Meeting Demands in Drought: Southern Nevada’s Example

Colby Pellegrino, Director of Water Resources
Southern Nevada Water Authority
The Southern Nevada Water Authority supplies water to 7 of every 10 Nevadans.
Southern Nevada is nearly fully reliant on the Colorado River to meet the community’s water demands.
Historical and Future Projected Lake Mead End-of-December Elevations\textsuperscript{1,2}

1 Median Interim Guidelines FEIS from June 2007 CRSS projections using 100 hydrologic inflow sequences based on resampling of the observed natural flow record from 1906-2005.

2 “Full” Hydrology from April 2018 CRSS projections modeled using 110 hydrologic inflow sequences based on resampling of the observed natural flow record from 1906-2015.
Historical and Future Projected Lake Mead End-of-December Elevations

- **Historical Elevations**
- **Adoption of 2007 Interim Guidelines**
- **Surplus Conditions**
- **Median Interim Guidelines FEIS**
- **Full Hydrology**
- **Normal or ICS Surplus Conditions (62% Capacity)**
- **Level 1 Shortage Condition (37% Capacity)**
- **Level 2 Shortage Condition (29% Capacity)**
- **Level 3 Shortage Condition (23% Capacity)**
- **Plausible future elevation with 2001 – 2008 hydrology (average = 11.9 MAF/year)**

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Southern Nevada has spent decades preparing for drought to ensure the reliability of water supplies for Southern Nevada.

**WATER BANKING**
Storing water supplies for the future

**RESOURCE PLANNING**
Working with partners & developing comprehensive plans to manage supplies

**CONSERVATION**
Incentives, programs, regulation & pricing

**INFRASTRUCTURE**
Constructing major facilities and asset management
Southern Nevada has banked approximately 1.8 million acre-feet for future use.
Southern Nevada’s conservation program promotes the efficient use of water resources and relies on four key tenets:

**REGULATIONS**
Development codes, watering restrictions and other local ordinances help keep the use of water efficient.

**PROGRAMS**
Incentive programs offer rebates for water-saving technologies and practices, such as car washes, landscape removal and pool covers.

**PRICING**
Local purveyors establish water rates that send conservation signals, but remain competitive among similarly-sized western cities.

**EDUCATION**
Tools such as the Speakers Bureau program, Youth Advisory Council, websites, publications, social media and public access TV show help reinforce messaging.
CONSERVATION PROGRESS REPORT

SINCE 2002

Southern Nevada POPULATION UP 41%
Per Capita WATER USE DOWN 38%
Colorado River Water CONSUMPTION DOWN 28%
Nevada’s Colorado River Water Use

Acre Feet per Year

- 2000: 325,000
- 2001: 325,000
- 2002: 325,000
- 2003: 250,000
- 2004: 200,000
- 2005: 150,000
- 2006: 100,000
- 2007: 50,000
- 2008: 0
- 2009: 0
- 2010: 0
- 2011: 0
- 2012: 0
- 2013: 0
- 2014: 0
- 2015: 0
- 2016: 0
- 2017: 0
Intake No. 3 ensures system capacity and protects customers from water quality issues.

Operations began September 2015.

Project details:
- 2.5 mile tunnel underneath Lake Mead
- Approximately 2,400 concrete rings—each weighing more than 32 tons—used to line tunnel
- Elevation 860 feet
- Cost: $817 million
Construction has begun on a new Low Lake Level Pumping Station near Lake Mead.

When completed, the pump station will ensure water deliveries down to 875 feet.

Estimated cost: $650 million
Isn’t that enough????

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Nevada loses a portion of its Colorado River allocation as lake levels drop.

<table>
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<tr>
<th>Lake Elevation (ft)</th>
<th>Consumption Amount (AFY)</th>
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<tr>
<td>1,076+</td>
<td>300,000</td>
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<td>1,025</td>
<td>280,000</td>
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<td>1,000 and below</td>
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<th>2017 Lake Elevation (ft)</th>
<th>2017 Consumption Amount (AFY)</th>
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<tr>
<td>1,076</td>
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Bureau of Reclamation projects Lake Mead faces a 35% risk of falling below 1,000 feet in 2026.

What happens at 1,000 feet?

- Lake Mead is holding 17% of its capacity
- Community loses access to two intakes; only Intake No. 3 remains operable
- Limited ability to meet demands of Arizona, California and Mexico
- Hoover Dam’s ability to generate hydropower reduced
If Lake Mead reaches elevation 1,000 feet, there is *less than 4.5 million acre-feet of water in storage* to meet the downstream demands of Arizona, California, and Mexico.

Without proactive action, maintaining that elevation could require *between 2.0 and 6.0 million acre-feet* of reductions in a single year.
DROUGHT RESPONSE

Colorado River users continue meetings, with the goal of protecting Lake Mead’s elevations.

• **SYSTEM CONSERVATION**: Incentivize conservation to protect Lake Mead’s elevations

• **DROUGHT CONTINGENCY PLANNING**: Voluntarily reduce water use in Lower Basin to protect Lake Mead’s elevations
Investments in conservation have slowed Lake Mead’s decline.

DROUGHT RESPONSE | System Conservation

1,079 ft: Today’s elevation

1,050 ft: Lake elevation without conservation activities
Once finalized, the Drought Contingency Plan aims to:

– Protect Lake Mead’s elevations from falling below 1,020 feet
– Implement voluntary reductions in water use beyond those required by the 2007 Interim Guidelines
  • Includes a commitment by the U.S. to work to create or conserve Colorado River system water
– Permit recovery of additional reduction volumes under certain conditions
– Incentivize ICS creation/storage

Lower Basin States are working together to mitigate risks.
### Proposed voluntary reductions would be tied to Lake Mead’s elevations

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Risk of Lake Mead reaching 1,000’ in any month

Full Hydrology (1906-2015)
- Risk assessed at the adoption of the 2007 Interim Guidelines; 1906-2005 hydrology
- April 2018: No DCP (official run)
- April 2018: Lower Basin DCP & Binational WSCP
- April 2018: Upper Basin DCP & Lower Basin DCP & Binational WSCP

Stress Test Hydrology (1988-2015)
- Risk assessed at the adoption of the 2007 Interim Guidelines; 1906-2005 hydrology
- April 2018: No DCP
- April 2018: Lower Basin DCP & Binational WSCP
- April 2018: Upper Basin DCP & Lower Basin DCP & Binational WSCP
Risk of Lake Powell reaching 3,490’ in any month

Full Hydrology (1906-2015)
- Risk assessed at the adoption of the 2007 Interim Guidelines; 1906-2005 hydrology
- April 2018: No DCP (official run)
- April 2018: Lower Basin DCP & Binational WSCP
- April 2018: Upper Basin DCP & Lower Basin DCP & Binational WSCP

Stress Test Hydrology (1988-2015)
- Risk assessed at the adoption of the 2007 Interim Guidelines; 1906-2005 hydrology
- April 2018: No DCP
- April 2018: Lower Basin DCP & Binational WSCP
- April 2018: Upper Basin DCP & Lower Basin DCP & Binational WSCP