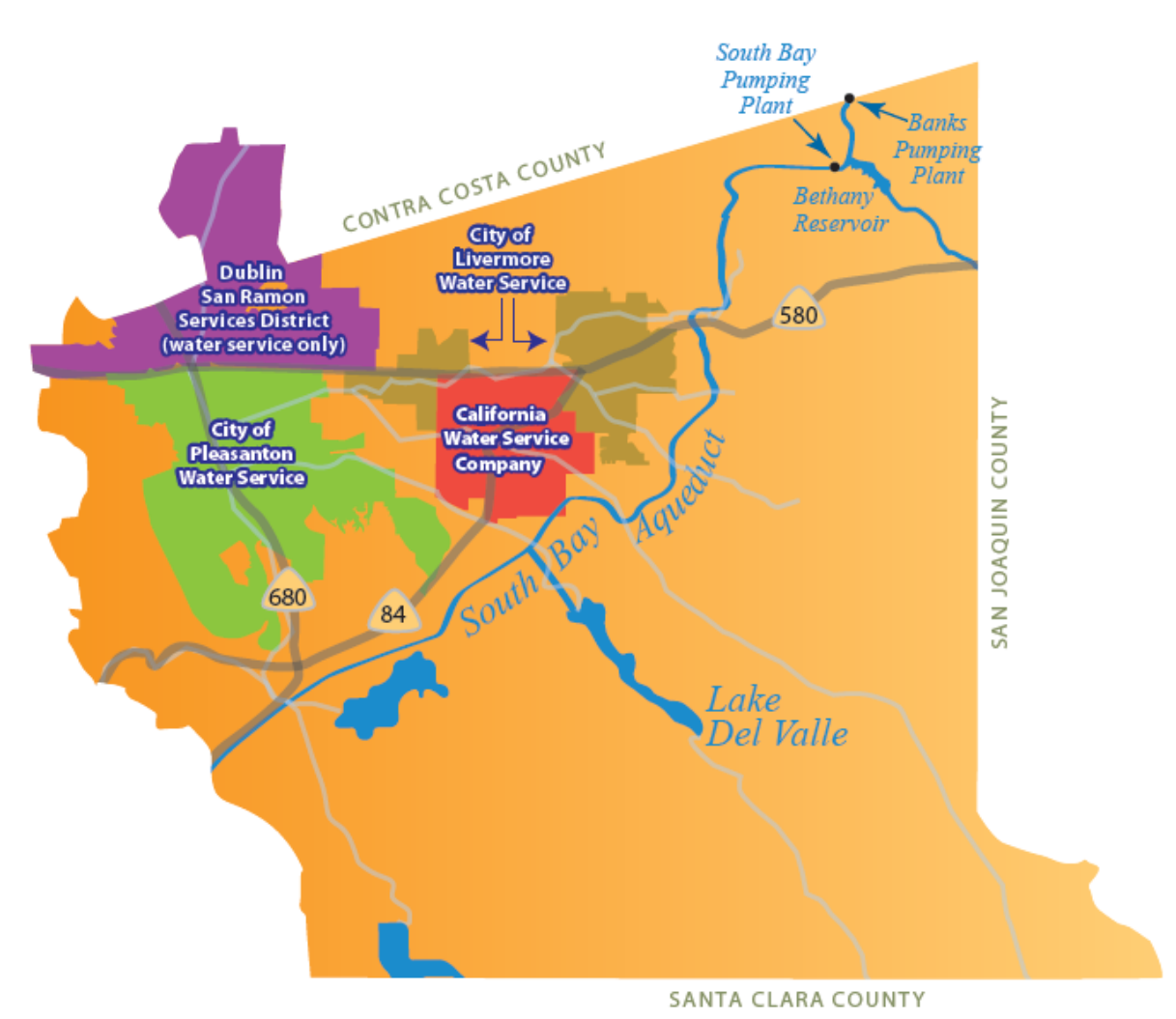
Image Source: Australian Academy of Technological Sciences and Engineering (ATSE)

Opportunities for Potable Reuse in the Livermore-Amador Valley

Brad Ledesma| Associate Engineer – Integrated Planning

What is Zone 7?

WHOLESALE WATER SUPPLIER
For Livermore-Amador Valley

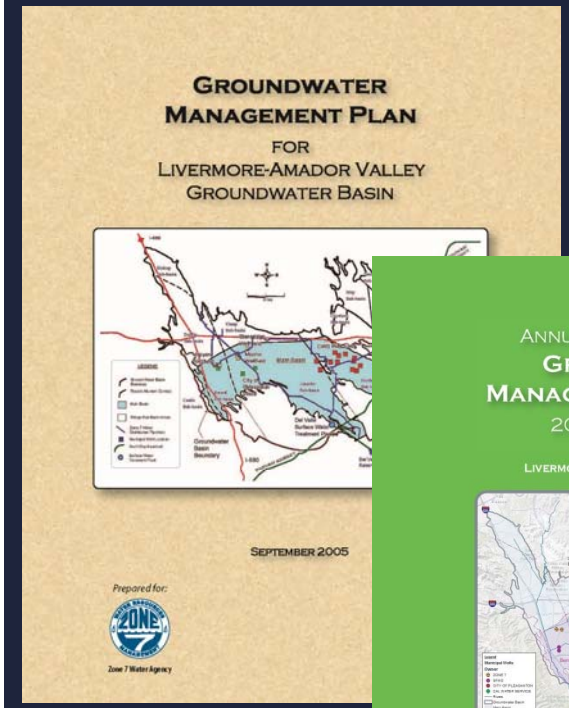


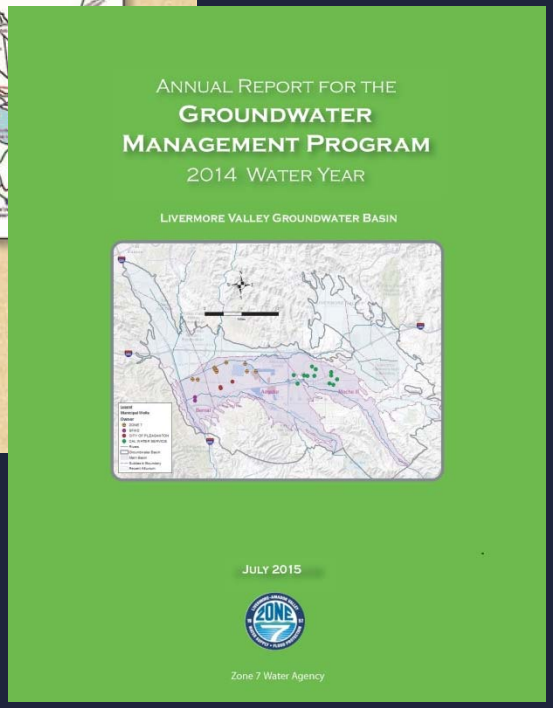
- City of Pleasanton
- Dublin San Ramon Services District
  - Delivering to Dublin and the Dougherty Valley area in southern San Ramon
- City of Livermore
- California Water Service Company

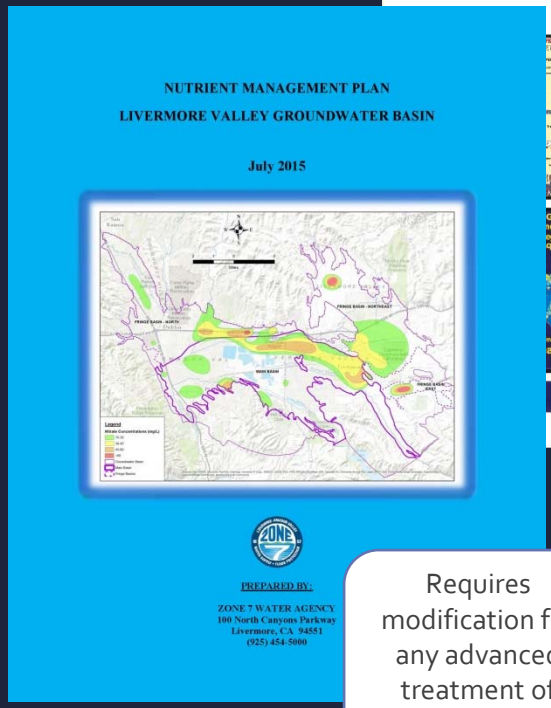
Zone 7 Water Agency Functions

- Flood protection for Eastern Alameda County (425 square miles)
- State Water Project Contractor, importing an average of 48,000 acre feet annually to Valley; remaining demands (averaging 15%) met with local supplies
- Treated water wholesaler (45,000 AFA) for over 220,000 residents and businesses served by:
  - City of Livermore
  - California Water Service Company (portion of Livermore)
  - City of Pleasanton
  - Dublin San Ramon Services District (including Dougherty Valley under special agreement)
- Untreated water supplier (5,000 AFA) for:
  - 74 agricultural & irrigation customers (3,500 acres)
  - Primarily vineyards
  - Local wine industry estimated at $200 million/year
- Sustainable Groundwater Manager (granted local authority in SGMA)
  - 250,000 AF underground basin with 126,000 AF operational storage
- Environmental Stewardship for Watershed Protection

Protecting the Livermore Valley Groundwater Basin



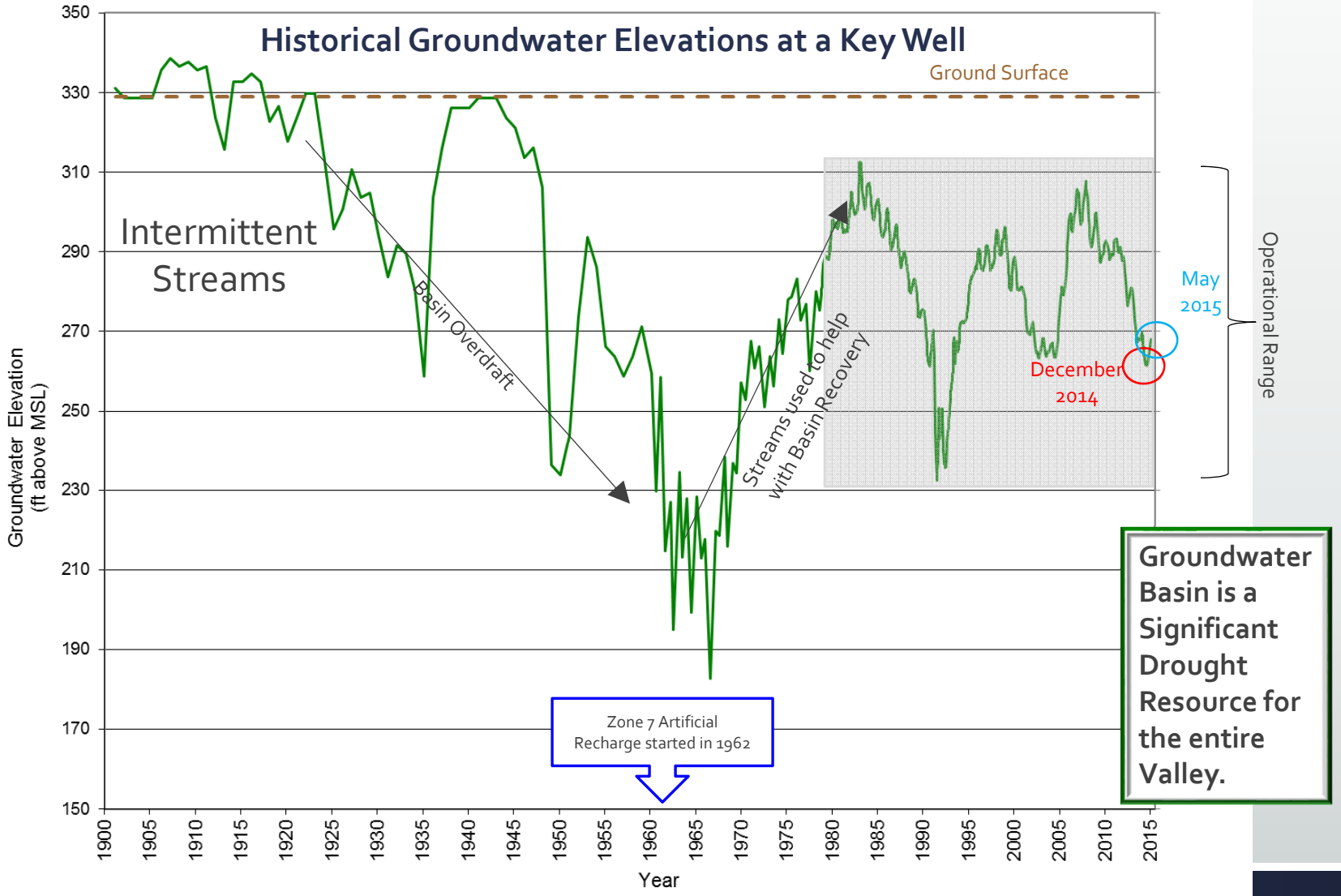




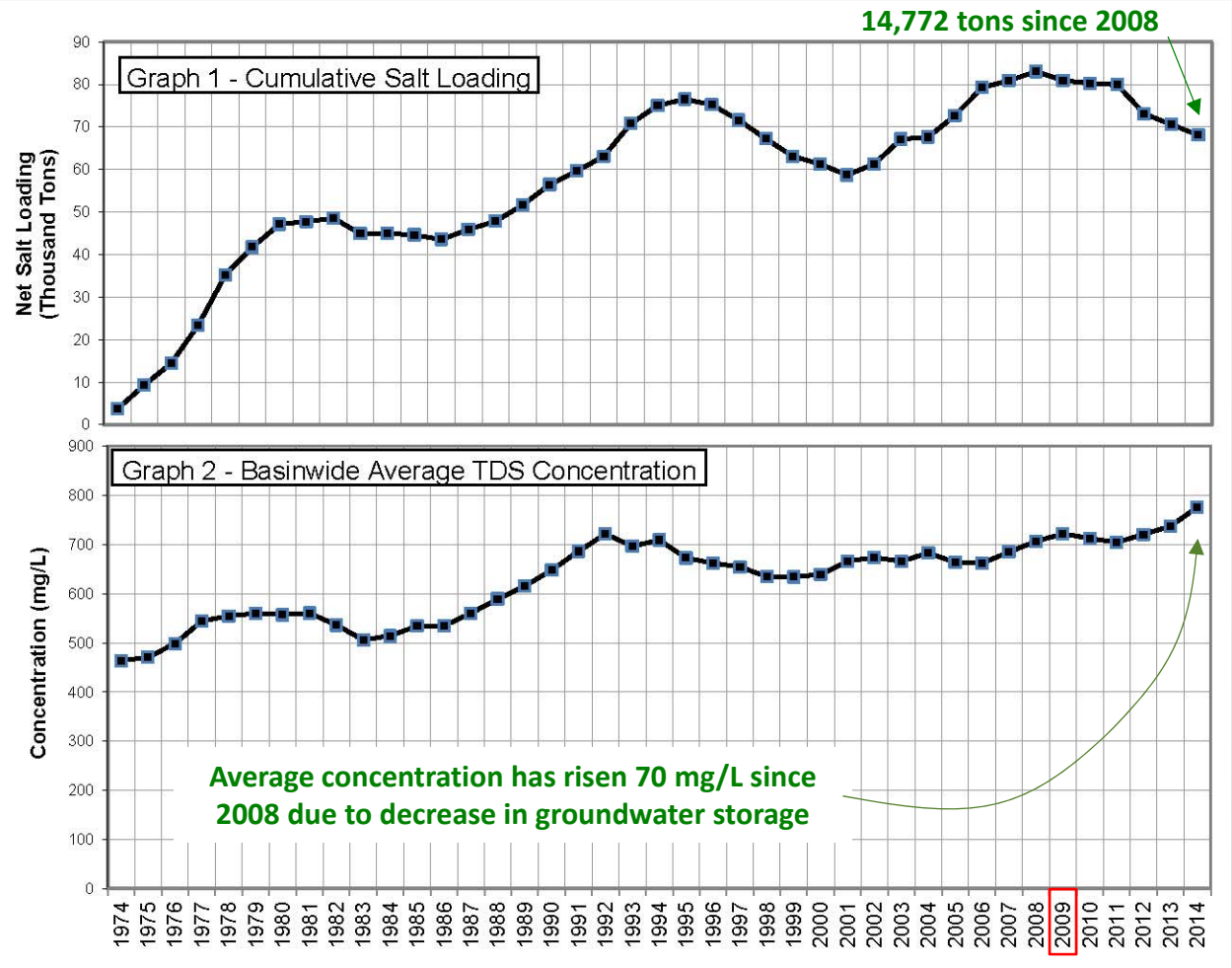
Facilitates the use of Tertiary Recycled Water for irrigation

Requires modification for any advanced treatment of recycled water

Groundwater Quantity



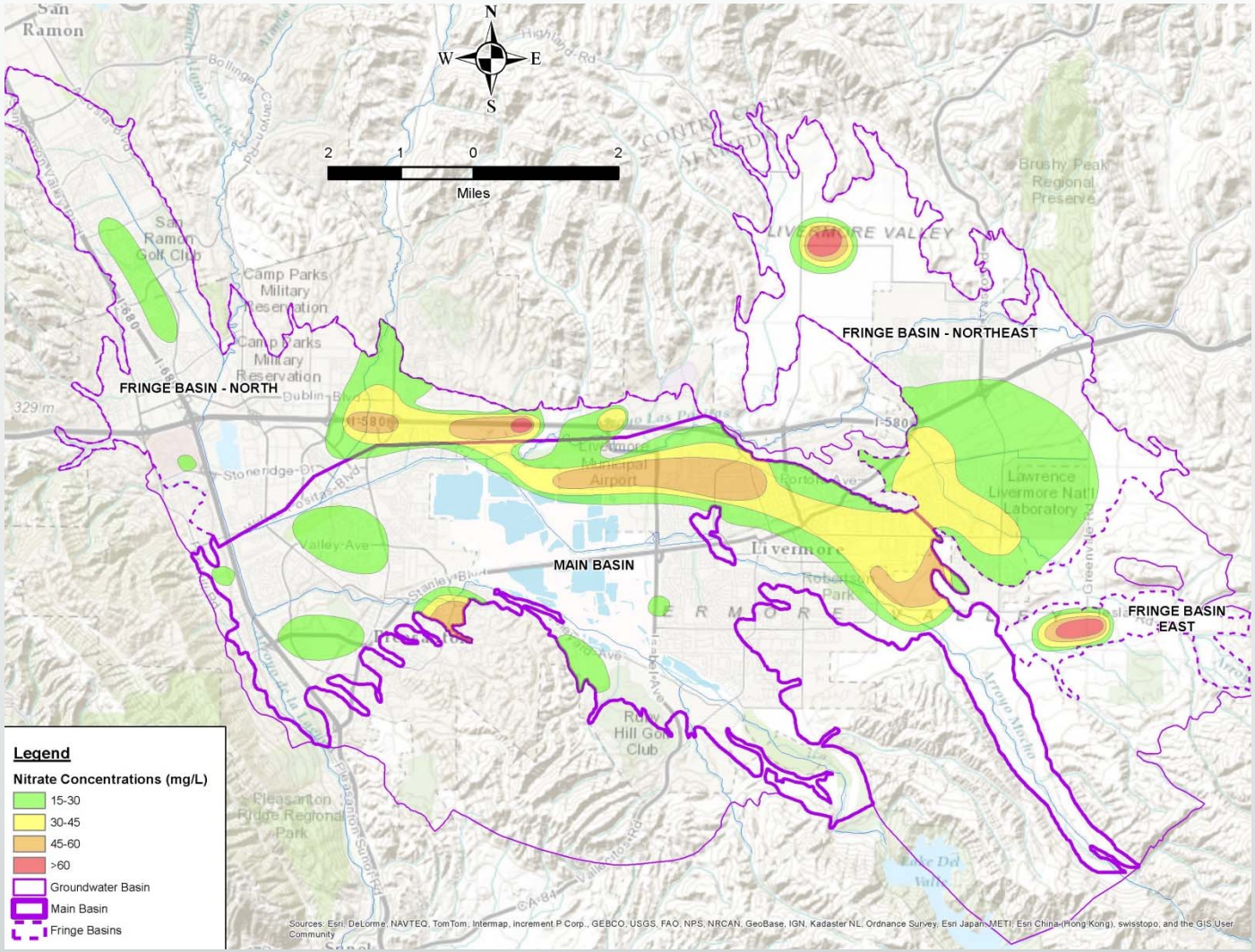
Groundwater Quality – Salt



Management Strategy

- Artificially recharging the basin with low TDS water when available
- Pumping and delivering additional groundwater so more salts are exported as wastewater
- Operating the Mocho Demineralization Facility to remove salts
- Protecting source water quality
- Continuing monitoring of TDS concentrations

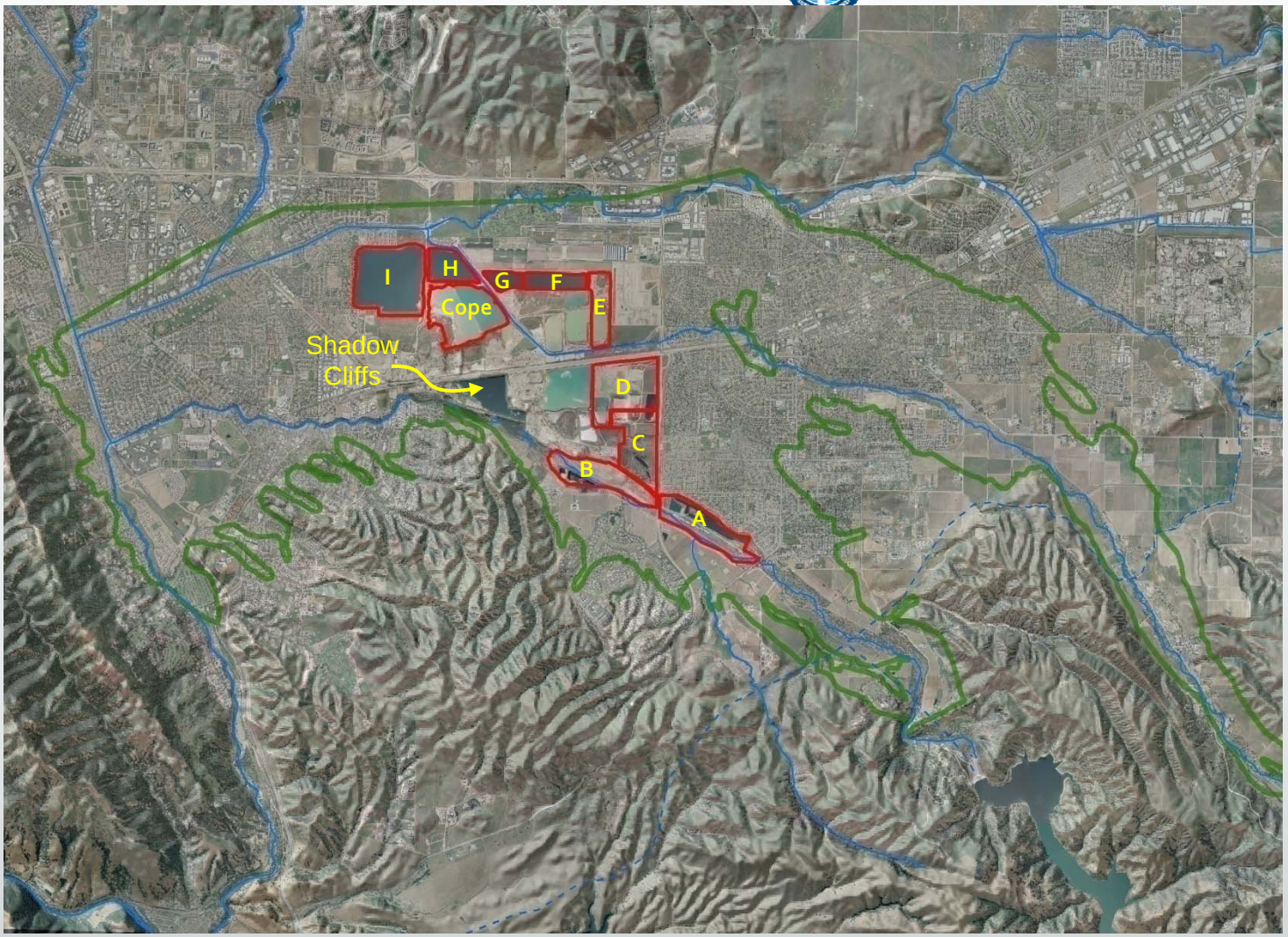
Groundwater Quality - Nutrients



Management Strategy from Salt Nutrient Management Plan

- Increasing understanding of the extend and source(s) of high nitrate concentrations
- Requiring new development projects within the unsewered Areas of Concern to minimize, or when practical, install only new advanced OWTS with nitrogen-reducing treatment
- Continuing monitoring of the nitrate concentrations

Extended Mining in Chain of Lakes Area



- **Shadow Cliffs** – Owned and Operated by EBRPD

- **Chain of Lakes** – Series of gravel pits in active mining since before the 1960's

  - Provide ~100,000 acre-feet of Storage

  - Zone 7 Owns:
    1. Lake I
    2. Cope Lake

  - Lake H – after completion of reclamation

  - Lakes A thru G – completion of mining ~~(2030)~~

2060?

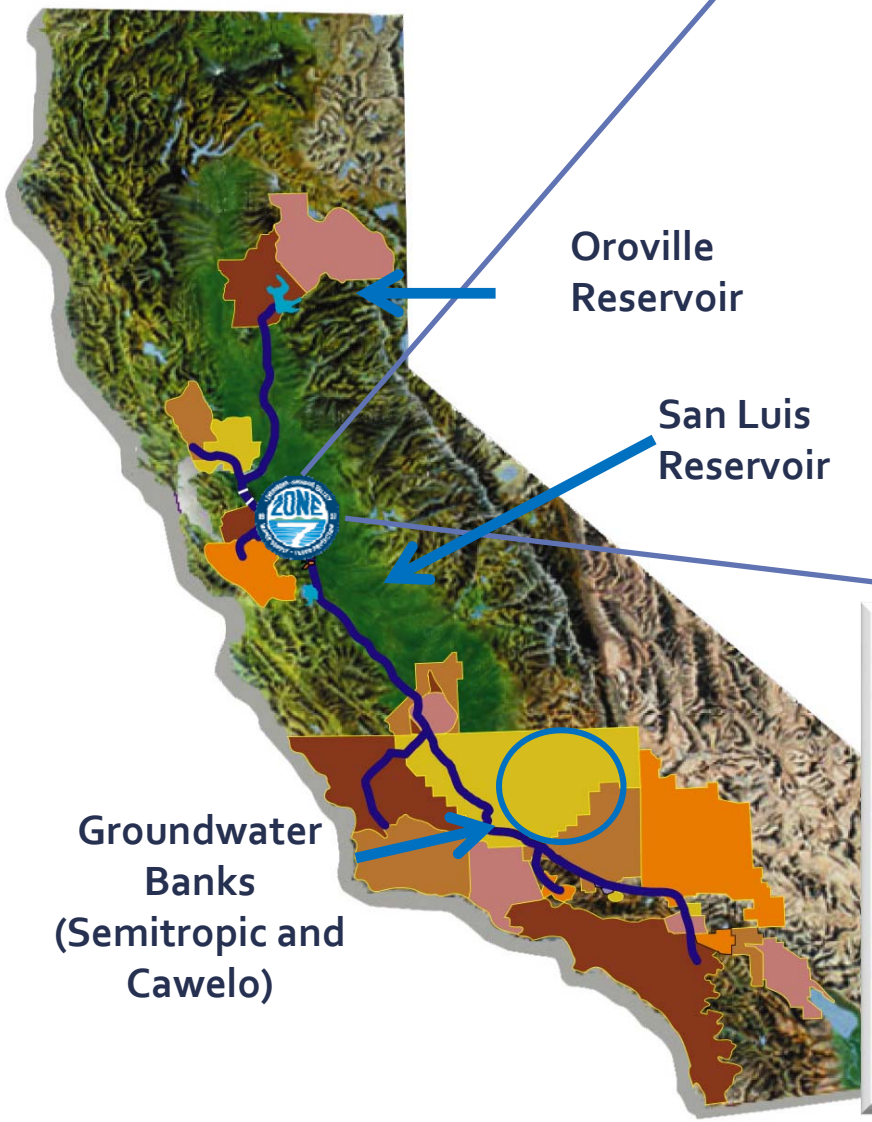
Additional evaporative losses

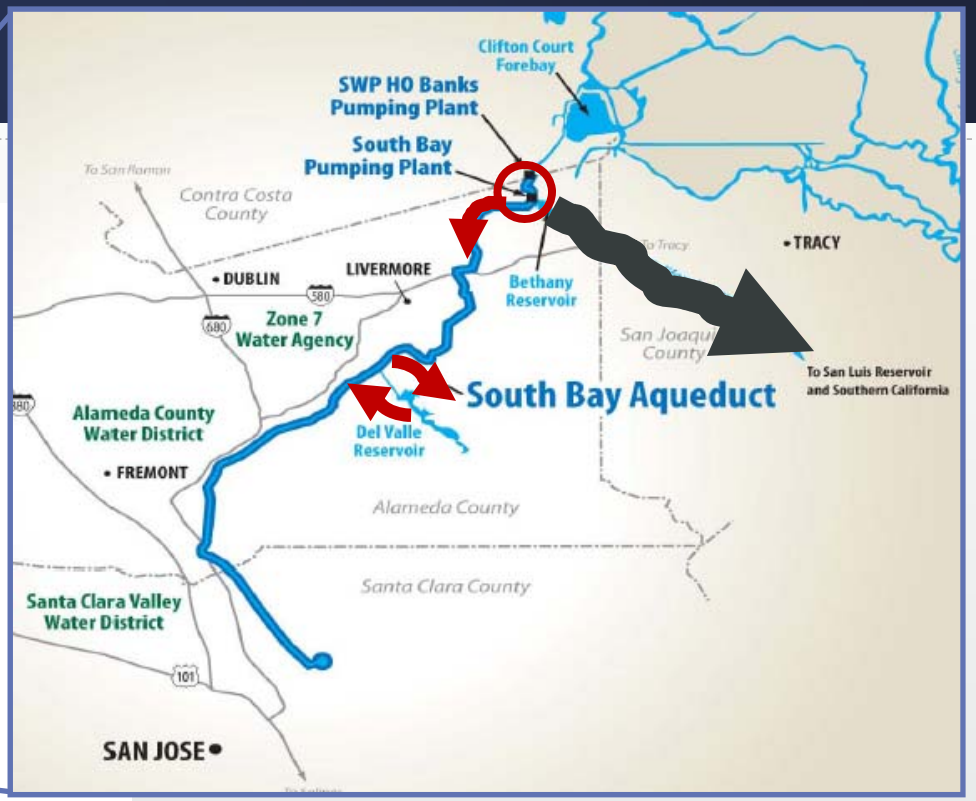
Additional salt loading

Delay in long-term recharge plans

How could potable reuse fit into Zone 7's plan and approach for long-term water supplies?

STATE WATER PROJECT, over 80% of Zone 7's Water Supply





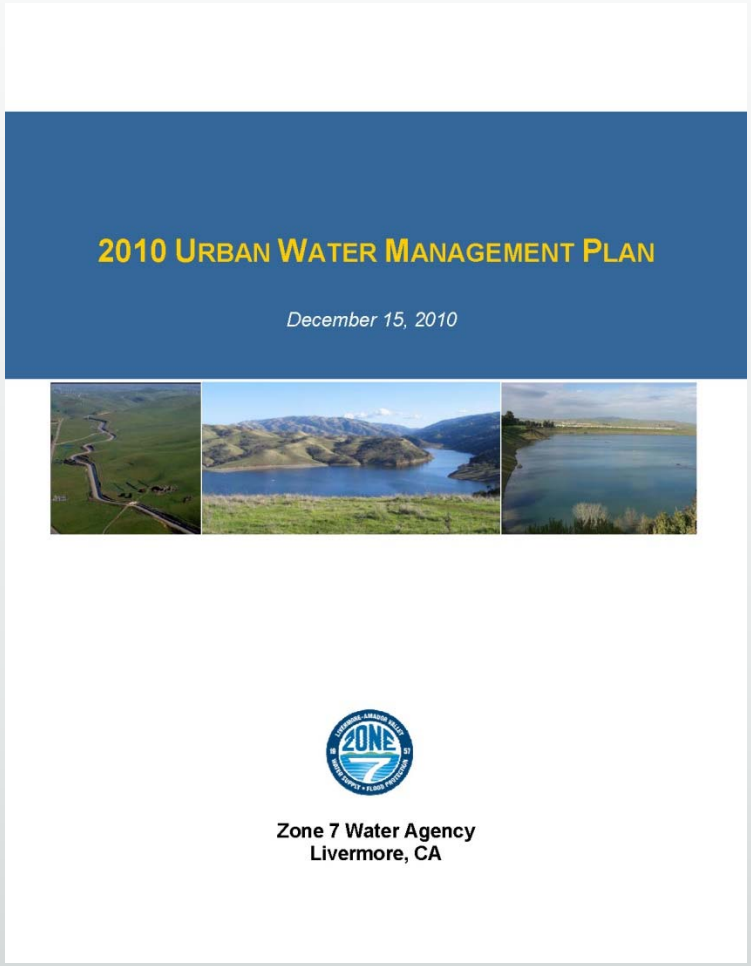
All of Zone 7's Imported Supplies are delivered through the Delta/SBA System:

- Table A
- Carryover
- Dry Year Transfers
- SWP Exchanges
  - Multi-Year Pool
  - Semitropic & Cawelo
- BBID

Many uses:

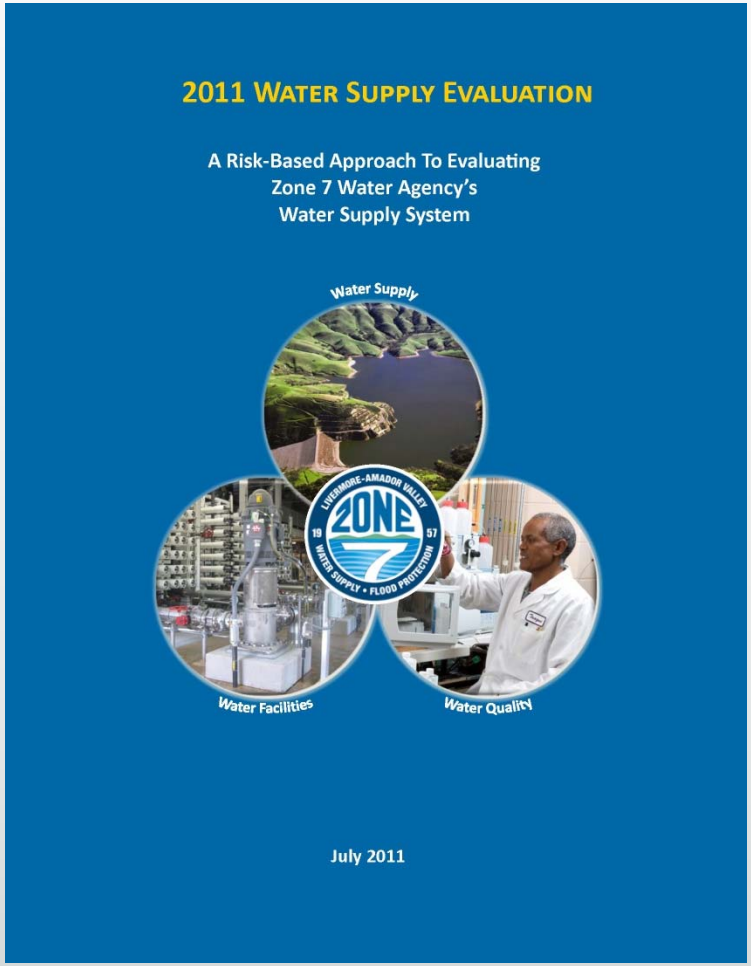
- Deliver to customers
- Recharge local GW Basin
- Carryover in San Luis Reservoir
- Banked in Kern County
- Pilot Los Vaqueros Storage Program

Urban Water Management Plan



- Assesses the reliability of Zone 7's water supplies over a 20-year planning horizon considering normal, dry, and multiple dry years
- First plan completed in 2000, and it is updated every 5 years
- Outlines status of existing water demand management measures
- Identifies planned programs and projects to meet projected water supply shortages
- Defines Zone 7's Water Shortage Contingency Plan
- Last update completed in 2010
- Staff currently working on a 2015 update, due by June 2016

Have been working with our Local Retailers to Develop Robust Analysis for Identifying Most Resilient Future Supply Portfolios



- Provides background for UWMP and agency planning
- Identified over 30 potential water supply options ranging from small grey water and rainfall capture systems to large-scale recycled water systems

- Developed three portfolios: (1) Delta Fix centric; (2) Recycled Water centric; (3) Intertie centric
- Employed risk-based approach for identifying near-term "no regret" actions for moving forward

Have been working with our Local Retailers to Develop Robust Analysis for Identifying Most Resilient Future Supply Portfolios

Currently updating the WSE: expected completion in January 2016

- Provides updated data and background for UWMP, which is due June 2016
- Includes updated SWP Reliability numbers
- Accounts for potential delays in the Chain of Lakes (local storage)
- Evaluates local climate change
  - Important to both water supply & flood protection
- Accounts for Delta outages associated with an earthquake or water quality
- Adds conservatism to availability of drought supply in Kern County
- Employs a Robust Approach
  - 4 Portfolios
  - 8 Scenarios
  - 8 Metrics
  - Each subjected to different hydrologic sequences

HDR hired to review *potential feasible recycled water & desalination options for the benefit of the entire Tri-Valley area*

Preliminary Potential Potable Reuse Options from HDR

Indirect Potable Reuse: might be 4,800 to 7,200 AF per year

- $1,700 to $2,000 per acre-foot
- Percolation via Chain of Lakes (Lake I)

  A much more detailed and robust evaluation of storage capacity, and percolation potential needed to account for groundwater levels, other recharge demands (e.g., stormwater or increased gravel pumping), and the actual timing of acquisition.`
- Injection wells (if even feasible)

  A much more detailed and robust evaluation of the operational feasibility and cost of injection wells is necessary, especially since prior experience by Zone 7 staff indicates that injection may not be feasible within the Livermore-Amador Valley.

Don't forget: blending and discharge requirements (NPDES & EBDA)

Direct Potable Reuse : might be 5,400 to 7,800 AF per year

- Regulations are still under development
- $1,500 to $1,800 per acre-foot
- Treat a blend of advanced treated recycled water and Delta water at PPWTP
- Treat a blend of advanced treated recycled water and Delta water at DVWTP
- Direct connection to potable system

Don't forget: blending and discharge requirements (NPDES & EBDA)

Would potable reuse help?

Potential Advantages:

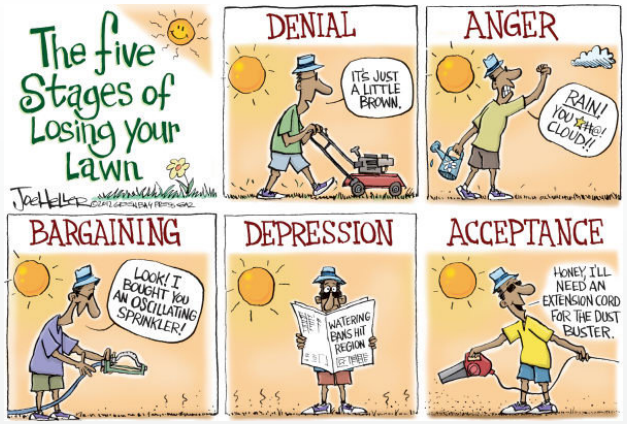
- Might be able to achieve increases in total long-term average supply by as much as 14%
- Increases odds of having more water in the local groundwater basin to help protect against drought or outage of SBA
- More local control

BUT

Cautious Approach

- Exercise due diligence to ensure the health of the public and the local groundwater basin are protected
- Assess public opinion
- Assess water quality impacts to aquifer and distribution systems
- Identify the appropriate number and type of physical or treatment barriers between source water and the end user
- Further evaluate percolation within Chain of Lakes and potential conflicts with flood projection needs
- Thoroughly investigate injection, especially since past attempts were unsuccessful due to local conditions
- Identify Potential environmental impacts and needed mitigation
- Evaluate feasibility of blending and meeting discharge and permitting requirements (i.e., NPDES/EBDA) to better define yields

Working with local retailers on a scope of work for a detailed public polling and feasibility study.



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QUESTIONS?

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