Local Water Supply and Salinity Impacts

Salinity Seminar
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Presentation Overview

• Local Water Supply Situation
• What is salinity?
• What is the problem?
• Why is salinity increasing?
• Who is affected and who contributes to the problem?
• What does the future hold?
• What are the potential solutions?
San Diego Region
Water Supply Update

Governor Proclaims
Statewide Drought -
June 4, 2008

• Critically dry conditions in 2007 and 2008
  - Snowpack water content at 67% of normal
  - Runoff forecast at 55% of normal
  - Driest spring on record in northern California
    - Reservoir levels low - Oroville at 50%
• Largest court-ordered delivery restriction in state history
  - Deliveries from Delta - one-third of allocation
    (Drought impacts and Judge Wanger Ruling on Delta Smelt)
State Water Project
Fish Challenges

• Court ruling imposed interim restrictions on SWP pumping to protect Delta smelt (threatened)
  - In CY 2008, 500,000+ AF lost to SWP; another 300,000+ AF loss to CVP to date.
• Potential for additional pumping restrictions
  - Longfin Smelt (designated candidate species)
    • 12-month review starting July 2008.
  - Central Valley Steelhead/Chinook Salmon (w/s)
    • Wanger ruling in April 2008 invalidated Biological Opinion.

Colorado River Hydrologic Conditions

• 2007 was 8th year of historic drought
  - 2003: surplus water no longer available
  - CRA half-full
• 2008 above average
  - 117% of normal snow pack
• Reservoirs are at ~50%
  - 60 MAF
  - Will take many years to refill
San Diego Supply Situation - 2008

- 30% cutbacks to Interim Agricultural Water Customers in 2008
- Region likely to avoid municipal and industrial cutbacks from MWD this year
- The region has entered a multi-year era of:
  - Diminished core imported water supplies
  - Increased reliance on water supply reserves
  - Increased vulnerability to weather changes

What is Salinity?

- Measured as Total Dissolved Solids or Electrical Conductivity
- Ions Dissolved in Water
  - Calcium, Magnesium, Sodium, Potassium, Bicarbonate, Sulfate, Chloride, Nitrate, Bromide
What is the Problem?

- Salt is accumulating in soils
- Salinity is increasing in surface waters
- Salinity is increasing in groundwater
- High salts limit the ability to beneficially use water in the San Diego Region

Why is Salinity Increasing?

- Salinity increases from upstream to downstream due to water diversions, consumptive use, and discharges.
- Salt is exported out of the Sacramento/Bay Delta/Colorado River Basins.
- Changes in our imported water supply mix effect salinity levels.
Who is Affected and Who Contributes to the Problem?

- Residential Users
- Industry
- Agriculture
- Wetlands
- Drinking Water, Wastewater Agencies
Residential Users

• Effects
  - Objectionable taste in drinking water
  - Bottled water or home treatment devices purchased
  - Health impacts - sodium and nitrate
  - Corrosion or build-up in pipes and appliances

• Salt Contributions
  - Water consumption
  - Water softeners and garbage disposals
  - Fertilizers and soil amendments
  - Personal care and cleaning products
  - Salt residuals in irrigated landscapes

Industry

• Effects
  - Increased pretreatment
  - More stringent discharge requirements

• Salt Contributions
  - Discharges to surface waters and groundwaters
  - Brine discharges to sewer system
Agriculture

• Effects
  – Limits crop production
  – Salt tolerant crops
  – Land falling

• Salt Contributions
  – Crops use water and leave salts behind
  – Fertilizers and soil amendments
  – Drainage contains more salt than irrigation water

Wetlands

• Salt Contributions
  – Water evaporates and salts are concentrated
  – High salinity water is discharged to surface waters or groundwater
Drinking Water and Wastewater Agencies

- **Effects**
  - More advanced treatment
  - Limits ability to recycle wastewater and recharge groundwater (increased use and development of groundwater and recycled water supplies key strategies to diversify San Diego’s Water Supply Portfolio)
  - More stringent discharge requirements for wastewater dischargers

- **Salt Contributions**
  - TDS increases by about 300 to 500 mg/L between source water and wastewater

What Does the Future Hold?

- **MORE SALT**
- Increased regulation
- Population Growth
  - More water diversions
  - More discharges

- **Climate Change**
  - Less snow and more rain = more difficulty capturing high quality water for later use
  - More demand for local supplies
What are the Potential Solutions?

- **Short-term**
  - Actions to improve water quality in the Bay/Delta, Colorado river
  - Management practices

- **Long-term**
  - Peripheral canal or other conveyance to improve quality of water pumped from Delta
  - Drain or brine line to the ocean
  - Desalination facilities

Summary

- Large amounts of salt are imported into the San Diego region.
- High salts limit the ability to beneficially use water
- Consumptive use of water increases salinity.
- It is imperative that we develop a salt management plan and address this problem.
- We (individuals, urban, agriculture, industry) are all part of the problem and we must work together to address salinity in the San Diego Region.
Progress May Be Slow But We Don’t Have a “No Action” Alternative