

Construct TDS/N Forecasting Tools and Evaluate the Baseline Scenario

Coachella Valley Salt & Nutrient Management Plan (CV-SNMP)

TM #5 describes the development and use of forecasting tools to project how groundwater quality may change across the Coachella Valley between 2020 and 2070 under the current land use, water use, and water disposal plans in the Valley. This projection is called the “Baseline Scenario”—the benchmark against which future management options will be compared.

The groundwater-quality constituents being analyzed are:

- Total Dissolved Solids (TDS) – a measure of salinity
- Nitrate ($\text{NO}_3\text{-N}$) – a common form of nitrogen in groundwater

The Groundwater Forecasting Toolkit includes:

- ✓ Groundwater-flow models
- ✓ Water-quality (solute transport) models
- ✓ Model validation exercise using 2010–2019 data
- ✓ Future model projections through 2070

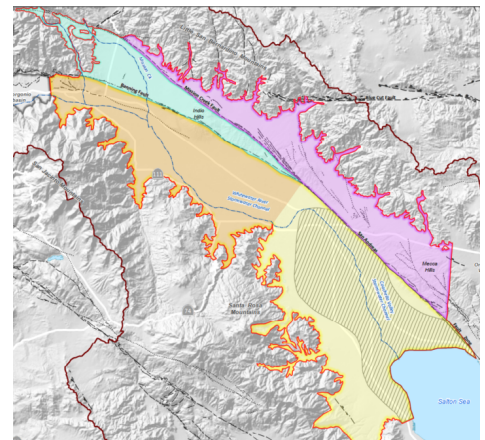


Fig 1. Groundwater Management Zones

The forecasting tools help answer: “If current plans and practices continue, what might groundwater quality look like in the future?”

WHAT IS THE BASELINE SCENARIO?

The Baseline Scenario represents currently planned water supply, wastewater, recharge, and groundwater management activities through 2070, including anticipated future projects and climate change impacts.

The Baseline Scenario is not a preferred future or recommended strategy. It can be thought of as: “What happens if we stay on our current path?”

See a draft
TM#5 animation
here:



Access the full
draft TM#5
here:



Use caution in interpretation of these animations. These animations show model-based projections of TDS and nitrate concentrations from 2020–2070 by aquifer layer for illustrative purposes only. Results are subject to uncertainty and should not be relied upon as guarantees of future water quality. Concentrations of pumped groundwater will be a blend across aquifer layers.

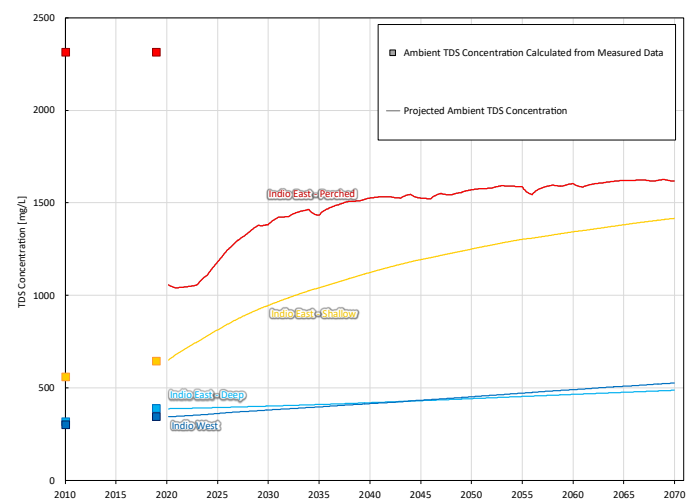


Fig 2. Projected Ambient TDS Concentration for the Indio Subbasin 2020 -2070

WHERE DOES TM #5 FIT INTO THE CV-SNMP PROCESS?

TM #1 – Sources: Where do salts & nutrients come from?

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TM # 2 – Current Conditions: What is groundwater quality today?

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TM# 3 – Management Zones: How do we measure groundwater quality?

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TM #4 – Forecast Approach: How should we forecast future conditions?

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TM # 5 – Baseline Scenario: What happens to groundwater quality under our current plans?

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TM #6 – Evaluate Options: What management actions could improve future outcomes?

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TM #7 – Analyze Costs: What would it cost to implement the management actions?

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Final CV-SNMP Report

KEY FINDINGS FROM TM #5

Finding #1: Groundwater-quality concentrations are generally projected to increase.

The models indicate gradual increases in TDS and nitrate concentrations over time across the Coachella Valley.

Finding #2: Groundwater quality is generally projected to remain protective of drinking water standards.

Projected TDS and nitrate concentrations in drinking water supplies are generally projected to remain below the applicable drinking water standards through 2070. Exceedances are anticipated in the Indio East perched and shallow Groundwater Management Zones. Groundwater use in these zones is limited to agricultural and golf course irrigation.

Finding #3: Wastewater salinity is expected to increase over time.

The modeling indicates that TDS concentrations in treated wastewater are expected to gradually increase through 2070, due to increasing salinity in the groundwater and water supplies used locally.

Finding #4: Changes are not uniform across the valley.

Future trends vary by location, groundwater depth, nearby recharge and loading sources, and local hydrogeology.

Key Takeaway: TM #5 provides the scientific foundation for evaluating future groundwater quality conditions in the Coachella Valley. The results help identify where trends may emerge over time and establish a baseline against which future management strategies can be compared.

WHAT HAPPENS NEXT? TM #6 will evaluate potential management strategies and compare them to the baseline to determine which approaches most effectively protect groundwater quality over the long term.

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