SLIDES: Status of Southern Nevada Water Authority (SNWA): Third Intake into Lake Mead and Groundwater Project

Kay Brothers

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Status of Southern Nevada Water Authority (SNWA)

Third Intake Into Lake Mead and Groundwater Project

Kay Brothers, Deputy General Manager

Southern Nevada Water Authority
Colorado River Basin

- ~15 mafy average runoff
- 60 maf of storage
- The U.S. Bureau of Reclamation serves as water master
Colorado River Overview

The Colorado River was allocated in 1922.

- The Upper and Lower basins were each allocated 7.5 mafy.
- At that time, uses were relatively comparable.
The Lower Basin allocated its Colorado River water to the states based on population and agricultural potential.
Nevada receives 300,000 acre-feet of Colorado River water annually; resources are diverted through facilities at Lake Mead.

- Nevada: 300,000
- Arizona: 2.85 million
- New Mexico: 850,000
- Utah: 1.7 million
- Wyoming: 1 million
- Colorado: 3.9 million
- California: 4.4 million
Population in the Lower Basin has grown substantially since the 1920s.

Significant growth occurred in Southern Nevada.
Southern Nevada has reached a population over 2,000,000.
Changes in Southern Nevada

Water demands shifted from “no projected use of Colorado River” to heavily reliance.
Changes in Southern Nevada

In the 1990’s Southern Nevada hit a crisis point: additional water was needed to meet growing demands.

Population

- 1950 – 47,000
- 1960 – 116,000
- 1970 – 270,000
- 1980 – 444,000
- 1990 – 800,000
Changes in Southern Nevada

- **Competition for Colorado River water**
  - Water agencies were operating independently – no coordination of resources, demands, etc.
  - Each agency was negotiating its own best deal for future supplies with the Colorado River Commission – “every-man-for-himself.”

- **No coordinated conservation plan**
  - There was no incentive to save water - agencies were allocated water based on the prior year’s use – the more they used, the more they got.
  - If an agency used less than its allocated amount, its water share was reduced accordingly.
The Southern Nevada Water Authority was formed in 1991 to address Southern Nevada’s unique water needs on a regional basis.

Each agency, regardless of size, has an equal voice and tackled issues collaboratively for the benefit of the whole.
Changes in Southern Nevada

- The SNWA provides regional coordination of water resources
  - Secure new water resources
  - Maximize existing water resources
  - Build and operate regional water facilities
  - Promote conservation
Changes in Southern Nevada

Paradigm Shift / mid 1990s

- Changed from a water accounting process to a water management process
- Utilize temporary and permanent supplies
- Create a portfolio of resource options to meet future needs
- Manage water supplies through a water resource plan that is reviewed annually and amended as necessary
In the meantime, the region continued to expand…

… and drought struck the Colorado River with force.
Colorado River Drought

The recent 9-year historical average inflow to the Colorado River system was 66% of normal.
Colorado River Drought

Lake Mead storage has been reduced by half.

Lake Powell Storage

- Jan. 2000: 88% in Storage
- Jan. 2009: 55% in Storage

Lake Mead Storage

- Jan. 2000: 96% in Storage
- Jan. 2009: 49% in Storage

Colorado River Drought

Lake Mead storage has been reduced by half.
Southern Nevada depends on the Colorado River to meet 90% of its water resource needs.
Colorado River Drought

Hoover Dam, Lake Mead 1983

Hoover Dam, Lake Mead 2009

SOUTHERN NEVADA WATER AUTHORITY
snwa.com
Lake Mead water levels have dropped to record lows.

These conditions have and will continue to drive a number of water management decisions.
The SNWA could lose facility and supply access if drought conditions continue.
Las Vegas Bay
Boulder Basin
Hoover Dam
Saddle Island

<table>
<thead>
<tr>
<th></th>
<th>Elevation</th>
<th>Elevation</th>
<th>Percent Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boulder Basin</td>
<td>7.248</td>
<td>5.510</td>
<td>24.0%</td>
</tr>
<tr>
<td>Las Vegas Bay</td>
<td>0.971</td>
<td>0.530</td>
<td>45.4%</td>
</tr>
<tr>
<td>Inner Las Vegas Bay</td>
<td>0.018</td>
<td>0.002</td>
<td>87.9%</td>
</tr>
<tr>
<td><strong>TOTALS</strong></td>
<td><strong>8.24</strong></td>
<td><strong>6.042</strong></td>
<td><strong>26.6%</strong></td>
</tr>
</tbody>
</table>

* Units are millions Acre Feet
1100 Feet

Volumes in acre/feet
Boulder Basin—4,546,728
Las Vegas Bay—346,747
1000 Feet

Volumes in acre/feet
Boulder Basin—2,670,555
Las Vegas Bay—100,554
Conservation was Southern Nevada’s first response to drought.

2003: Implemented drought plan
2004: Realized goal of 25% conservation
2005: Adopted a new conservation goal
2008: Realized conservation goal of 250 GPCD
2009: Adopted a new conservation goal
   (199 GPCD by 2035)

Southern Nevada’s annual water consumption decreased by nearly 21 billion gallons between 2002 and 2008, despite a population increase of 400,000 during that span.
Southern Nevada has one of the most aggressive conservation programs in the Nation.

SNWA Response

- Time of day and day of week watering restrictions
- Landscape development codes
- Golf course water budgets
- Water waste restrictions & penalties
- Water Smart Landscapes Program
- Water Efficient Technologies Program
- Pool Cover Rebate program
- Water Smart Home Program
- Irrigation Clock Rebate program
- Water Smart Car Wash Program
- Water Smart Contractor Program
- H20 University
- Demonstration Gardens

But, Conservation alone will not protect Southern Nevada from drought.
SNWA Response

Lake Mead could decline below SNWA’s upper intake by as early as 2013 if drought conditions persist (69% runoff).

Further lake level declines could impact our ability to access Colorado River resources altogether.
SNWA Response

Water Treatment Facility

Intake Shaft

Pumping Station

Access Shaft

Intake Tunnel

Discharge Pipeline

Intake No. 2 Connection

Saddle Island
SNWA Response

March 2009 Concept

Existing Intake Features
Proposed Intake No. 3 Features

Lake Mead

IPS-2 Isolation Gate
IPS-3 Forebay
IPS-1 Interconnection
Lake Mead

Boulder Harbor

Saddle Island

Elev. 1000’ IPS-2 Riser Plug
Elev. 1050’ (1,000)

IPS-2 Connection and Modifications
IPS-2 Isolation Gate

Interconnection

To RMWTF
To AMSWTF

To AMSWTF

To AMSWTF

~ 3 miles

Existing Intake Features
Proposed Intake No. 3 Features
### SNWA Response

#### Project Timeline

**Current Projects (advertised or awarded costs)**

<table>
<thead>
<tr>
<th>Project</th>
<th>Cost</th>
<th>Completion Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intake No. 3 Shafts and Tunnel</td>
<td>$447 mil</td>
<td>2012</td>
</tr>
<tr>
<td>Intake No. 2 Connection/Modifications</td>
<td>$30 mil</td>
<td>2010</td>
</tr>
<tr>
<td>Intake No. 3 Connector Tunnel</td>
<td>$50 mil (est)</td>
<td>2012</td>
</tr>
</tbody>
</table>

**Future Projects (scope, cost and schedule to be evaluated)**

<table>
<thead>
<tr>
<th>Project</th>
<th>Cost</th>
<th>Completion Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intake No. 3 Pumping Station</td>
<td>$160 mil (est)</td>
<td>TBD</td>
</tr>
<tr>
<td>Quagga Control System</td>
<td>$25 mil (est)</td>
<td>TBD</td>
</tr>
<tr>
<td>Substation and Permanent Power Supply</td>
<td>$8 mil (est)</td>
<td>TBD</td>
</tr>
<tr>
<td>Discharge Pipeline</td>
<td>$25 mil (est)</td>
<td>TBD</td>
</tr>
</tbody>
</table>
To ensure a reliable water supply, the SNWA is pursuing development of additional non-Colorado River water resources.

These resources are in the form of unused groundwater supplies in eastern Nevada.
Clark, Lincoln & White Pine Counties Groundwater Development Project

Proposed Facilities

- Groundwater wells
- Pipelines
- Pumping stations
- Regulating tanks
- Water treatment facilities
- Power lines/facilities
- Support facilities
The SNWA will have 20 years of study and monitoring before any water comes to Southern Nevada.
Development of these in-state resources will:

- Diversify available water resources to meet near and long-term demands (reduce dependence on Colorado River from 90% today).

- Ensure resources are available if Colorado River shortages are instituted or resources become inaccessible due to low lake levels.

<table>
<thead>
<tr>
<th></th>
<th>Amount Permitted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spring Valley</td>
<td>60,000 AFY permitted, subject to staged pumping restrictions.</td>
</tr>
<tr>
<td>Delamar, Dry Lake &amp; Cave Valleys</td>
<td>18,755 AFY permitted.</td>
</tr>
<tr>
<td>Snake Valley</td>
<td>Applications pending.</td>
</tr>
</tbody>
</table>
The Seven Basin states have worked over the last decade to implement innovative water solutions for the Colorado River.

- Rules for Surplus
- Banking arrangements
- Shortage sharing
- Shared facilities
- Coordinated management
- Augmentation
Colorado River Basin Response

The States continue to study options for augmenting Colorado River supplies.

Augmentation Study Options:

- Brackish and Ocean Water Desalination
- Coalbed Methane Produced Water
- Conjunctive Use
- Power Plants – Reduce Consumptive Use
- Reservoir Evaporation Control
- Stormwater Storage
- Vegetation Management
- Water Imports Using Ocean Routes
- Water Reuse
- Weather Modification
- River Basin Imports