

# **Report on Salinity Management**

Engineering and Operations Committee Item 6c September 13, 2021

# What is salinity?

- Measurement of salts (minerals) dissolved in water
- Commonly expressed as Total Dissolved Solids or "TDS"
- Naturally occurring, agricultural runoff, urban uses, seawater intrusion



# Why does salinity matter?

- Limits use of groundwater basins for storage
- Lowers usefulness and increases cost of recycled water
- Scaling of household appliances and plumbing fixtures; impacts industrial processes
- Reduces agricultural crop yields
- Imparts unpleasant taste in drinking water



### Salinity in Metropolitan Supplies Historical Trends





L3, 2021

# **Colorado River Basin Salinity Control Program**

- Salinity Control Forum (1973); federal government and Basin states
- Salinity control measures
  - Improved irrigation practices
  - Rangeland management
  - Deep-well brine injection
- I.2 million tons/year removed → 100 mg/L reduction
- ~\$40 million spent annually; 70% federally funded
- Current challenges: Paradox Valley; Funding





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### Paradox Valley Salinity Control **Deep Well Injections**

Paradox Valley Unit Injection Well > < Collection Wells **Dolores River** Saline Groundwater 6.3 **Dolores** River States of the second **Injection Well Collection Wells** 

Montrose County, Colorado

Photo courtesy of CRBSCF

# Paradox Valley Salinity Control Status

- Well hasn't operated since 4.1 magnitude earthquake in March 2019
  - Reclamation analyzing injection and seismic data to optimize operations
- Final EIS analyzed replacement options. new injection well, evaporation ponds, zero liquid discharge, and no action
- Lake Powell and Lake Mead provide significant buffers



Office of the Galeria Mariane

January 11, 2021

Ma. Brenda Burman, Commissioner U.S. Bureau of Reclamation 1849 C Street NW Washington, D.C., 20246-000

Dear Commissioner Borman:

Comments on the Paradox Valley Unit of the Colorado River Basin Salinity Control Program

The Meropolitan Water District of Southern California (Metropolitan) has reviewed the Patudox Valley Unit (PVU) of the Colorado River Basin Salinity Control Program Final Environmental Impact Statement (FEIS). We appreciate the substantial efforts undertaken by the Bureau of Reclamation (Reclamation) to complete this effort. However, as the PVU is a critical component of the Colorado River Basin Salinity Control Program, Metropolitan is concerned with Rechamation's preferred No Action Alternative finding in the FEIS. Metropolitan respectfully requests that Reclamation not issue a Record of Decision for the FEIS and keep the door open for additional options to be explored that might be acceptable to Reclamation to continue

robicing satiroty in the Colorade River from sources in the Paradox Valley. Metropolitan is a regional water wholesafer that delivers approximately two million acre-feet of

water per year to its 26 public member agencies, who in turn provide water to nearly 19 million residents in Los Angeles, Orange, Riverside, San Bernardino, San Diego, and Ventura counties. To supply the more than 300 cities and an incorporated areas in Southern California with safe and reliable water, Metropolitan owns and operates an extensive water system including the Colorade River Aqueduct, 16 by droelectric facilities, nine reservoirs, 830 miles of large-January pipes, and five water treatment plants. Maintaining a high level of water quality in the Onemeter piper, and are more transmissing particular and as a member of the Colorado River Colorado River is of atmost importance to Metropolitiza and as a member of the Colorado River

Danin Salinity Control Forum and major funder for the Salinity Control Program, Metzopolitan has made significant investments in controlling the salinity of the Colorado River. Increasing satinity levels being about a myriad of challinges to Southeen California water

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lox Valley Unit

Injection Well

### Colorado River Historical Salinity Whitsett Intake



### State Water Project Primary Salinity Sources

Sacramento River Low TDS

CVP

SF Bay Seawater Intrusion

> False River Barrier

### **Clifton Court Forebay**

SWP

Sacramento Cross Channel

Gate

In-Delta Ag Drainages

> San Joaquin River Naturally Occurring Agriculture Wetlands

Stockton

## **Statewide Salinity Management Efforts**

- Delta-State Water Project
  - Delta Cross Channel Gate
  - Emergency Drought Salinity Barrier
  - Salinity forecasts
- Central Valley Salinity Alternatives for Long-term Sustainability (CV-SALTS) Initiative
- Salt and Nutrient Management Plans



# Salinity Management Study

- Study estimated \$95 million/yr economic benefit with 100 mg/L salinity reduction (1999 dollars)
- Metropolitan Board adopted 500 mg/L TDS objective, annual average
  - System Blending
  - Dependent on availability of sufficient SWP water
- Protect imported source water
- Support groundwater and recycled water resources

### SALINITY MANAGEMENT STUDY Final Report





UNITED STATES DEPARTMENT OF THE INTERIOR BUREAU OF RECLAMATION

June 1999

**E&O** Committee

# Salinity Economic Impact Model

#### Impact Sectors

- Developed by USBR and Metropolitan; updated in 2020
- Quantifies economic impacts of salinity
  - Reduced appliance/ plumbing fixtures useful life
  - Reduced crop yields
  - Groundwater & Recycling impacts
- \$500 million/yr damages to lower Colorado River Basin (2035 projection)



- AgricultureResidentialCommercialGroundwater
- Recycled Water Utilities
- Industrial

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# Efforts to Meet Salinity Goal

- Transfer and Exchange Programs
- Local Storage
  - Inland Feeder/ Diamond Valley Lake
- Operating Principles
  - Meet water quality requirements and salinity objectives





## **TDS Trends at Blend Plants**



## **Moving Forward**

- Work with Reclamation to find a long-term replacement for the Paradox Well and develop a sustainable funding plan for the Salinity Control Program
- Invest in reliable Delta water supplies
- Manage system to meet salinity management policy objectives
- Collaborate with stakeholders on regional approaches
  - Southern California Salinity Coalition
  - Future Supply Actions Funding Program
  - Participate in other state and national programs

