TDS Compliance Metric Options That Use data during Base Flow Conditions

Old Compliance Metric

Proposed New Compliance Metric Options: *

- Option AB –TDS for Base Flow Conditions (Grab Samples and Calculated Daily)
- Option Xa –TDS for Base Flow Conditions Excluding Nov – Feb (Grab Samples and Calculated Daily)
- Option Xb –TDS for Base Flow Conditions Exclusive of Nov– Feb (Grab Samples only; **no Calculated Daily**)

* All Exclude the use of Regional Board Grab Samples



What is left to Discuss to Finalize Sections 3?

- The use of the total filtered sample for compliance with the Reach 3 TIN objective
 - Its intended purpose ?
 - Continue to use or not for Reach 3?
 - Use for other reaches?

2022 Santa Ana River Water Quality Work Plan Outline

1. Background
2. Evaluation of the 2005-2020 Surface Water Monitoring Program
3. 2022 Surface Water Monitoring Program to assess compliance with Basin Plan TDS and Nitrogen objectives
4. Recommendation for Special Studies

Recommendation for Special Studies

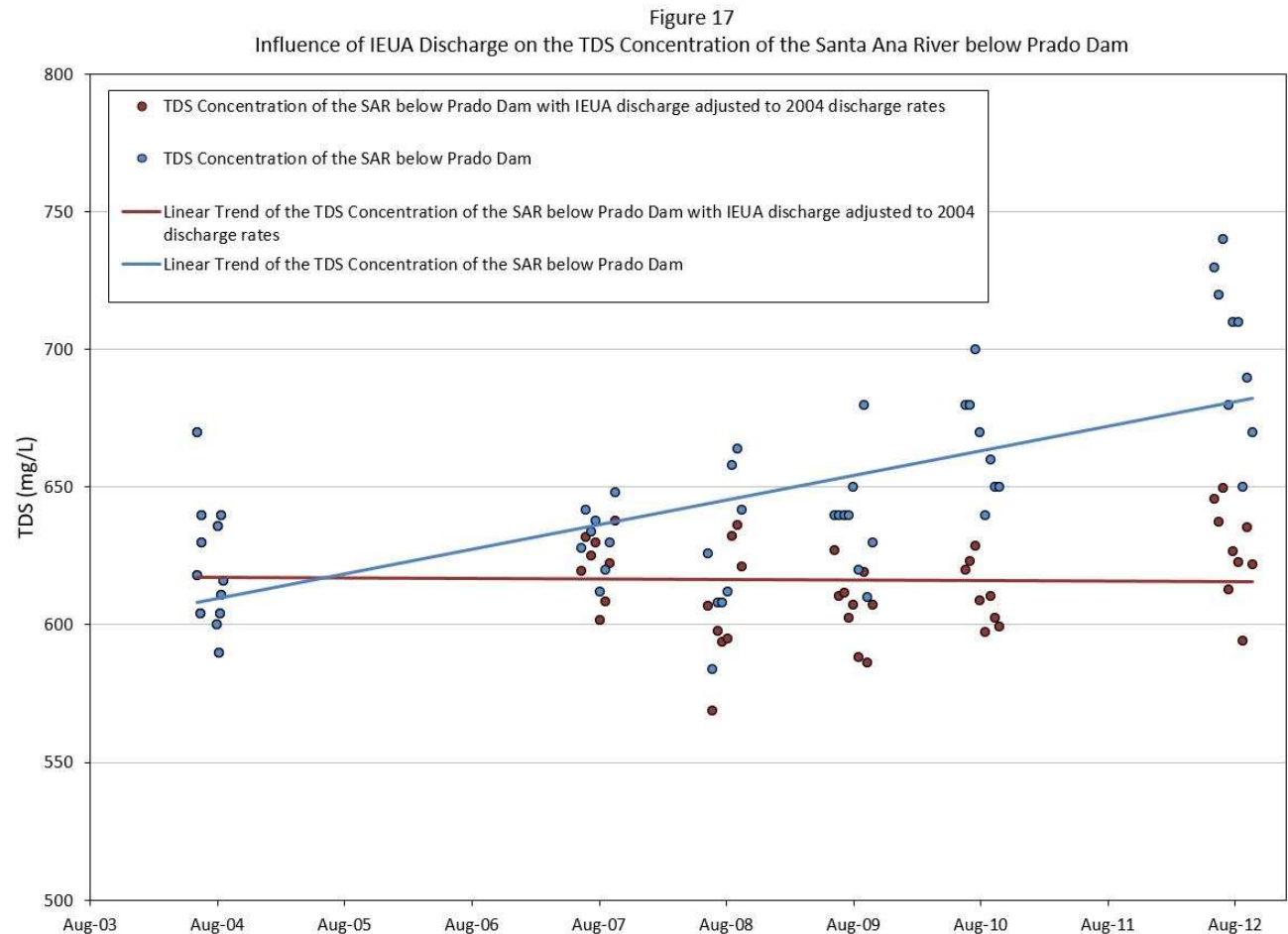
- Basin Plan provides for additional studies beyond what is necessary to assess annual compliance with Basin Plan objectives
- Address data gaps identified by the Task Force, and investigated by West Yost, in the development and use of the WLAM
 - Recent TDS Exceedances in SAR Reach 3
 - Understanding the surface-water/groundwater interaction in SAR Reach 3 and Reach 4
- **Research Objective: *Improve the ability of the WLAM to predict future TDS/TIN conditions in the Santa Ana River***

What Feedback is Needed to Finalize Section 4 on the Special Study Recommendation?

- Proposed monitoring program details:
 - Sampling timing, frequency, duration
 - Sampling locations
 - Constituents
 - Proposed monitoring entity for new surface water monitoring sites: Task Force
- Report will include map and table with description of monitoring plan, including a more refined cost estimate that accounts for Task Force feedback

Recent TDS Exceedances in Reach 3

- Prior studies (2015) indicated that TDS concentrations were increasing due to decreasing POTW discharges tributary to the SAR
- The available data was insufficient to understand the precise dynamics of the surface-water/groundwater interactions along Reach 3 and 4
- Lack of understanding is a barrier to identify potential strategies for maintaining compliance with Basin Plan Objectives

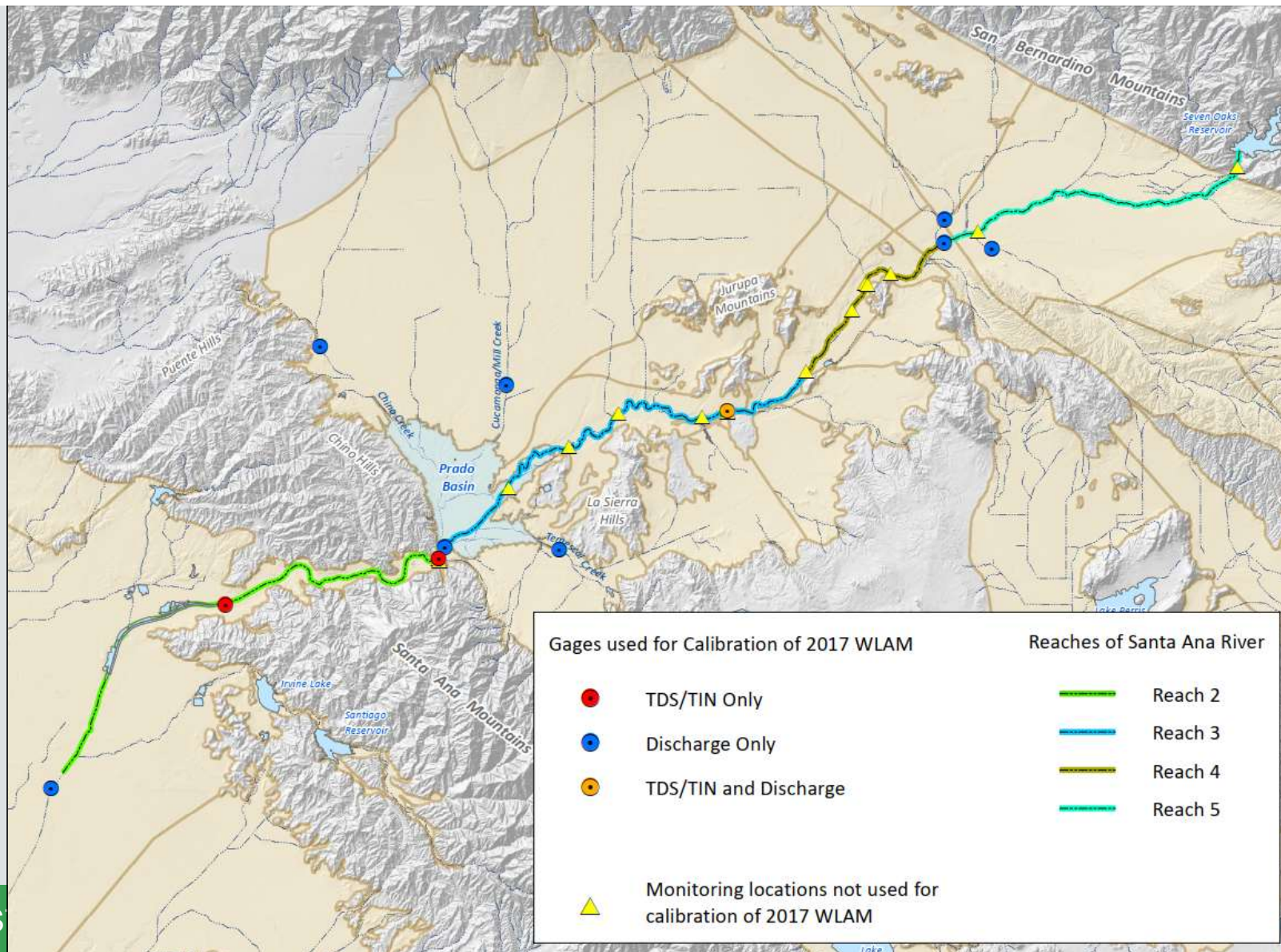


Understanding the Surface-Water/Groundwater Interaction in Reach 3 and Reach 4

- Sensitivity analysis performed during the development of the 2017 WLAM indicated high uncertainty in the representation of streambed infiltration and rising groundwater in Reaches 3 and 4.
- Multiple representations of the surface-water/groundwater interactions within reaches of the Santa Ana River can produce simulated flow/quality at model calibration points that are representative of observed flow/quality.

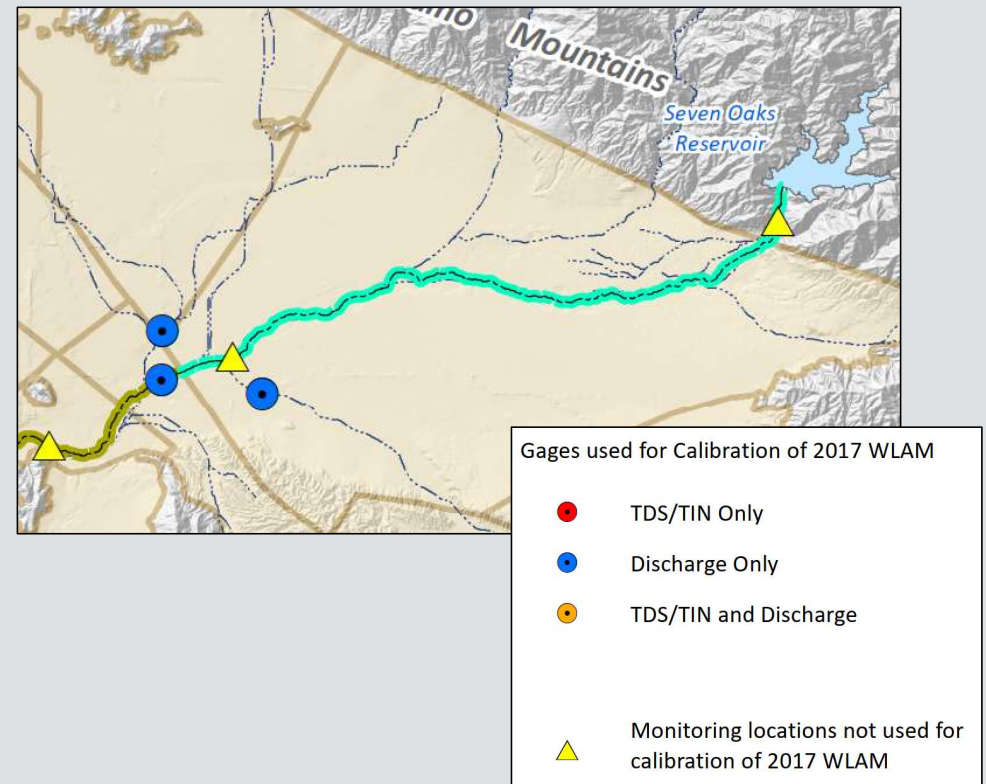
Understanding the Surface-Water/Groundwater Interaction in Reach 3 and Reach 4

- The location, quantity, and quality of streambed infiltration and rising water is not known and thus there is insufficient information to accurately characterize the quality/quantity of water infiltrating into the GMZs overlying Reaches 3 and 4.
- Regional models that simulate surface-water/groundwater interaction (e.g., ISARM, CVM) produce results that are different than the WLAM assumptions/results.
- Field data to understand surface-water/groundwater dynamics and represent them accurately in a model is lacking.



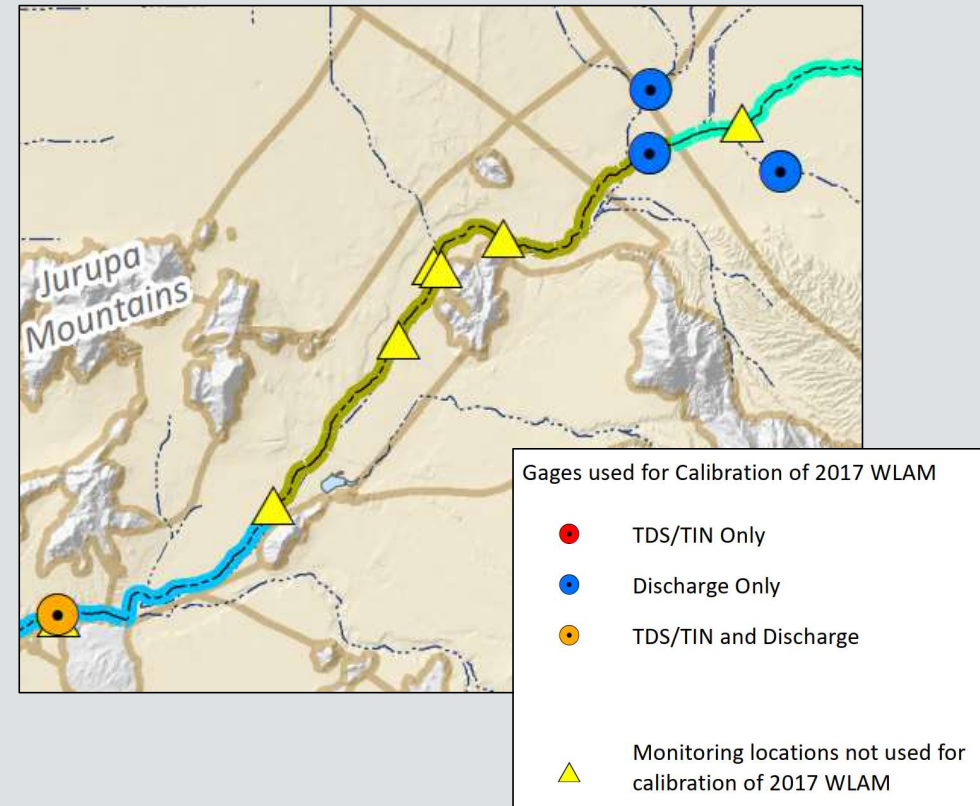
Data Gaps – Reach 5

- Uncertainty in TDS/N concentration of recharge to Bunker Hill-B because no measured data to compare to simulated results from the WLAM



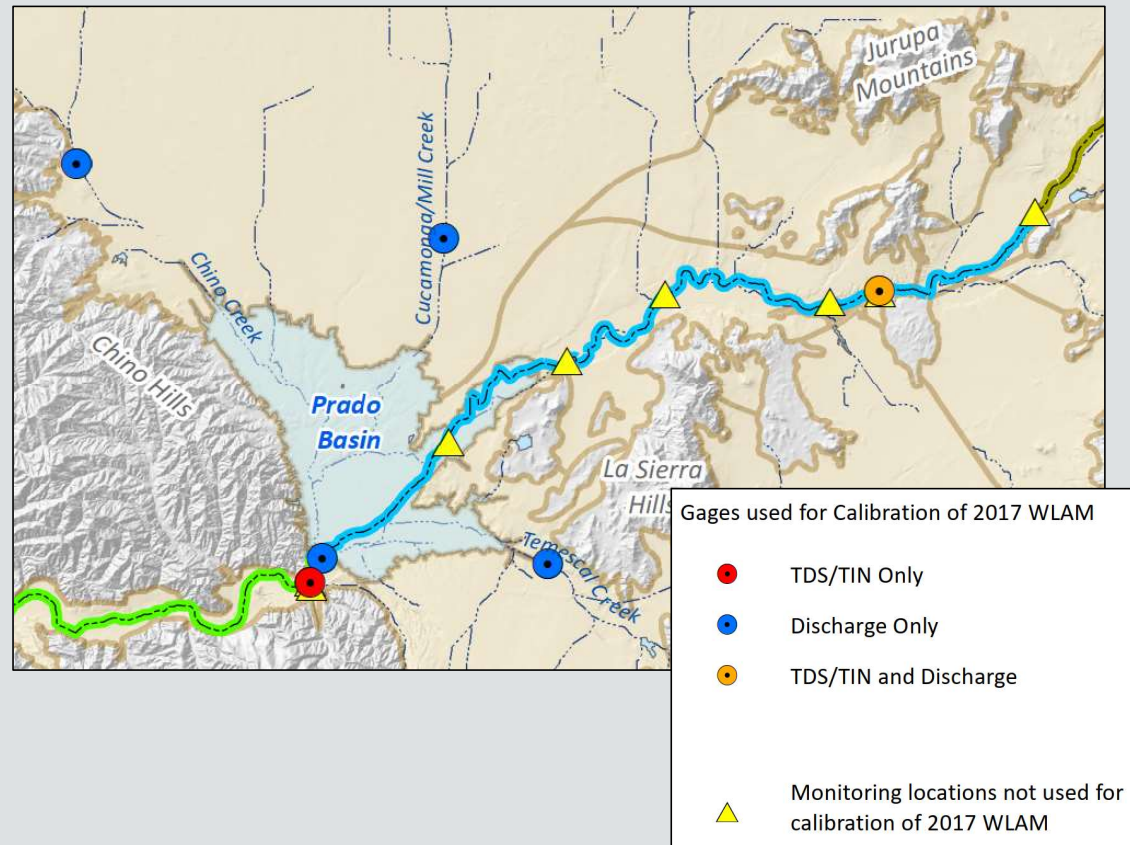
Data Gaps – Reach 4

- Uncertainty in the magnitude and quality of streambed recharge in Riverside-A GMZ



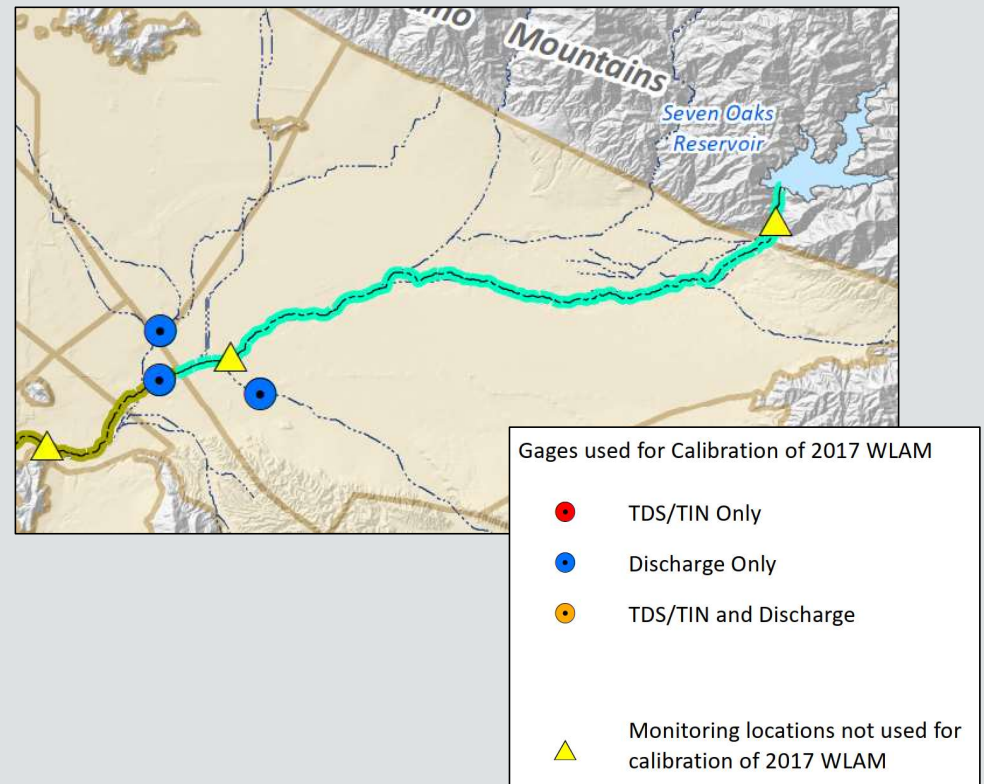
Data Gaps – Reach 3

- Uncertainty in the magnitude, quality, and location of rising groundwater and streambed recharge in Reach 3 and its tributaries

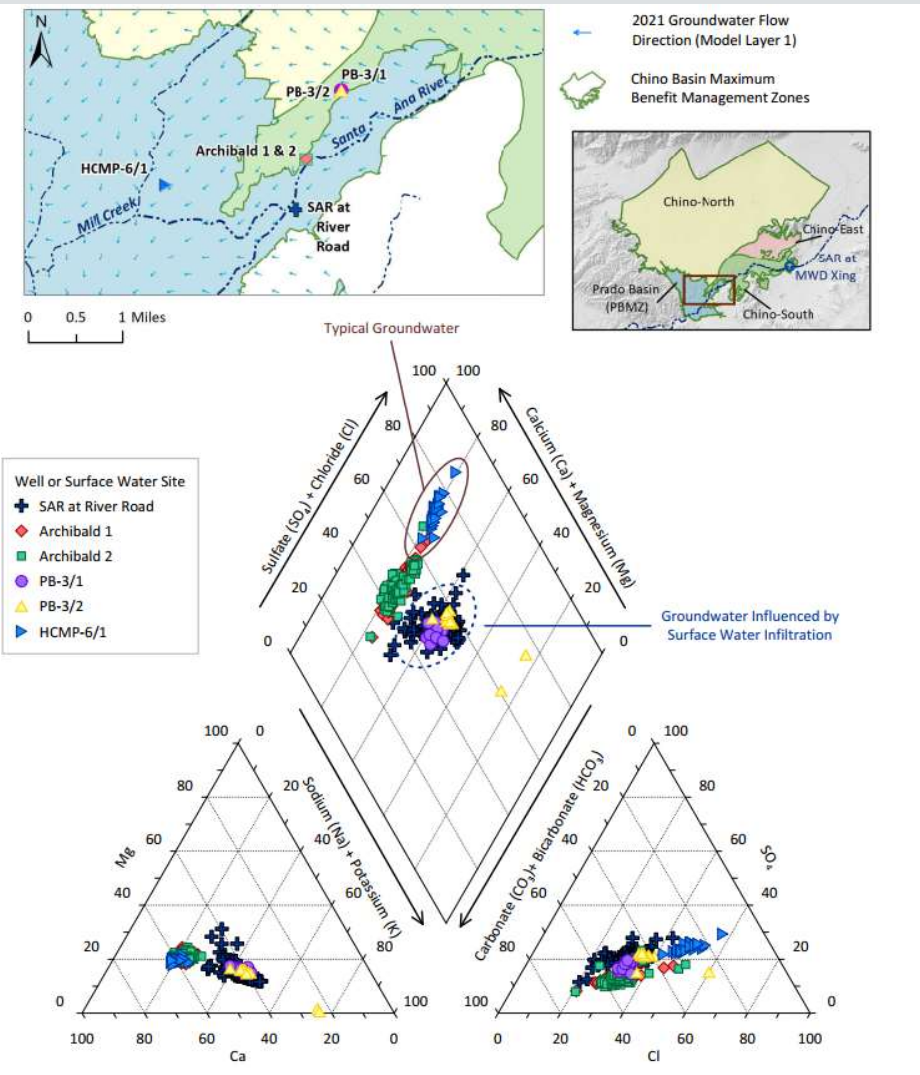


Recommended Monitoring Program to Support the Special Study – Reach 5

- The recommended monitoring to improve the annual assessment of compliance with the Reach 5 TDS/TIN objectives is sufficient to address data gaps
- No additional monitoring for the Special Study is proposed

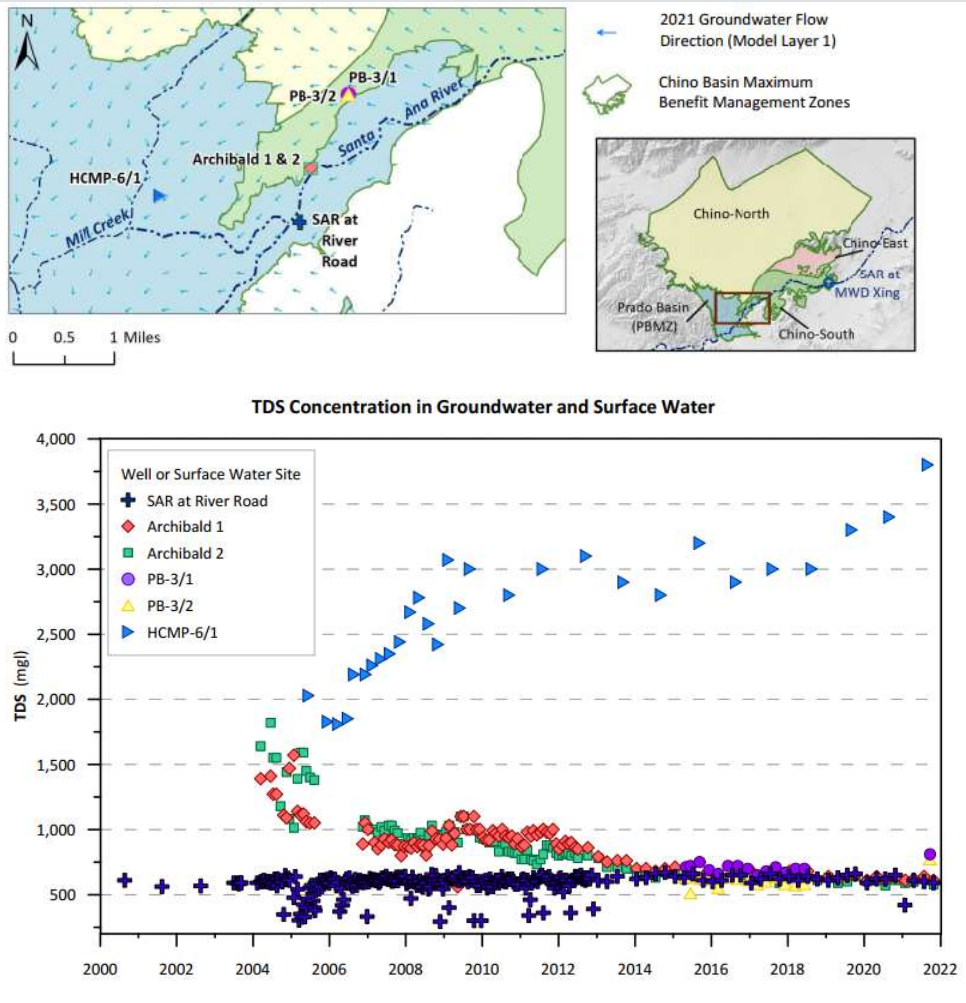


Recommended Monitoring Program to Support the Special Study – Reach 3 and 4



- Review available surface water and groundwater quality data from existing monitoring programs and determine applicability to address data gaps
- Chino Basin Maximum Benefit monitoring
 - Surface and groundwater monitoring
 - Used to assess surface-water/groundwater interactions

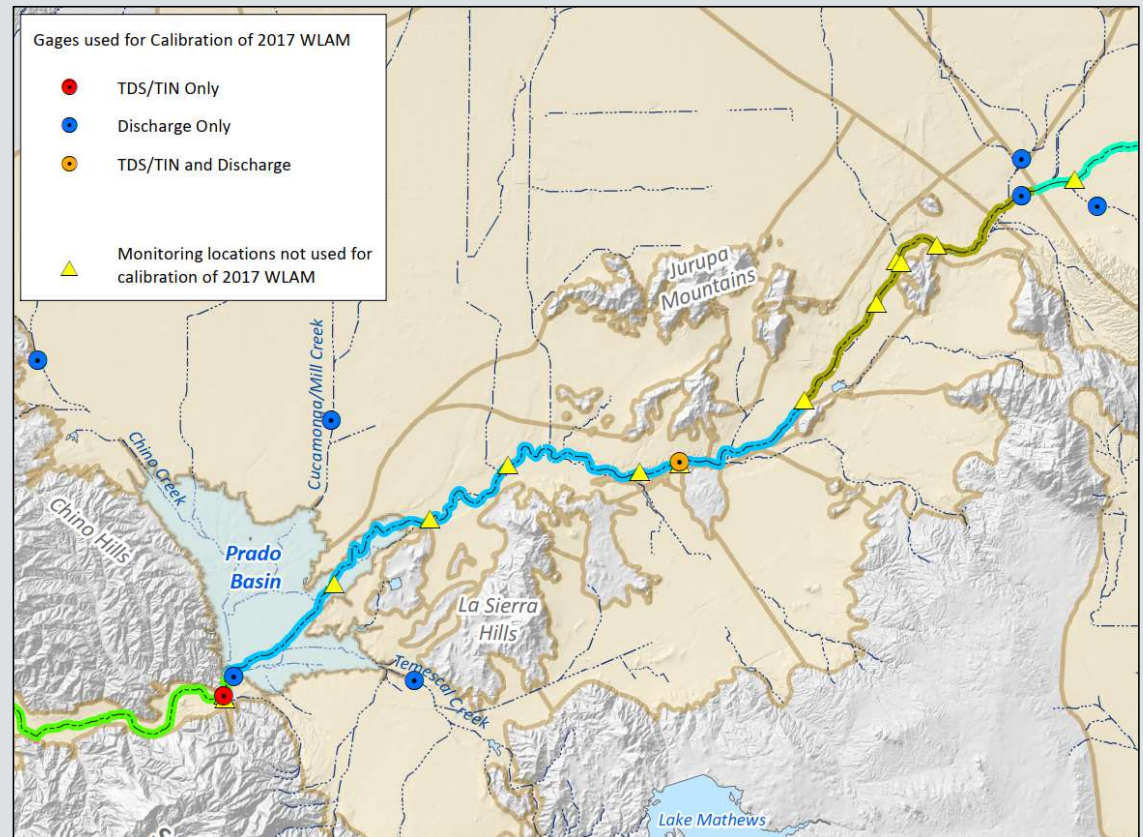
Recommended Monitoring Program to Support the Special Study – Reach 3 and 4



- Changes in cultural conditions change surface-water/groundwater interactions
 - Chino Basin Desalters
- Quarterly sampling adequately captures trends

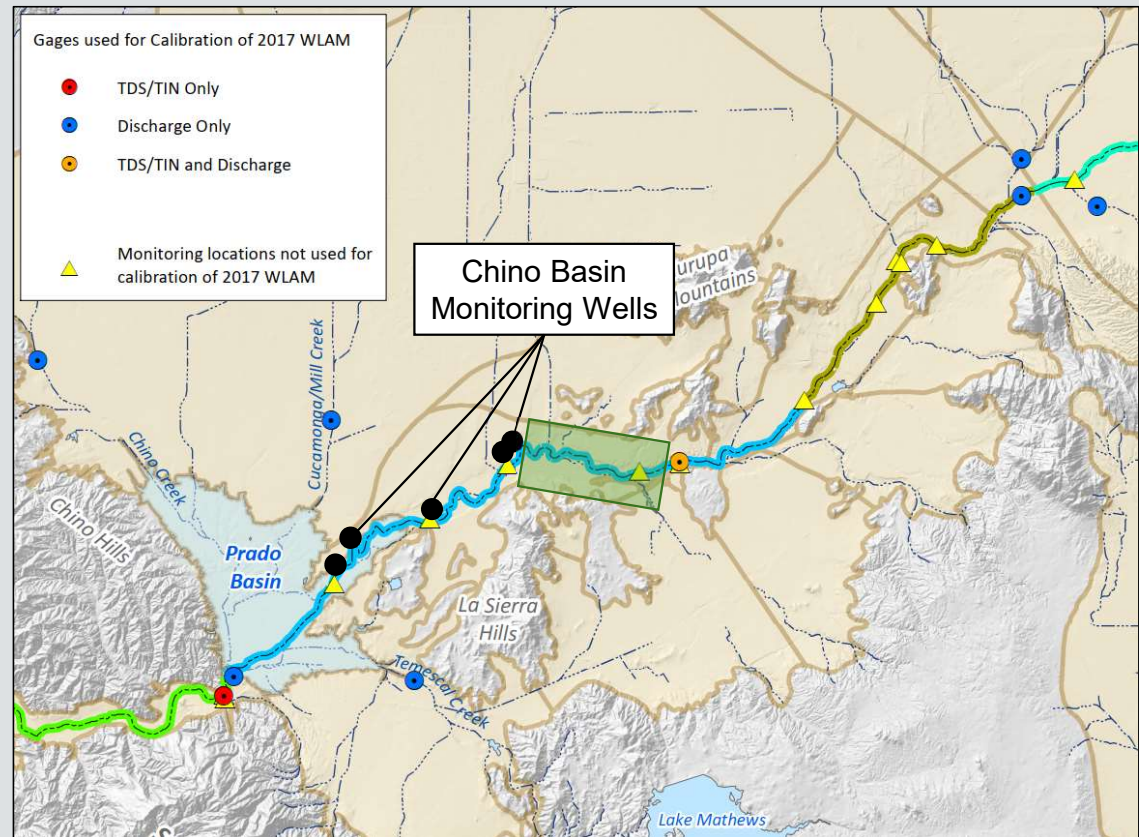
Recommended Monitoring Program to Support the Special Study – Reach 3 and 4

- Quarterly surface water monitoring:
 - 3 monitoring points in SAR overlying Riverside-A GMZ
 - 4 monitoring points in SAR overlying Chino South GMZ
 - 1 monitoring point in each major tributary to Prado Basin
 - Chino Creek
 - Cucamonga/Mill Creek
 - Temescal Creek
 - Arlington Drain



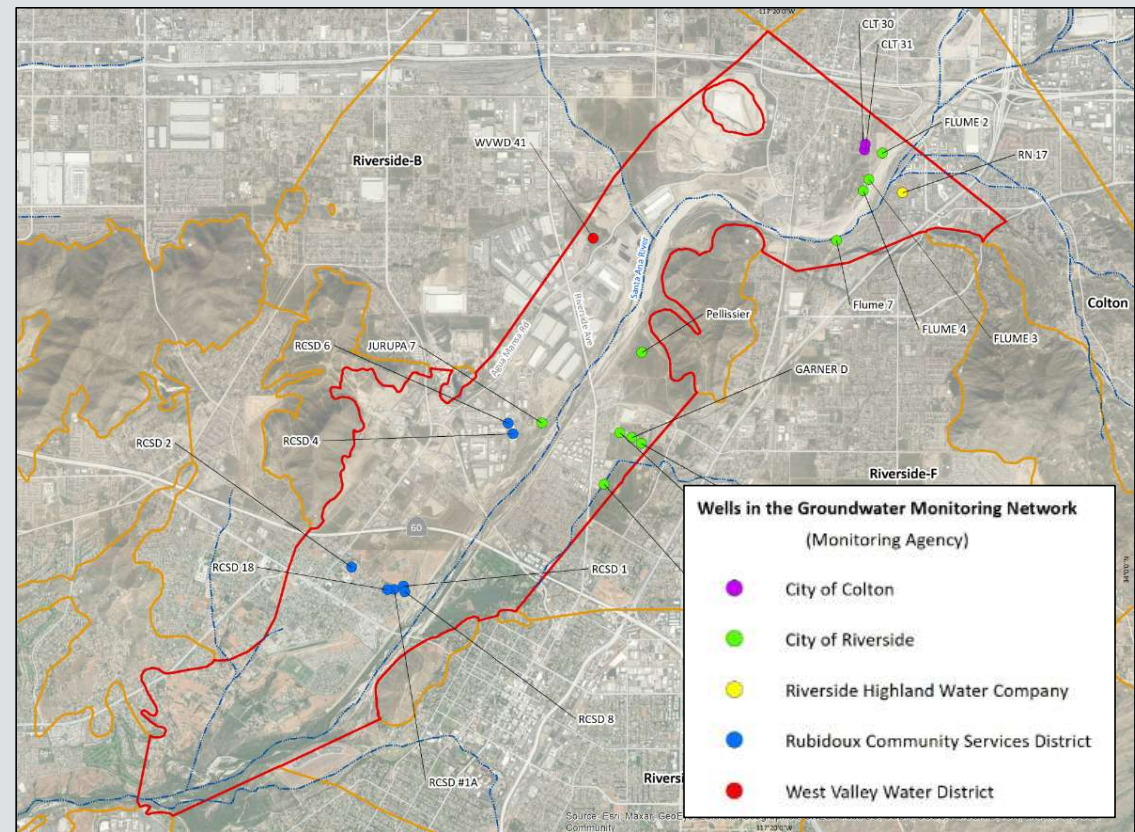
Recommended Monitoring Program to Support the Special Study – Chino South GMZ (Reach 3)

- Groundwater monitoring:
 - Collect existing water quality and groundwater level data
 - Leverage existing monitoring in Chino Basin Max Benefit Program
 - One new monitoring location between Riverside Narrows and Etiwanda



Recommended Monitoring Program to Support the Special Study – Riverside-A GMZ (Reach 3/4)

- Groundwater monitoring:
 - Collect existing water quality and groundwater level data
 - Quarterly monitoring in Riverside-A for wells near proposed surface water monitoring sites

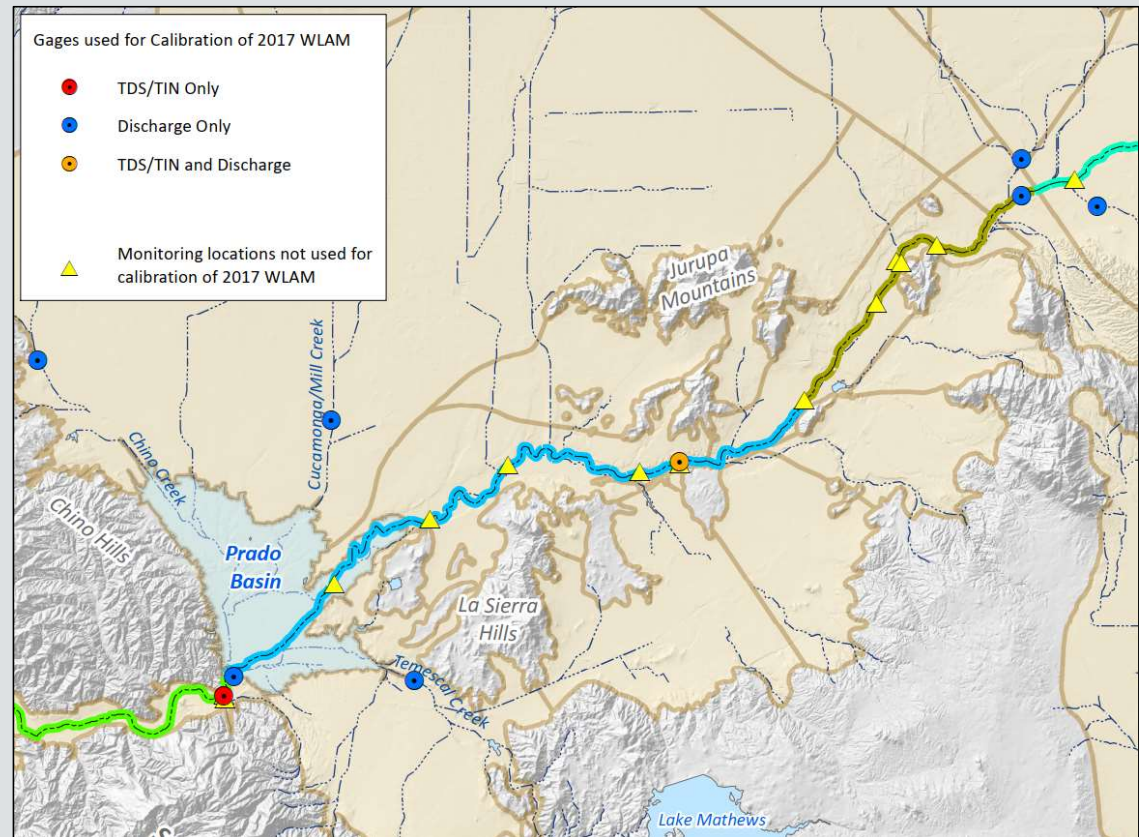


Recommended Monitoring Program to Support the Special Study – Reach 3 and 4

- Water quality parameters:

- Temperature
- TDS/TIN
- Major cations
- Carbonate
- Bicarbonate
- Chloride
- Sulfate

Used to calculate
source water
character (WCI,
Piper, Stiff, etc.)



Recommended Monitoring Program to Support the Special Study

- Estimated cost of first year of monitoring: **\$130,000**
- Assumptions:
 - Quarterly sampling at surface water and groundwater sites
 - Collecting and reviewing relevant monitoring data from outside agencies
 - Outside consultant performs all work
 - TM documenting analysis and recommendations
 - No QAPP required for Special Study monitoring

Research Objective for Special Study

- ***Research Objective: Improve the ability of the WLAM to predict future TDS/TIN conditions in the Santa Ana River***
- The proposed monitoring will provide:
 - Surface water data to better constrain the TDS/TIN concentration of the streambed recharge
 - Groundwater data to better constrain the location and concentration of rising groundwater in Reaches 3 and 4

What Feedback is Needed to Finalize Section 4 on the Special Study Recommendation?

- Sampling timing, frequency, duration
 - Quarterly sampling for two years
- Sampling locations
 - Reach 3, Reach 4, and major tributaries
 - Groundwater wells
- Constituents
 - TDS/TIN, cations, anions, temperature, groundwater levels
- Proposed monitoring entity will be reported as the Task Force
 - Need to determine entity physically responsible for monitoring:
 - Member-agency staff
 - Task Force/SAWPA consultants

Next Steps

- **Continue to receive feedback on the proposed surface water monitoring program**
 - Send feedback to Veva Weamer vweamer@westyost.com or Garrett Rapp grapp@westyost.com
- **Next Task Force Meeting** – further discussion on base flow
- **Prepare Draft Report of the 2022 Santa Ana River Water Quality Work Plan**



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