Water Storage and Conveyance 101

Outline

1. Tri-Valley’s Water Supplies
2. The State Water Project System
3. Conveyance of Imported Water
4. Zone 7’s Storage System
Tri-Valley Water Supplies

- Most of the region’s water supply served by Zone 7 and the retailers is imported, not local
- Currently, about 70% of the supply comes from the State Water Project (SWP) via the Delta
- Recycled water for irrigation supplies about 10%
- Zone 7 stores excess imported surface water in the local groundwater basin, remote groundwater banks in Kern County, and in San Luis Reservoir
- Zone 7 provides about 80% of the supplies served to the region

Sources of Supplies

- State Water Project (Zone 7)
- Amory Valle (Zone 7)
- Groundwater Quotas (Retailers)
- Recycled Water (DSRSD/Livermore)

State Water Project (SWP) System

- SWP System
  - Delivers the year’s “Table A” allocation
  - Other SWP water
  - Other water, when capacity is available
- 29 SWP Contractors:
  - 23 Mostly Urban
  - 6 Mostly Agricultural
- Water Supply Contracts
  - 4,200,000 AF in Table A amounts
  - Zone 7: 2% of the SWP
Conveyance of Imported Water
Conveyance of Imported Water

The California Aqueduct conveys water to SWP contractors in central and southern California. It also conveys excess Zone 7 water to Kern County to “bank” for future use.

- South Bay Aqueduct (SBA) conveys:
  - Water to treatment plants,
  - Water to agricultural customers,
  - Releases to the arroyos.

- Currently, conveyance to Zone 7 is limited to SBA.
- Capital Improvement Program includes new conveyance projects.
Zone 7’s Storage System

Existing Storage System

- Chain of Lakes:
  - Lake I
  - Cope Lake

- Local Groundwater Basin (Main Basin)

- San Luis Reservoir

- Sacramento

- Bakersfield

- San Francisco

- San Jose

- South Bay Aqueduct

- Cawelo Water District
### Zone 7’s Storage System

**Above-ground: surface water reservoirs**

<table>
<thead>
<tr>
<th></th>
<th>OWNED BY DWR:</th>
<th>OWNED BY ZONE 7:</th>
</tr>
</thead>
<tbody>
<tr>
<td>San Luis Reservoir</td>
<td>San Luis Reservoir</td>
<td>Lake Del Valle</td>
</tr>
<tr>
<td>Lake Del Valle</td>
<td></td>
<td>Lake I</td>
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<tr>
<td>Lake I</td>
<td>Lake I</td>
<td>Cope Lake</td>
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<tr>
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</tbody>
</table>

#### Storage Zone 7’s Operational Storage (acre-feet) Current Storage Amount (acre-feet)

<table>
<thead>
<tr>
<th>Storage</th>
<th>Zone 7’s Operational Storage (acre-feet)</th>
<th>Current Storage Amount (acre-feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>San Luis Reservoir</td>
<td>10,000-15,000</td>
<td>10,000</td>
</tr>
<tr>
<td>Lake Del Valle</td>
<td>7,500</td>
<td>8,500</td>
</tr>
<tr>
<td>Lake I</td>
<td>10,800 (26,800 total)</td>
<td>20,500</td>
</tr>
<tr>
<td>Cope Lake</td>
<td>4,500</td>
<td>4,400</td>
</tr>
</tbody>
</table>

### How do the reservoirs get filled?

**Above-ground: surface water reservoirs**

- **San Luis Reservoir**
  - Water pumped from the Delta, into the California Aqueduct, and diverted to San Luis Reservoir
  - Water stored via paper exchange

- **Lake Del Valle**
  - Arroyo Valle flows directly into Lake Del Valle, collecting water from upstream watershed
  - DWR pumps Delta water into the lake

- **Lake I**
  - Fills with groundwater and rainwater
  - Mine water recaptured in Cope Lake then conveyed to Lake I

- **Cope Lake**
  - Vulcan mine water pumped into Cope Lake
  - Fills with rainwater
Zone 7’s Storage System

Below-ground: groundwater aquifers

**MANAGED BY ZONE 7:**
- Livermore Valley Groundwater Basin

**KERN COUNTY GROUNDWATER BANKS:**
- Semitropic Water Storage District
- Cawelo Water District

<table>
<thead>
<tr>
<th>Storage</th>
<th>Zone 7’s Operational Storage Capacity (acre-feet)</th>
<th>Current Storage Amounts (acre-feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Livermore Valley Groundwater Basin (&quot;Main Basin&quot;)</td>
<td>126,000 (+128,000 of emergency storage)</td>
<td>251,000</td>
</tr>
<tr>
<td>Kern County Groundwater Banks:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Semitropic Water Storage District</td>
<td>78,000</td>
<td>86,000</td>
</tr>
<tr>
<td>Cawelo Water District</td>
<td>120,000</td>
<td>26,400</td>
</tr>
</tbody>
</table>

How does the Main Basin get filled?

Water fills the spaces between the sand, gravel, etc.
Groundwater Banks

What is the purpose of groundwater banking?

- Groundwater banking is part of normal operations, providing a buffer against variable supply conditions.
- The amount of water provided by the SWP each year currently averages 50%.
- In years when we have extra water (usually wetter conditions), we bank the extra water.
- In years when we do not have enough incoming supplies (drier conditions), we withdraw water from the banks.

Groundwater Banks

How do the banks get filled?

Zone 7’s surface water is conveyed via the California Aqueduct south to Kern County...

- “In-lieu exchange”: farmers then use our surface water and leave groundwater in the aquifer to add to our bank account, and/or
- Surface recharge: surface water is placed in spreading ponds or recharge basins, goes into the aquifer, and is deposited to our account.
Groundwater Banks

How do we withdraw our water from the banks?

- We do not pump water from south to north.
- Water withdrawal from banking programs is done through “exchanges”.
- A similar approach is used for San Luis Reservoir
  - We intercept water in the Delta then DWR reduces our balance of water in San Luis Reservoir.

Kern County Groundwater Banks

- MWD’s water pumped from the Delta and delivered to Zone 7
- Zone 7’s groundwater in Kern County pumped into the CA Aqueduct
- MWD receives water from the California Aqueduct, inc. pumped groundwater.
- A similar approach is used for San Luis Reservoir
- We intercept water in the Delta then DWR reduces our balance of water in San Luis Reservoir.
Chain of Lakes

Owned by Zone 7

Complete Chain of Lakes by ~2060:
+ 120,000 AF total storage
+16,000 AF operational storage

QUESTIONS?