

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

Update on Recommended Surface Water Monitoring Plan

August 30, 2022



2022 Santa Ana River Water Quality Work Plan

Section 3 - Surface Water Monitoring Program to Assess Compliance with Basin Plan TDS and Nitrogen Objective. Remaining items to discuss:

- **Reach 3:** Filtered Total Nitrogen requirement for TIN Objective
- **Reach 2:** Use of the 5-year average of SARWM volume-weighted method vs. 60-month volume-weighted method
- **Reach 2 and 3:** The ability to upload calculated TDS from EC measurements to CEDEN

Reach 3 Filtered Total Nitrogen requirement for TIN Objective

Reach 3 Recommendations for the 2022 Work Plan:

- Remove the requirement to collect filtered total nitrogen samples for compliance*
*Amend Basin Plan to Incorporate this into the SNMP Compliance Plan

Table 4-1 in Basin Plan for the Santa Ana River Basin:

INLAND SURFACE STREAMS	WATER QUALITY OBJECTIVES (mg/L)							Hydrologic Unit	
	Total Dissolved Solids	Hardness	Sodium	Chloride	Total Inorganic Nitrogen	Sulfate	Chemical Oxygen Demand	Primary	Secondary
UPPER SANTA ANA RIVER BASIN									
Santa Ana River									
Reach 3 – Prado Dam to Mission Blvd. in Riverside – Base Flow ²	700	350	110	140	10 ³	50	30	801.21	801.27, 801.25
Reach 4 – Mission Blvd. in Riverside to San Jacinto Fault in San Bernardino	550	---	---	---	10	---	30	801.27	801.44
38 at Upper Powerhouse to Headwaters	110	100	25	5	1	15	5	801.38	

² Additional Objectives: Boron: 0.75 mg/l

³ Total nitrogen, filtered sample

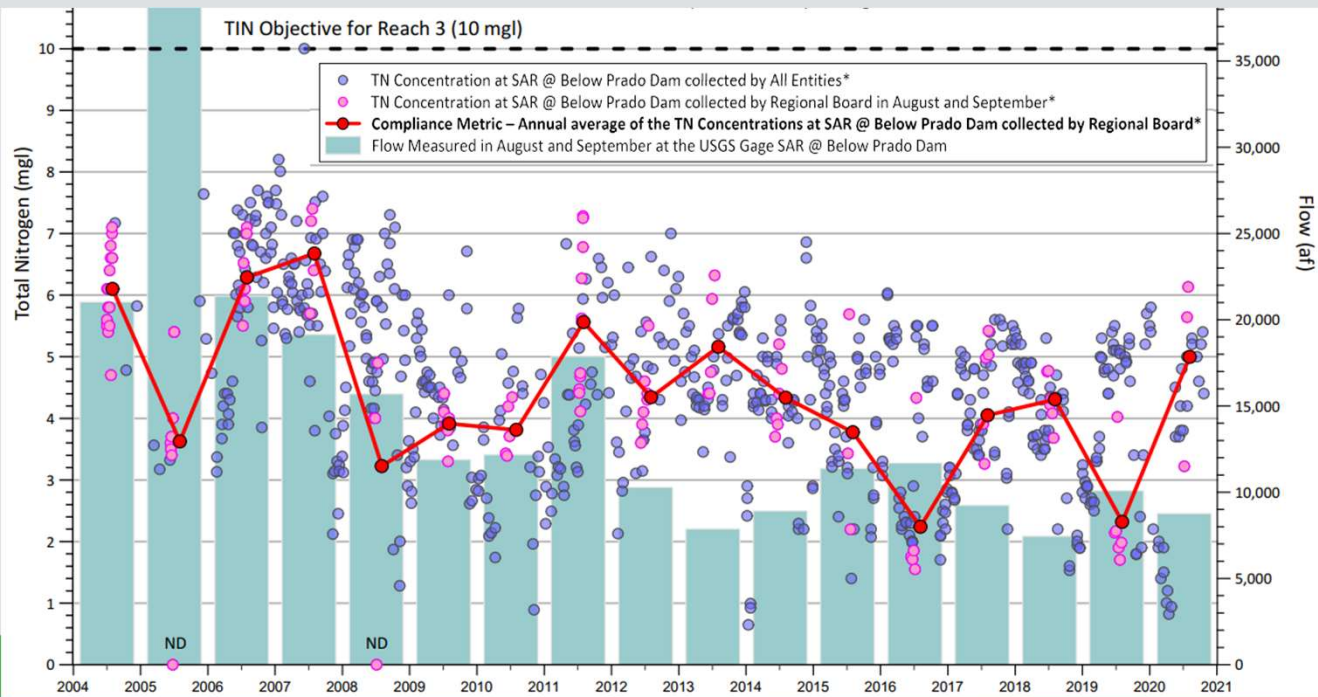
WATER QUALITY OBJECTIVES

4.10

January 24, 1995
Updated June 2019 to
include approved amendments

Reach 3 Filtered Total Nitrogen requirement for TIN Objective

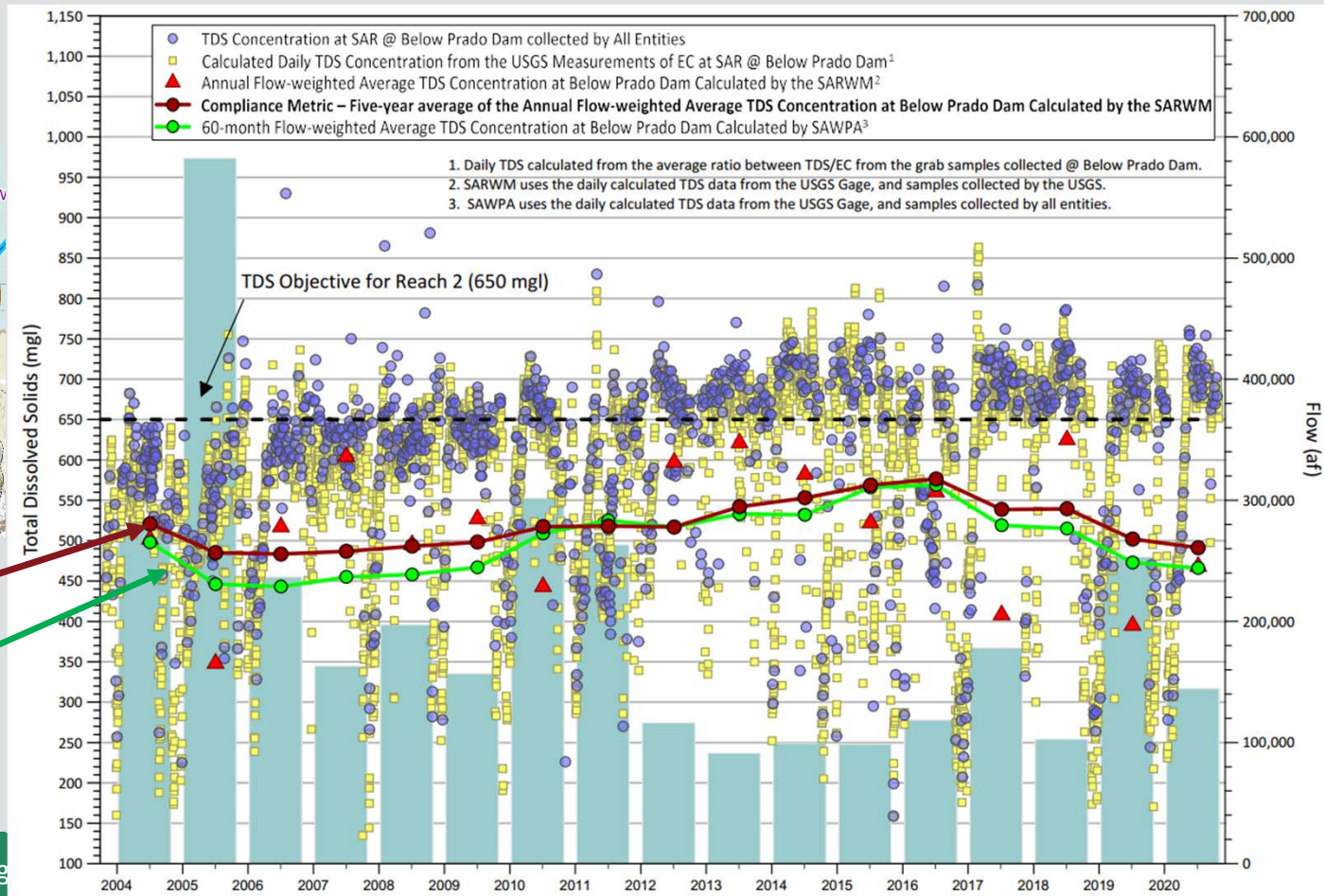
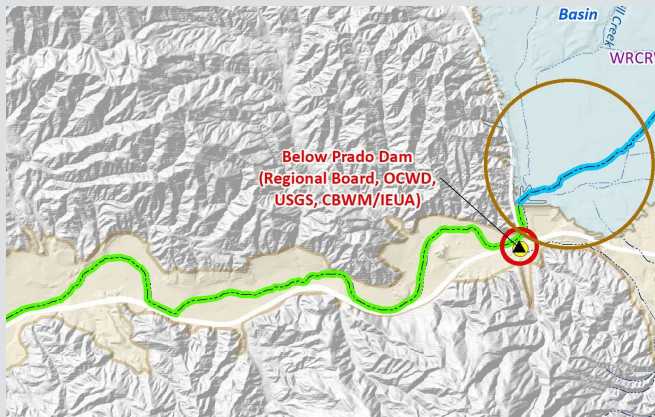
ST_ID	Station_Name	StaType	Sample_Date	Parameter	Result	Unit	Data_Source
1129614	Below Prado Dam	Surface	9/1/2020	Total Inorganic Nitrogen	2.2	mg/L	Regional Water Quality Control Board
1129614	Below Prado Dam	Surface	9/1/2020	Total Nitrogen (filtered)	3.2	mg/L	Regional Water Quality Control Board
1129614	Below Prado Dam	Surface	9/16/2020	Total Inorganic Nitrogen	4.3	mg/L	Regional Water Quality Control Board
1129614	Below Prado Dam	Surface	9/16/2020	Total Nitrogen (filtered)	5.6	mg/L	Regional Water Quality Control Board
1129614	Below Prado Dam	Surface	9/22/2020	Total Inorganic Nitrogen	4.9	mg/L	Regional Water Quality Control Board
1129614	Below Prado Dam	Surface	9/22/2020	Total Nitrogen (filtered)	6.1	mg/L	Regional Water Quality Control Board



- TN filtered sample is conservative
- 2004-2020 TN filtered metric well below the 10 mg/l objective for TIN
- Feedback on the removal of the TN filtered requirement for Reach 3

Use of the 5-year average of SARWM volume-weighted calculation (Basin Plan Method) vs. 60-month volume-weighted method (Alternative 60-month Method)

Reach 2 - TDS Objective – Volume-weighted metric



Basin Plan Method

(5-yr Avg of SARWM Annual Calc)

Alternative Method

(60-month Avg)

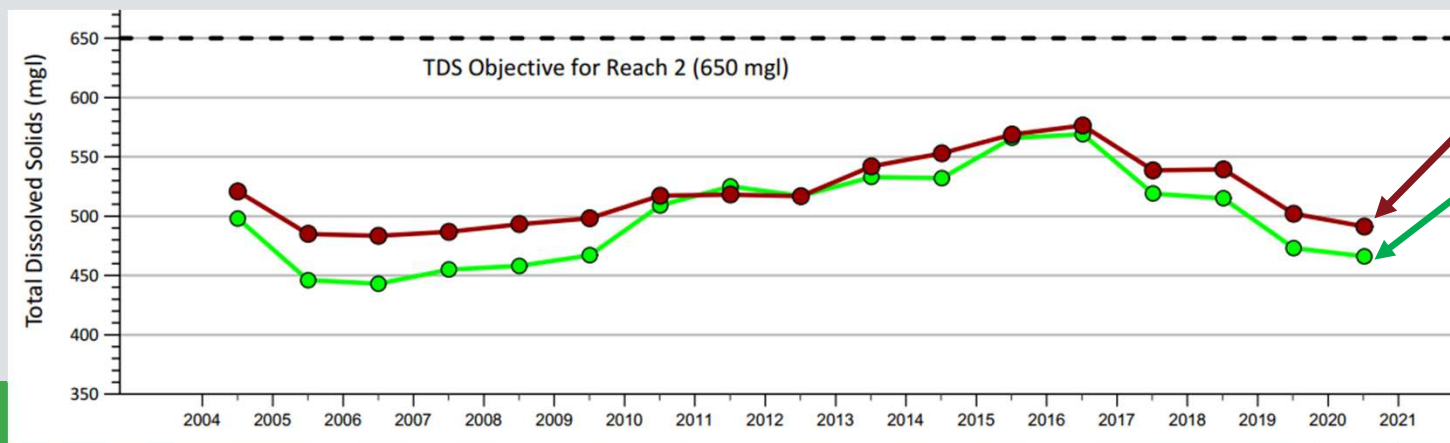
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Reach 2: Use of the 5-year average of SARWM volume-weighted calculation (Basin Plan Method) vs. 60-month volume-weighted method (Alternative 60-month Method)

Table 2. Difference between the Two Methods used to Calculate the Five-year Volume-Weighted TDS Concentration at Below Prado Dam for Reach 2

Method	Year Type	Source of Grab Sample Data Used to Calculate a TDS and EC Relationship	Type of Calculation used to Determine Relationship between TDS and EC, to calculate a daily TDS	Calculation Type
Described in the Basin Plan	Water Year	USGS	Average Ratio (EC/TDS) $TDS = (EC \times 0.6087)$	Arithmetic Mean of five different annual volume-weighted averages
Alternative	Calendar Year	USGS, OCWD, Regional Board	Linear Regression Model $TDS = (EC \times 0.5746) + 41.25$ $R^2 = .92$	Five-year (60-month) volume-weighted average



5-yr Avg of Annual SARWM

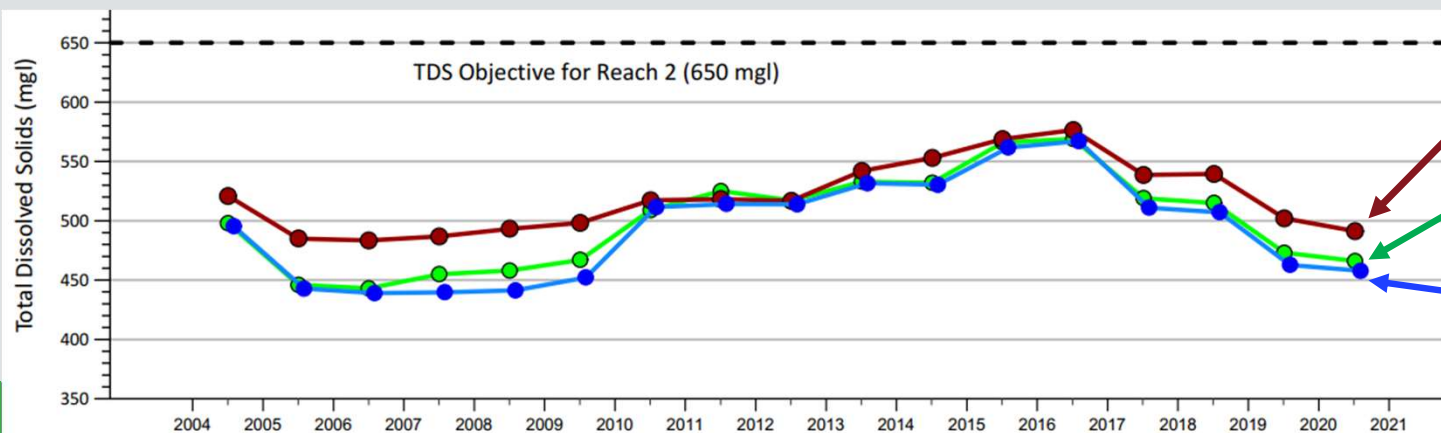
60-Month Avg

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Difference between using the linear regression and TDS/EC Ratio to calculate TDS → **minimal difference.**



5-yr Avg of Annual SARWM

60-Month Avg - Using Linear Regression

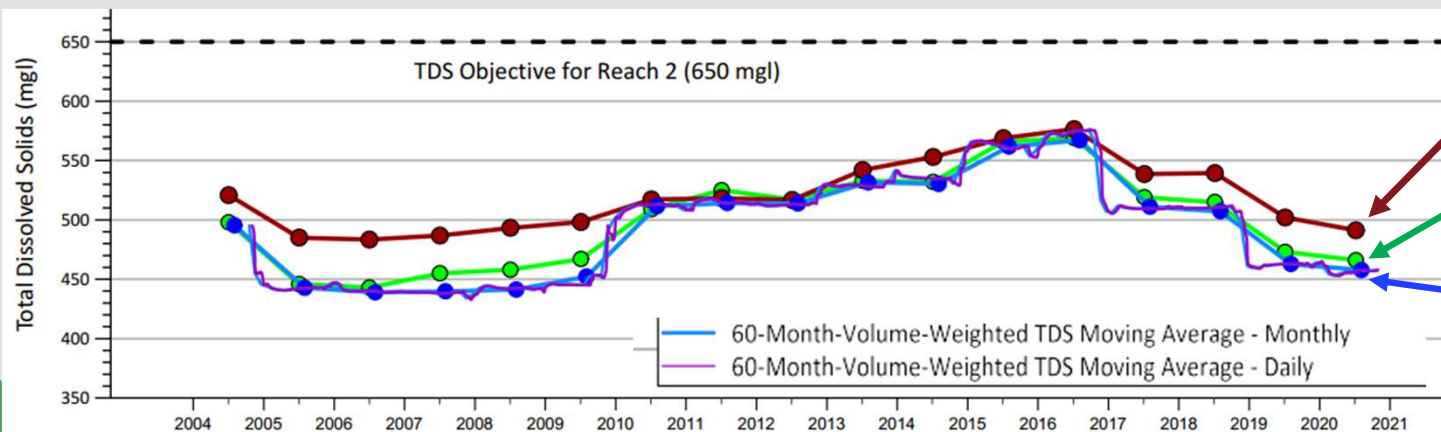
60-Month Avg - Using TDS/EC Ratio

Reach 2: Use of the 5-year average of SARWM volume-weighted calculation (Basin Plan Method) vs. 60-month volume-weighted method (Alternative 60-month Method)

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Using the 60-month method allows for evaluating running averages for various frequencies



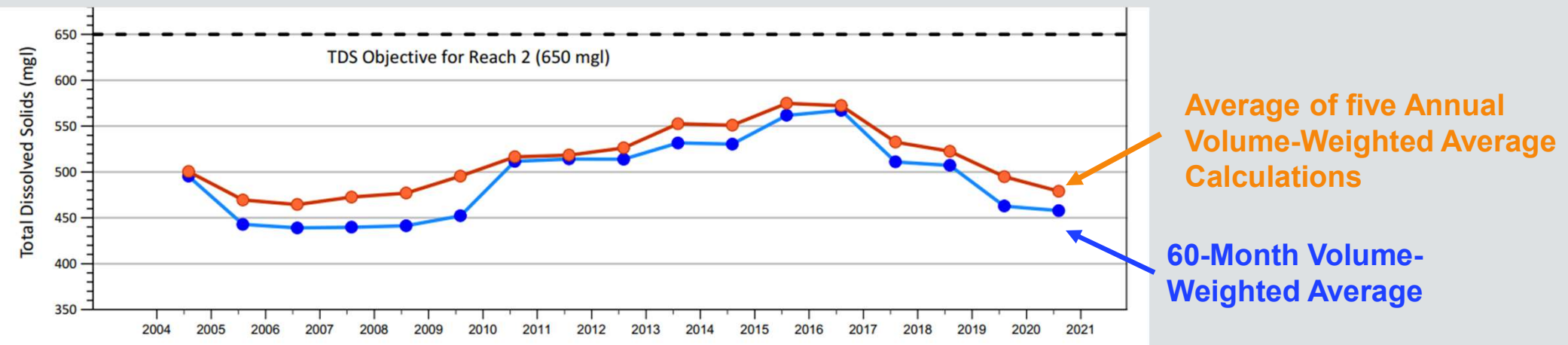
5-yr Avg of Annual SARWM

60-Month Avg – Using Linear Regression

60-Month Avg - Using TDS/EC Ratio

Reach 2: Use of the 5-year average of SARWM volume-weighted calculation (Basin Plan Method) vs. 60-month volume-weighted method (Alternative 60-Method)

Demonstration of difference between averaging period methods, using the exact same data set:

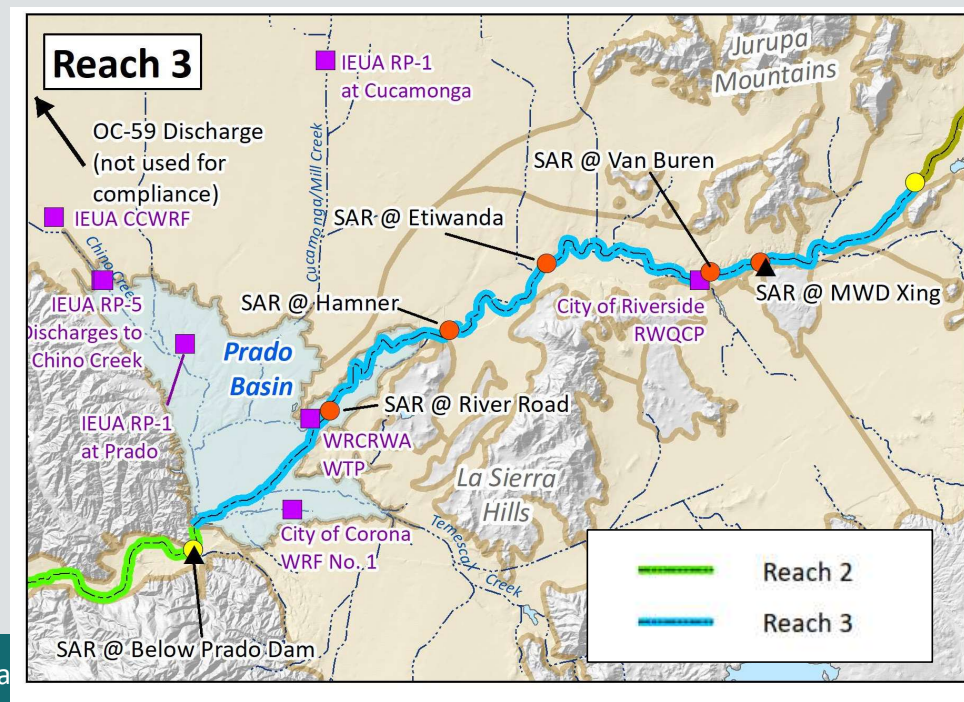


What is left to Discuss to Complete 2022 Santa Ana River Water Quality Work Plan

- Method for Reach 2: Use of the 5-year average of annual SARWM volume-weighted averages **vs.** 60-month volume-weighted average.
- If use 60-month volume-weighted average, which method should be used to calculate the daily TDS from EC measurements
 - Average TDS/EC Ratio
 - Linear Regression Equation
 - Should be consistent with that used for Reach 3 TDS objective compliance
- Changing the filtered TN requirement to TIN for compliance with the Reach 3 TIN Objective

Upload to CEDEN of Daily Calculated TDS Data from the Daily EC Measurements

- We are proposing to use the daily calculated TDS concentrations from the daily EC measurements at the Below Prado Dam USGS gage for both Reach 2 & 3
- Possible to use the Daily TDS – The EC data would need to be uploaded into CEDEN as EC and then the Regional Board would need to calculate the TDS.
- Basin Plan must include a clear description of the calculate methods



Next Steps

- **Prepare Draft Report of the 2022 Santa Ana River Water Quality Work Plan**
 - Draft in early October 2022
 - 21-day review period by the Task Force



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