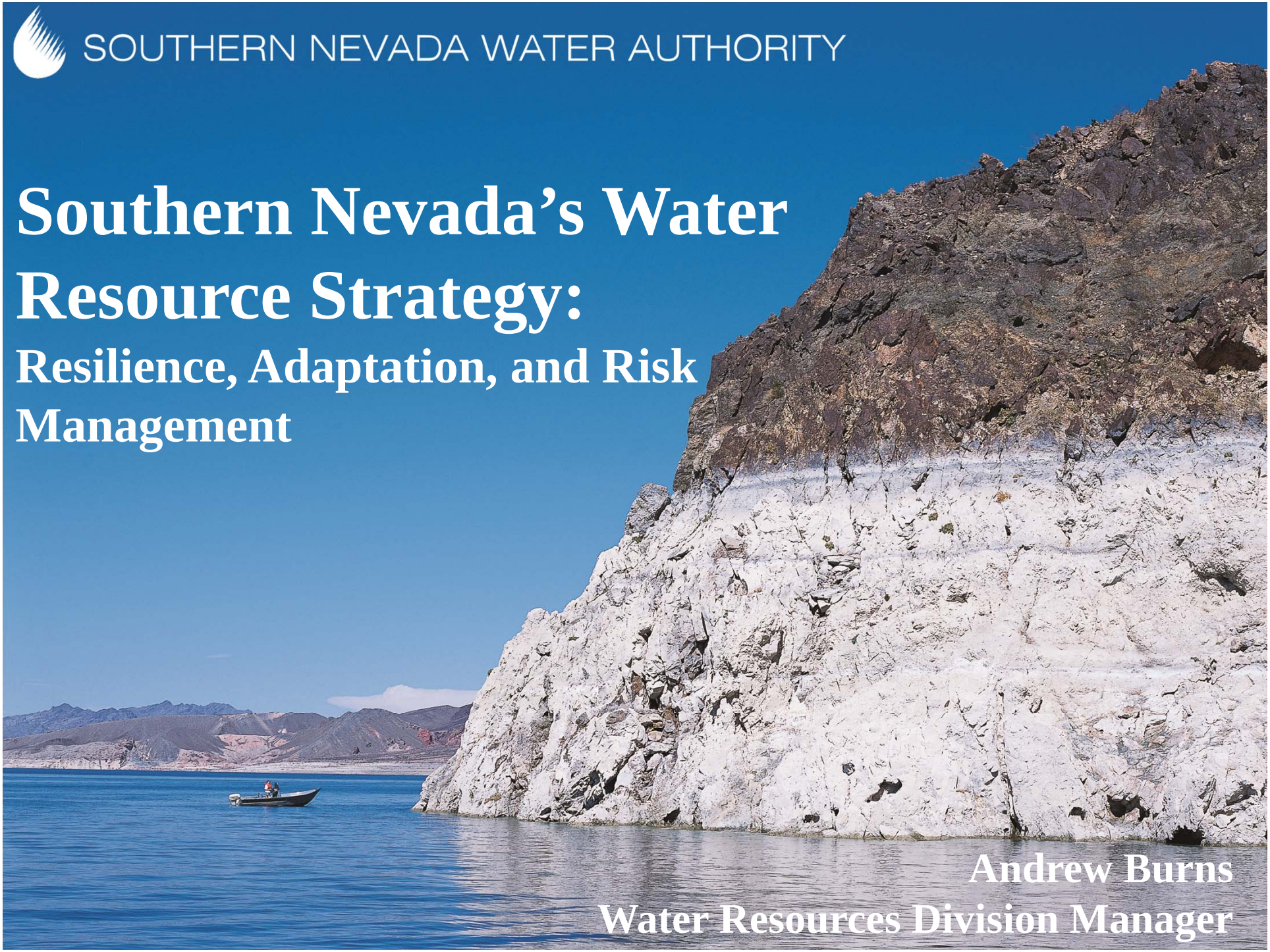
SOUTHERN NEVADA WATER AUTHORITY

Southern Nevada's Water Resource Strategy:

Resilience, Adaptation, and Risk Management



Andrew Burns
Water Resources Division Manager


The Southern Nevada Water Authority and its member agencies meet the water demands of Southern Nevada's 2 million residents (70% of the state's population) and 40 million annual visitors.
• $93 Billion in Gross Domestic Product
• 70.4% Nevada Total Gross Domestic Product

The Southern Nevada Water Authority is a not-for-profit agency created in 1991 to provide a safe, reliable water supply for Southern Nevada.

Regional Water Supply Planning

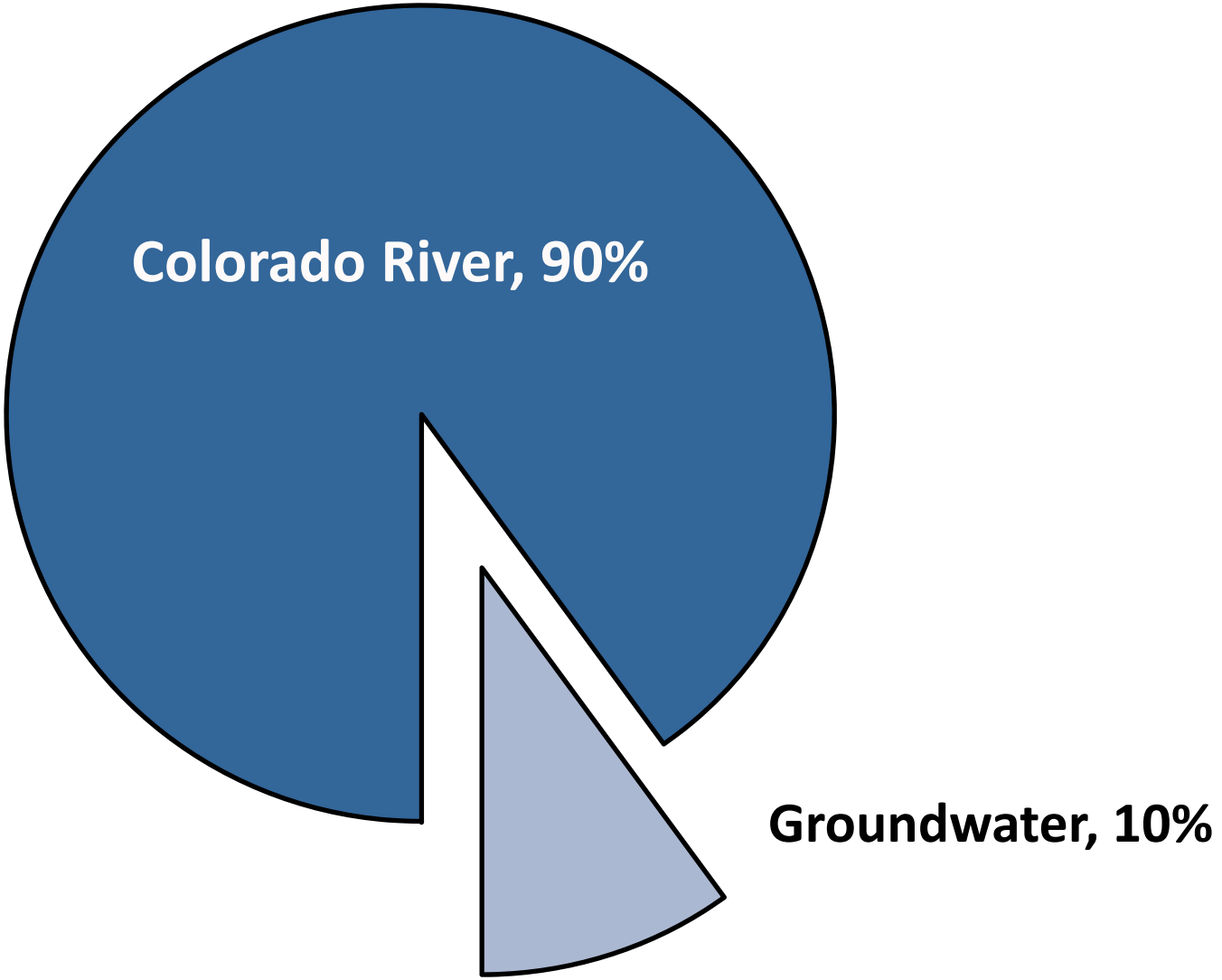
Conservation Programming

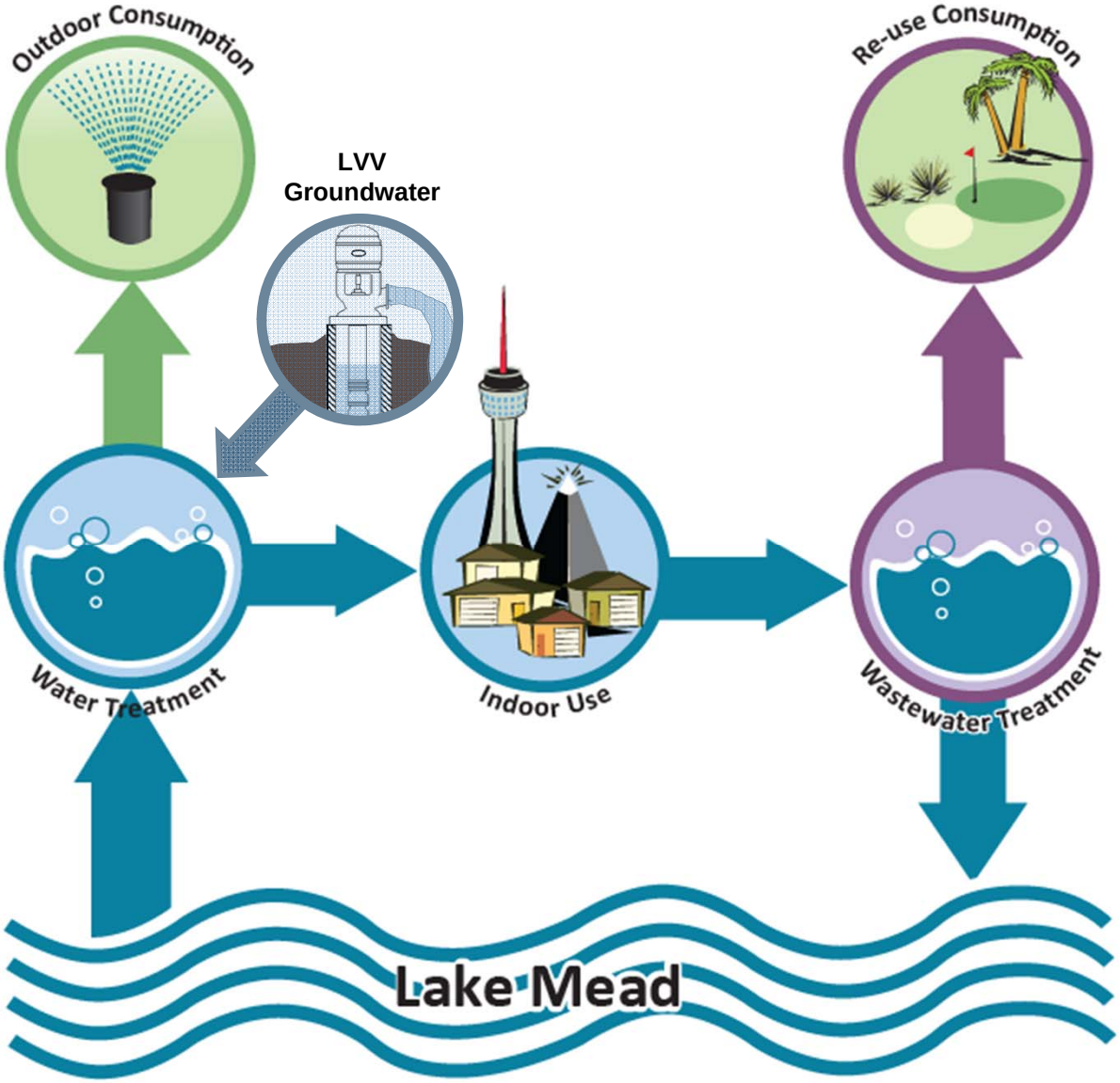
Water Treatment

Facility Construction

Regional Facility M&O

Potable Water Supplies





2014 CRW

Diversion 441,122 af

Return Flow 216,509 af

Consumptive use 224,613 af

2014 Groundwater

LVVWD 44,550 af

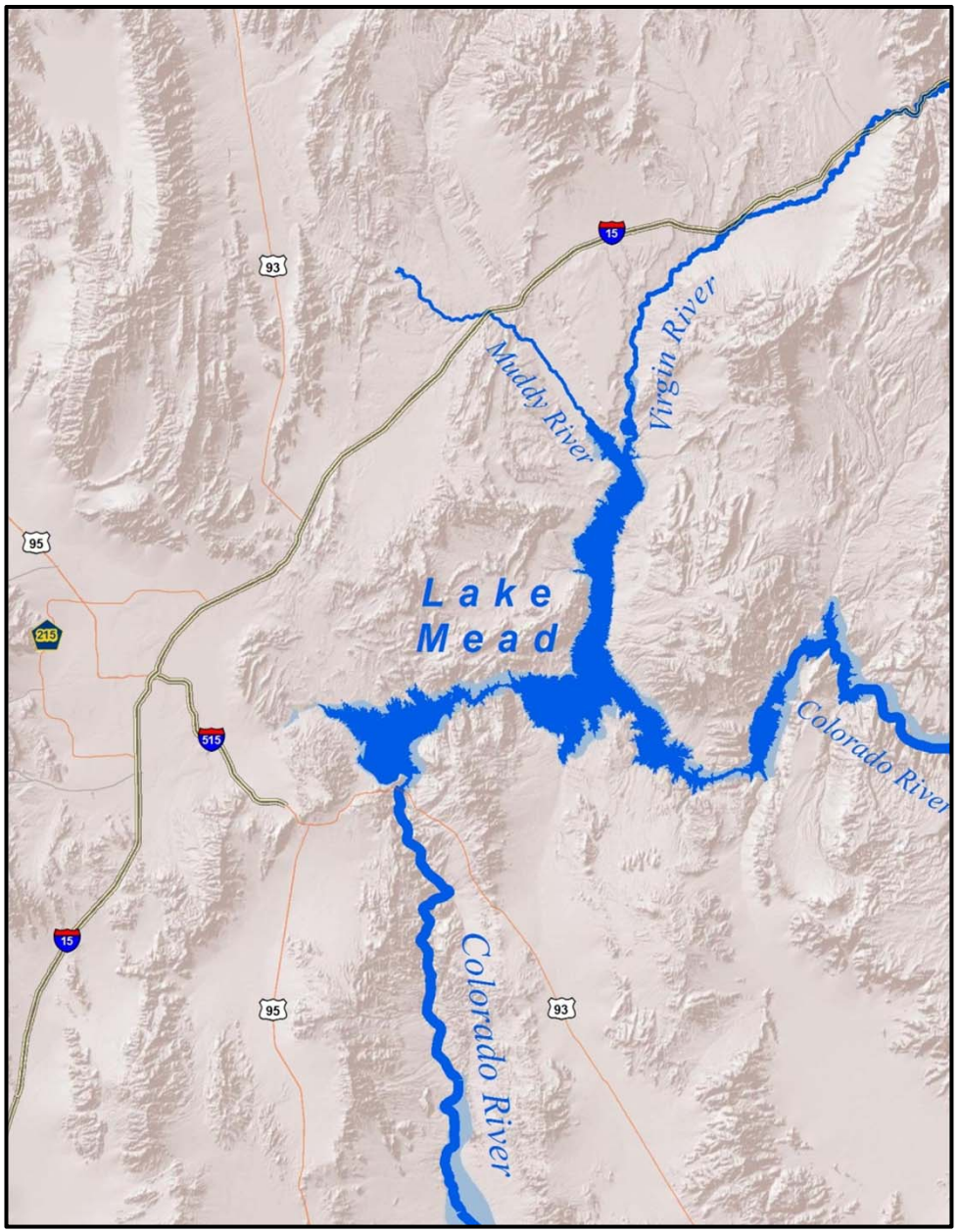
NLV 4,758 af

Colorado River Basin – Basic Facts

- Is more than 1,450 miles long
- Drains 246,000 square miles (approx. 1/12 of the continental U.S.)
- Has an average annual flow of about 15 million acre-feet
- Colorado River water is used in the U.S. by approximately 40 million people for domestic and industrial uses, and to irrigate nearly 5.5 million acres

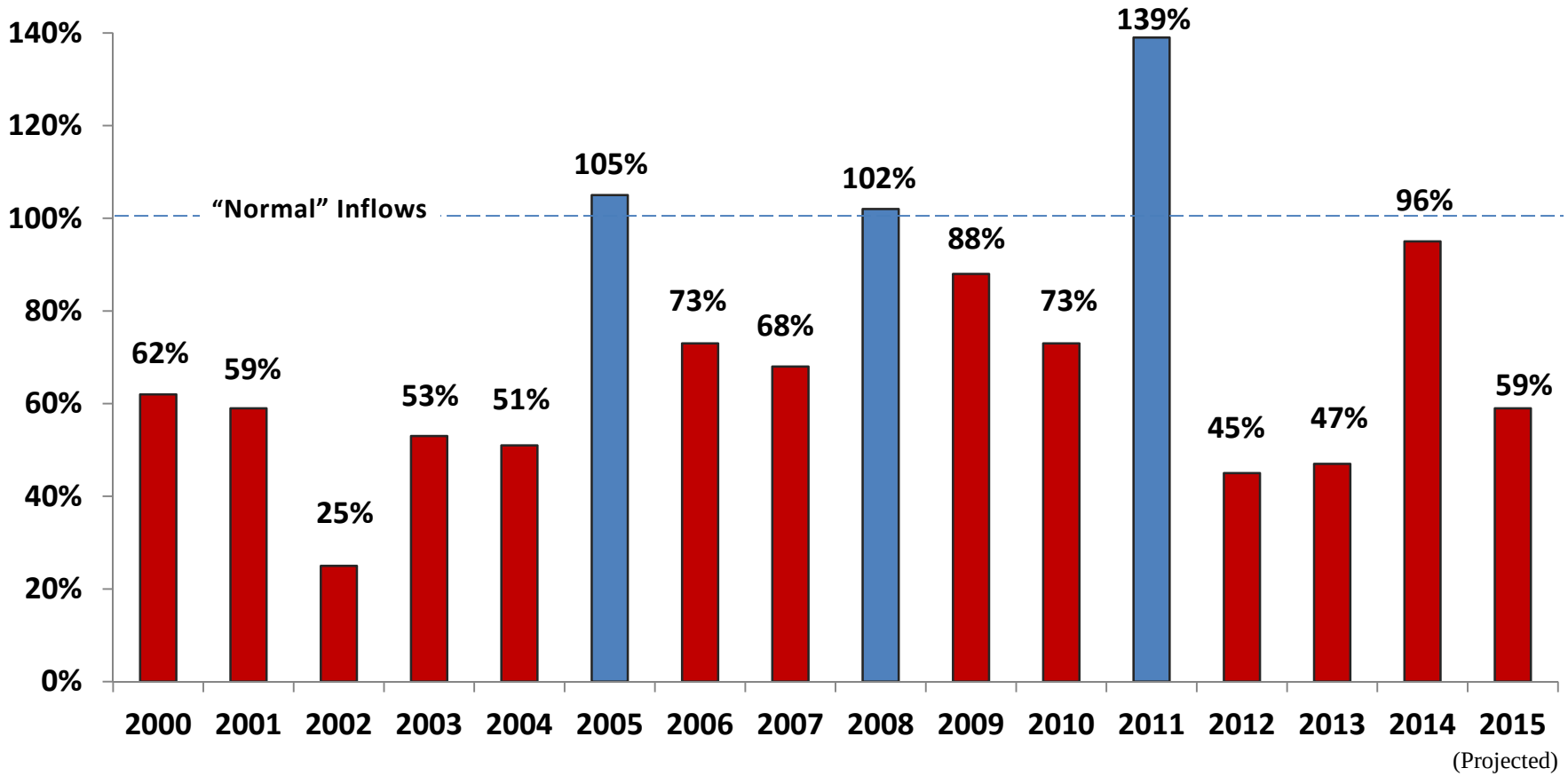
Nevada Colorado River Resources

- **300,000** afy consumptive use apportionment
- **> 1.25** maf of interim Colorado River Supplies
  - 600 kaf stored in Arizona Water Bank
  - 200 kaf stored in California Water Bank
  - 400 kaf credit for Brock Reservoir system efficiency improvement
  - 3 kaf credit for Yuma Desalter system efficiency improvement

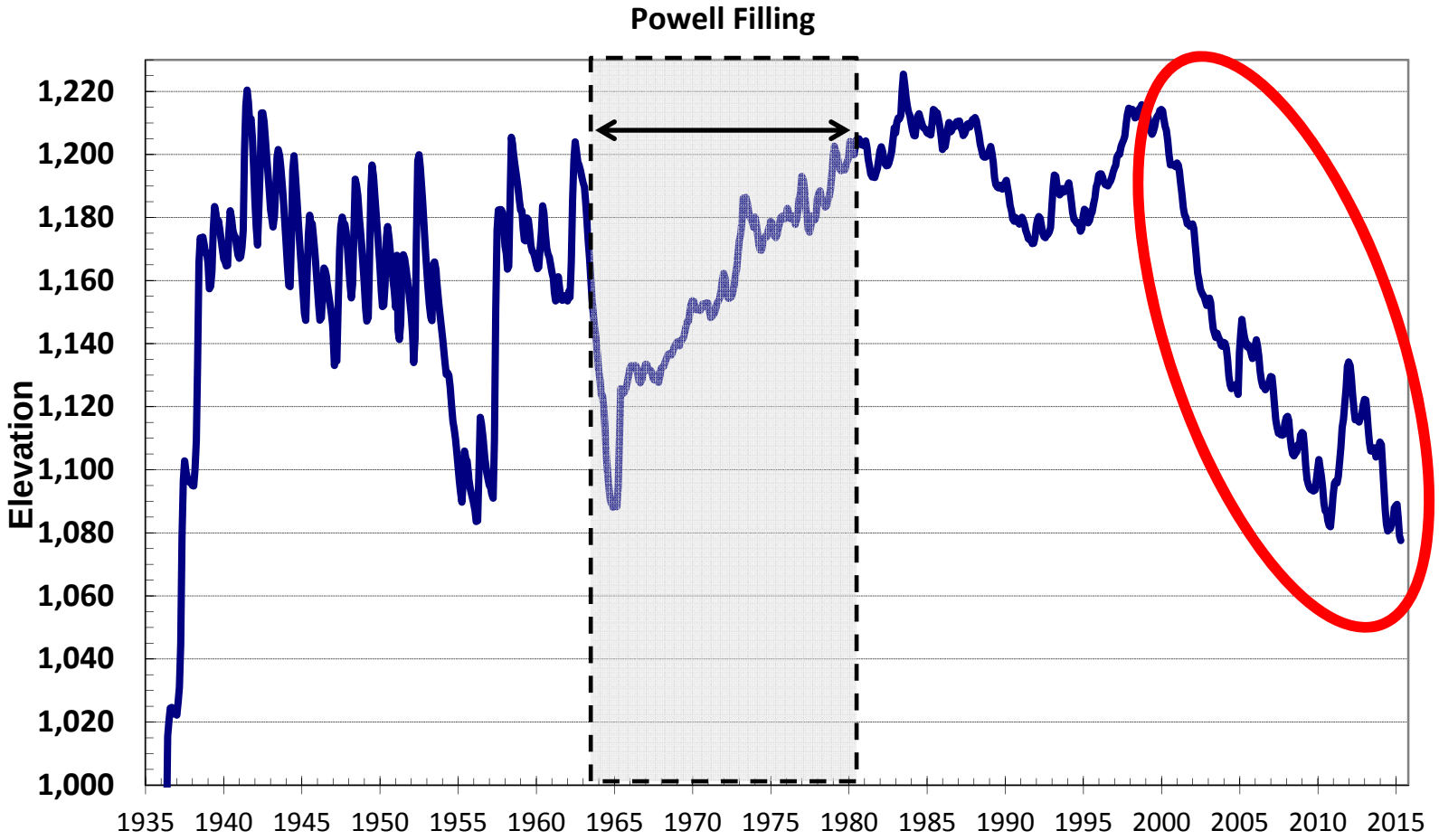



The Colorado River Basin is facing one of the worst droughts in recorded history.

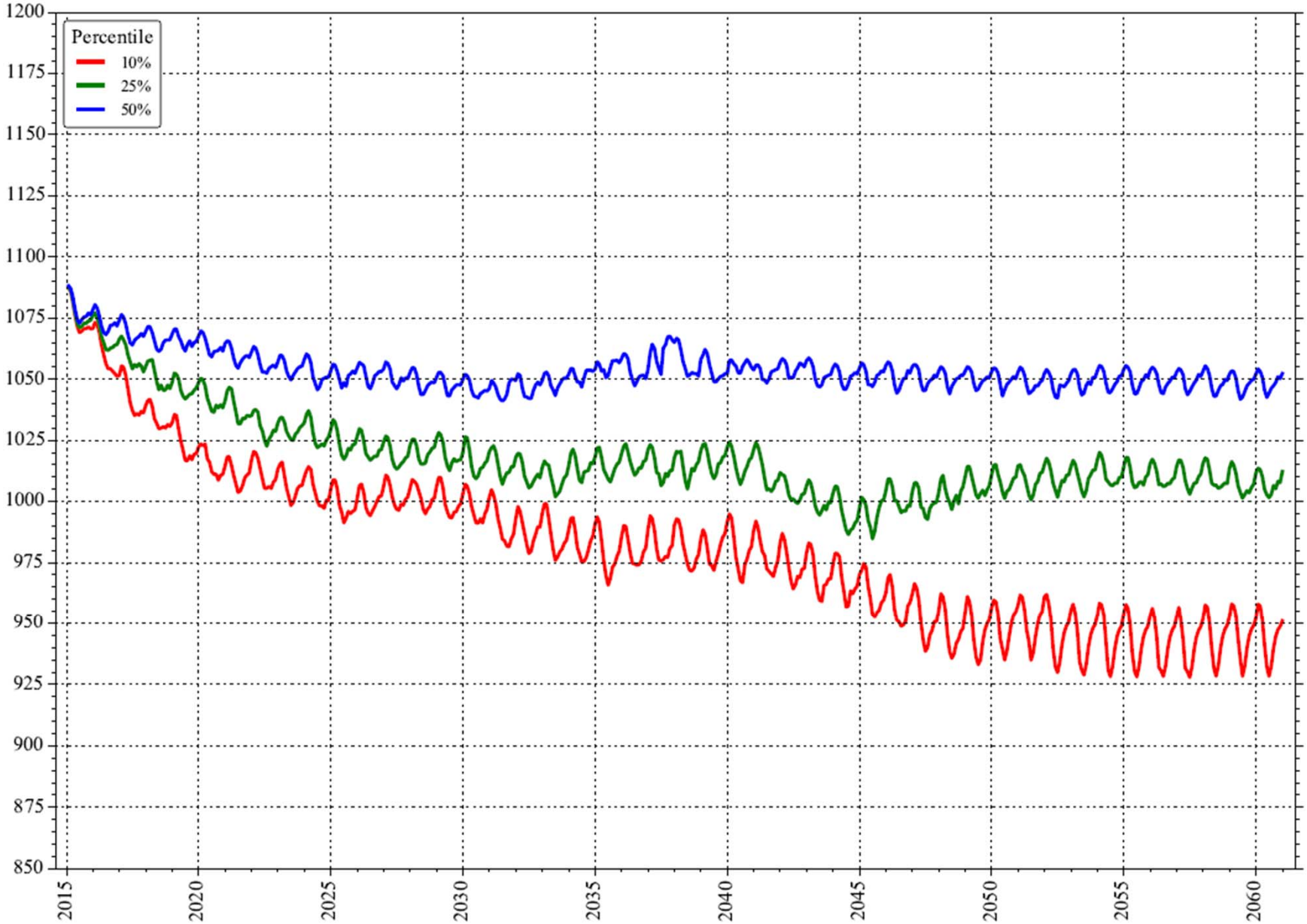
Lake Powell's annual inflows continue to be below normal.



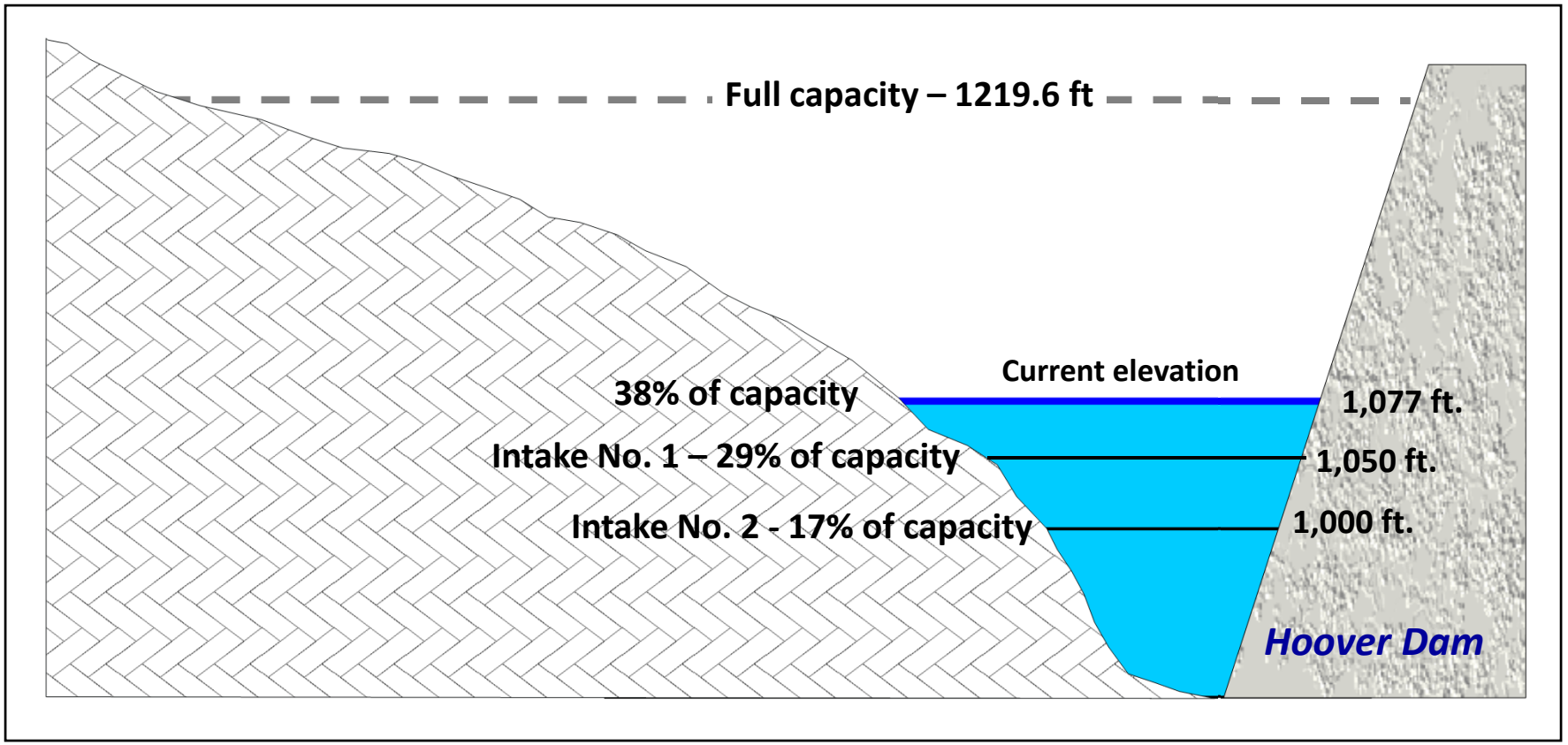
As a result, Lake Mead water elevations have declined more than 135 feet during the past 16 years.



Statistical Percentiles of Future Lake Mead Pool Elevations

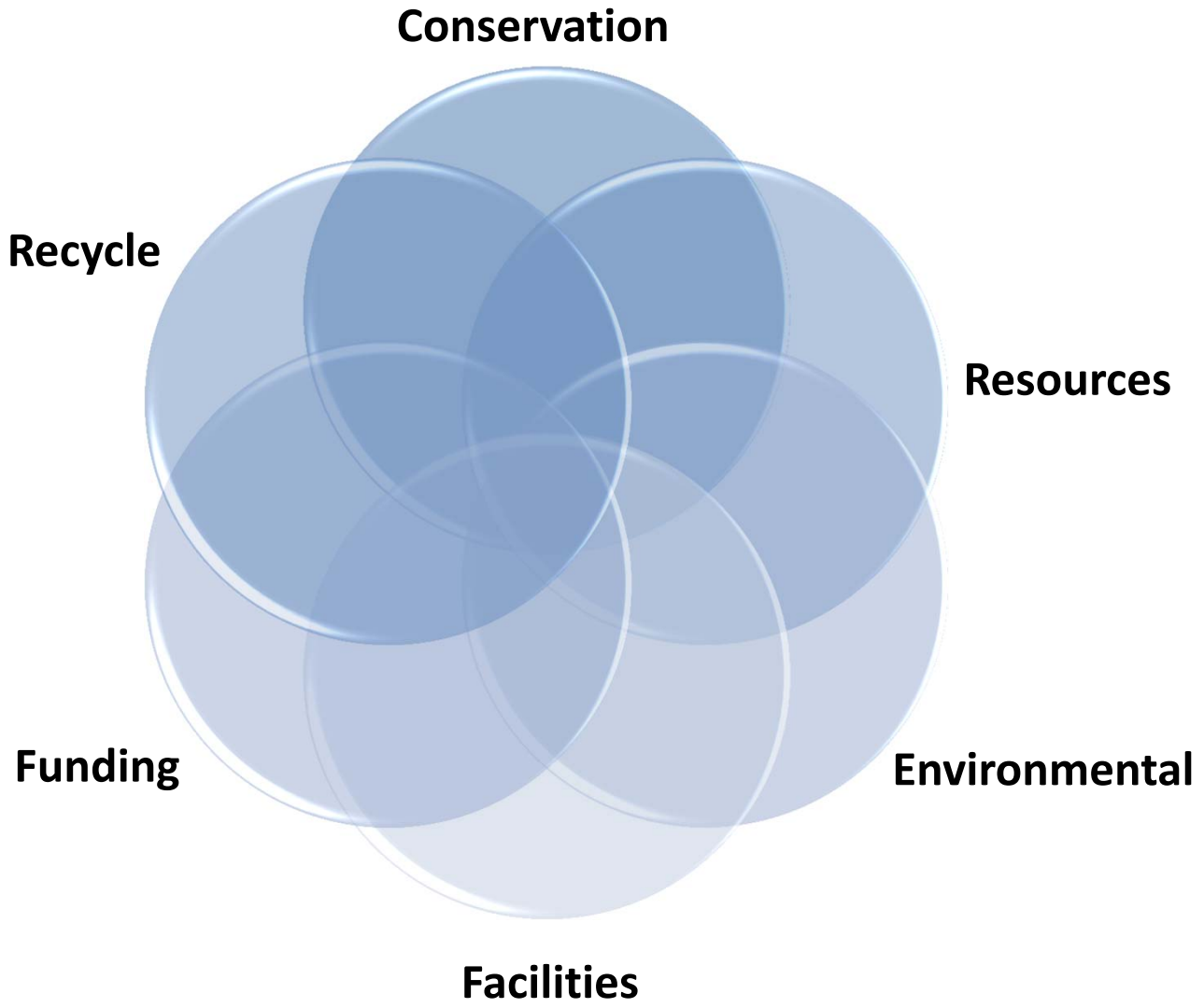


LAKE MEAD ELEVATION and RESERVIOR CAPACITIES



Current Colorado River System Content: 47%

INTEGRATED RESOURCE PLANNING



INTEGRATED RESOURCE PLANNING

Integrated Resource Plan Advisory Committee (1994-96)

- Phase I – Water Resources, Facilities & Conservation
- Phase II – Financing & Water Quality

Integrated Water Planning Advisory Committee (2004-05)

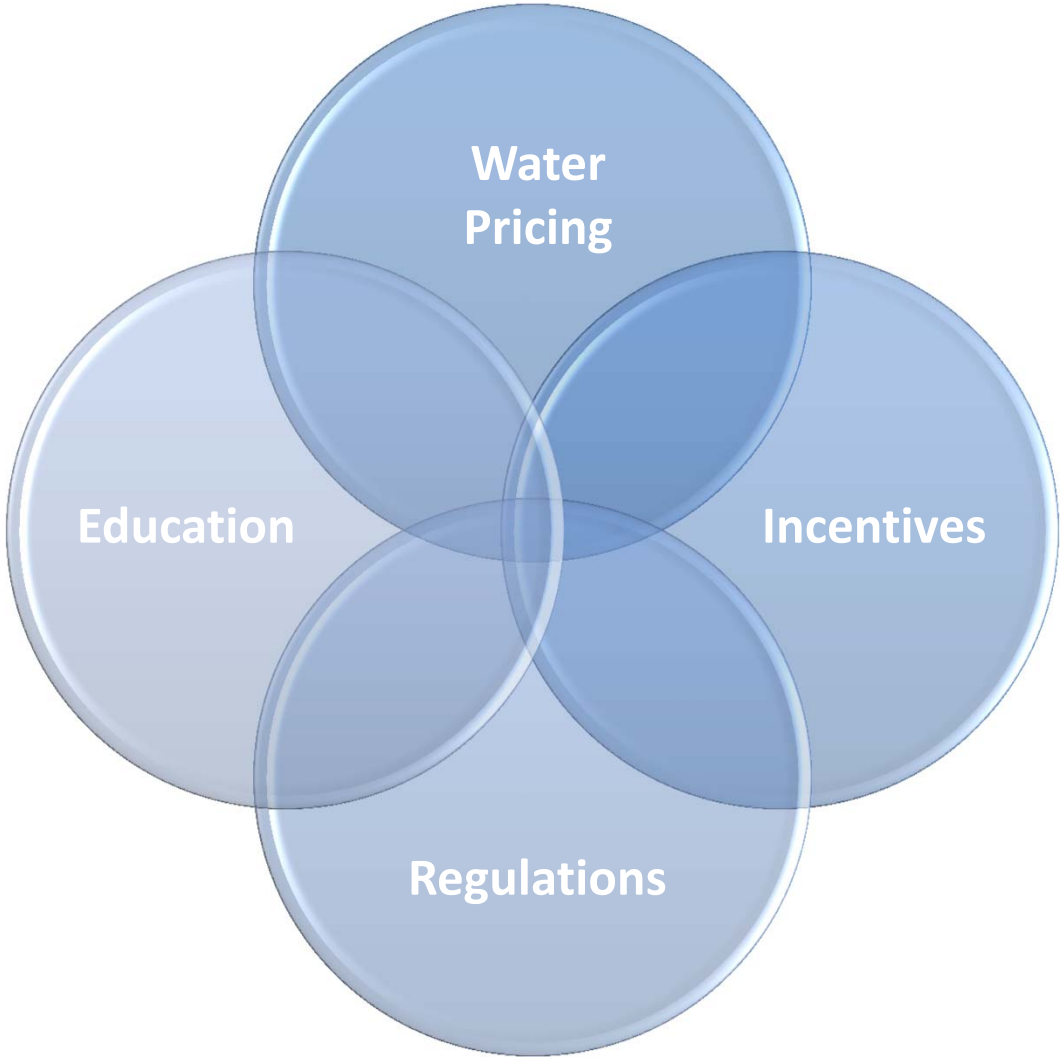
- Integration of in-state water resources into the water planning and management activities of Southern Nevada

Integrated Resource Planning Advisory Committee (2012-2014)

- Phase I – Financing of Essential Water Infrastructure
- Phase II – Water Resources, Facilities & Conservation

RESILIENCE, ADAPTATION, and RISK MANAGEMENT

Southern Nevada has implemented one of the nation's most aggressive and comprehensive water conservation programs.

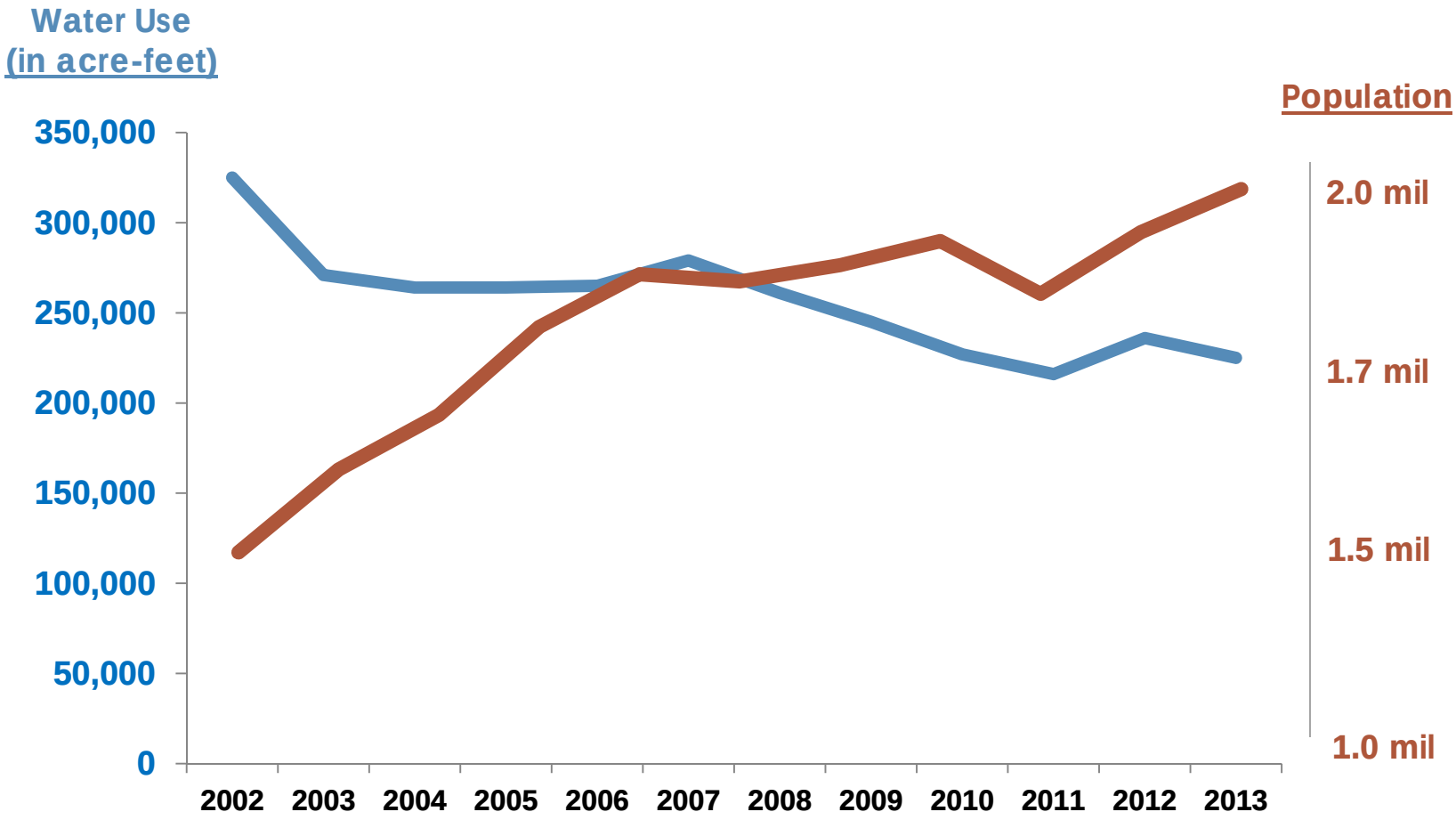


SNWA's Water Smart Landscapes Program:

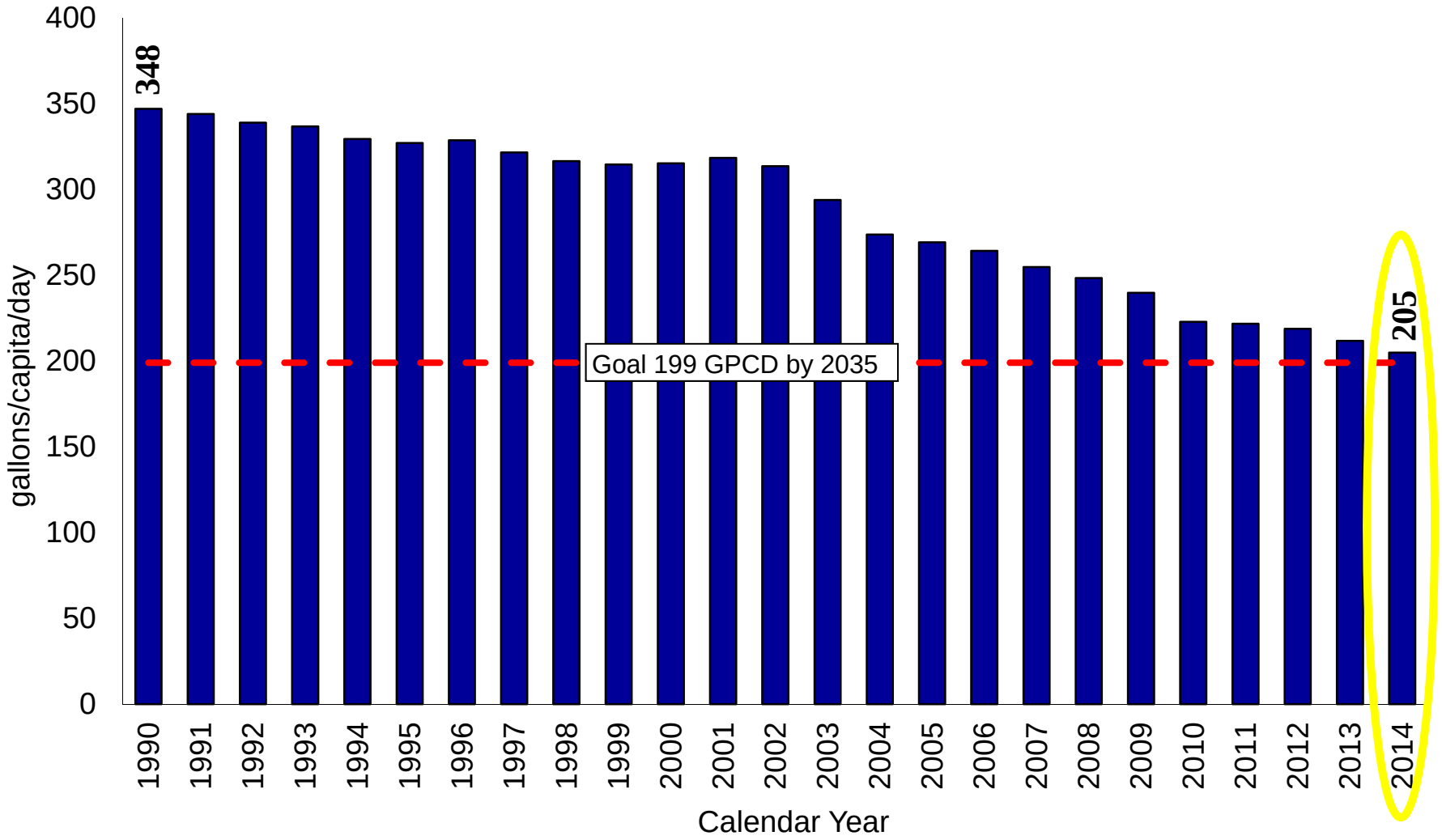
- Started in 1999
- $205 million invested to date
- 240,000 acre-feet saved
- 172 million square feet of turf converted

Southern Nevada has removed enough grass for a roll of sod to extend 87% of the earth's circumference!

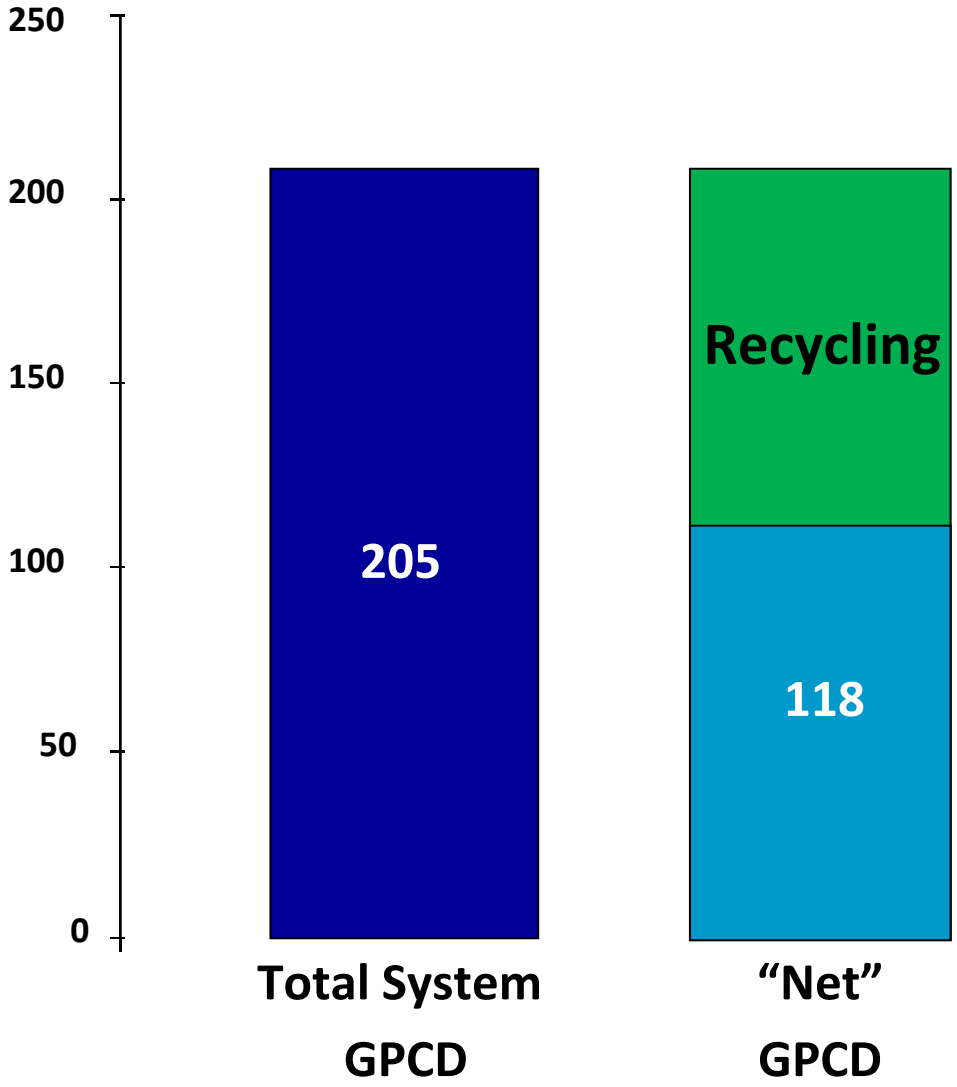
Southern Nevada consumptively used about 100,000 acre-feet less water in 2013 than in 2002, despite adding 480,000 new residents and serving nearly 40 million annual visitors.



SNWA Total System GPCD 1990 to 2014

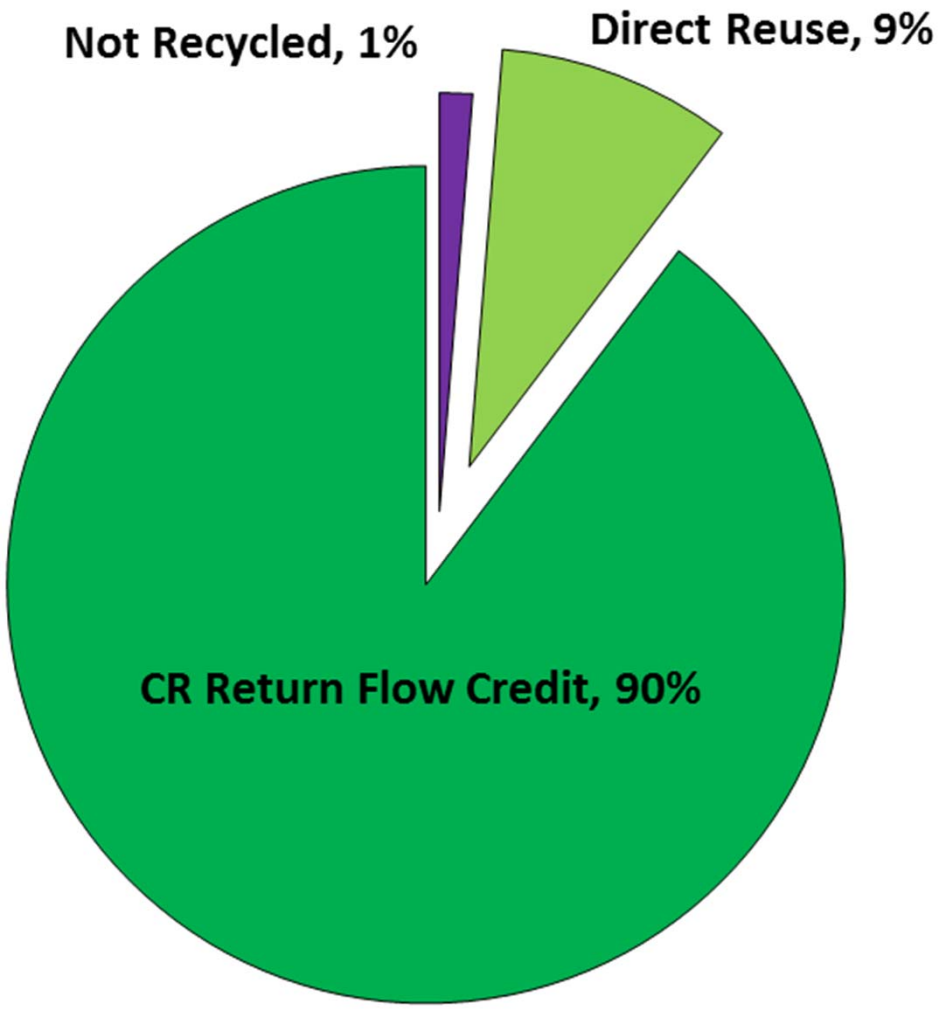


2014 GCPD



Direct reuse and Colorado River return-flow credits allow Southern Nevada to recycle 99% of the treated wastewater flows.

2014 Use of Highly Treated Wastewater Effluent



CR Returns Flow to Lake Mead via the Las Vegas Wash

- 180,000 af

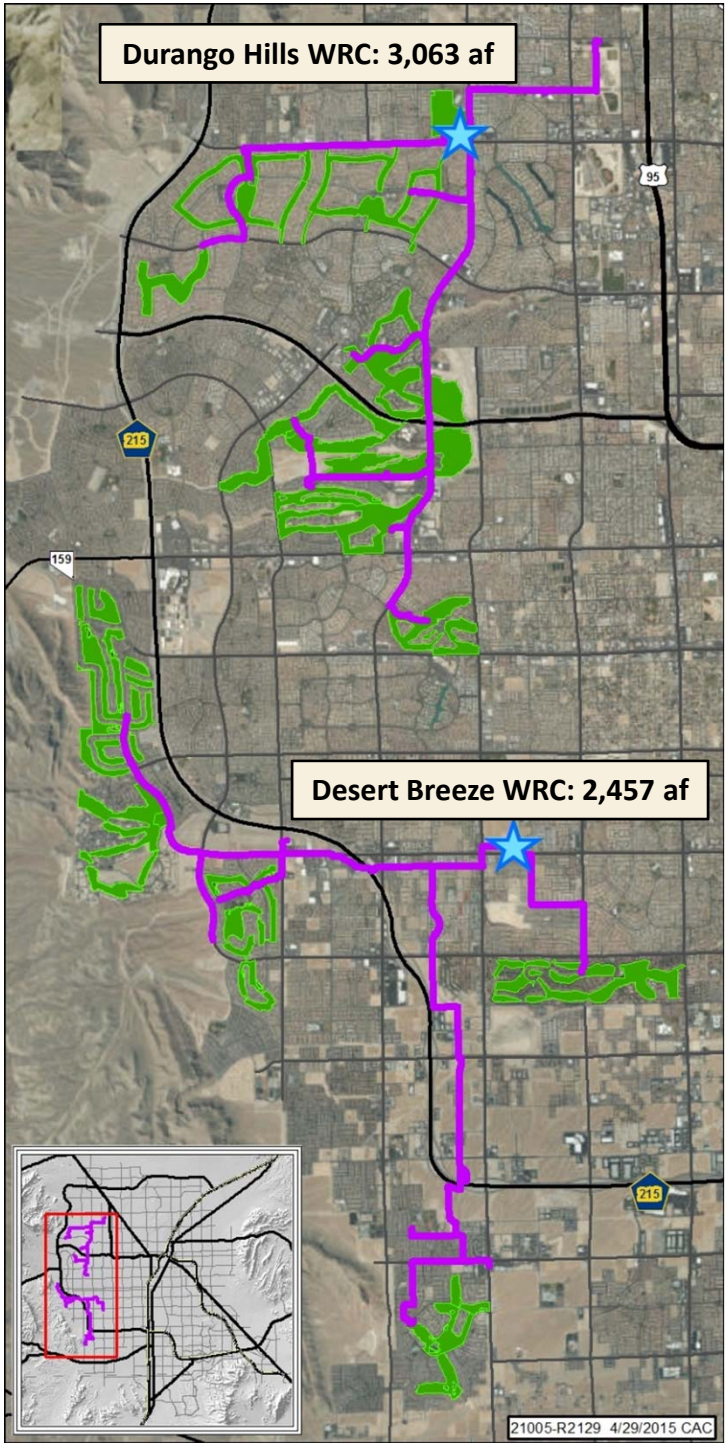
Direct Reuse

- 18,000 af

Not Recycled

- 2,500 af

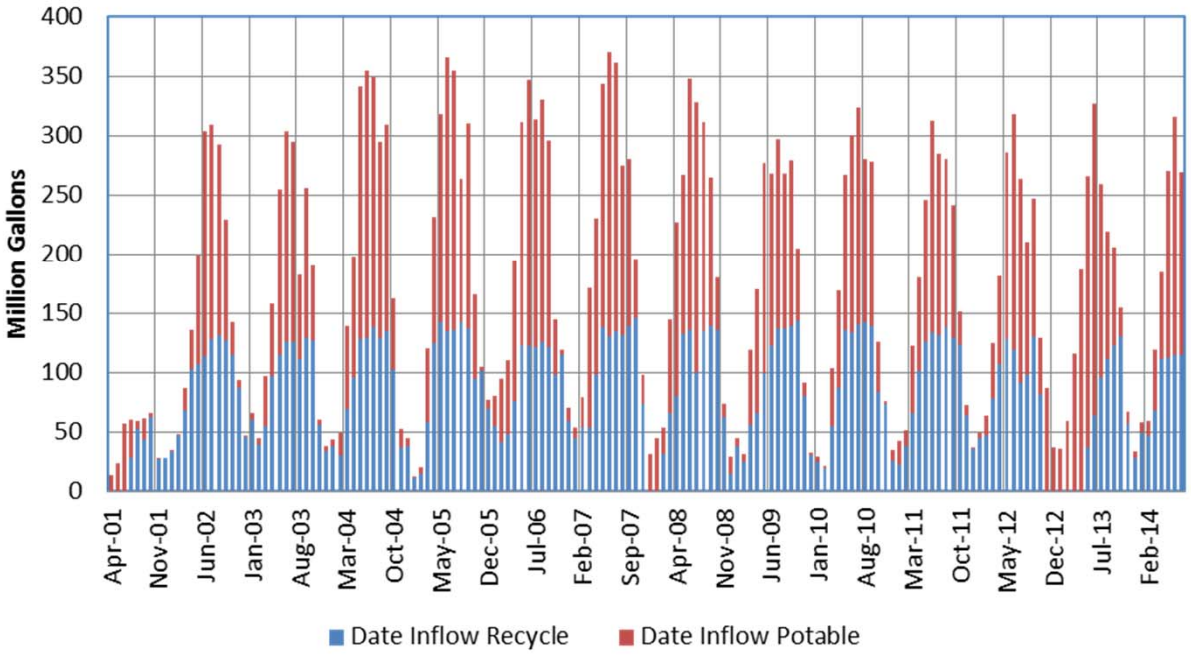
Colorado River Return Flows - Las Vegas Wash



2014 Direct Reuse in Las Vegas Valley

Clark County	6,042 af
City of Las Vegas	4,964 af
City of Henderson	6,772 af
Boulder City	384 af

Durango Hills Water Resource Center
Production and Consumption by Source



City of Las Vegas

Durango Hills WRC

- $37 million facility
- 10 MGD capacity
- Groundwater from LVVWD production wells used to augment supplies during peak demands
  - Golf courses
  - Greenbelts
  - Schools
  - Parks

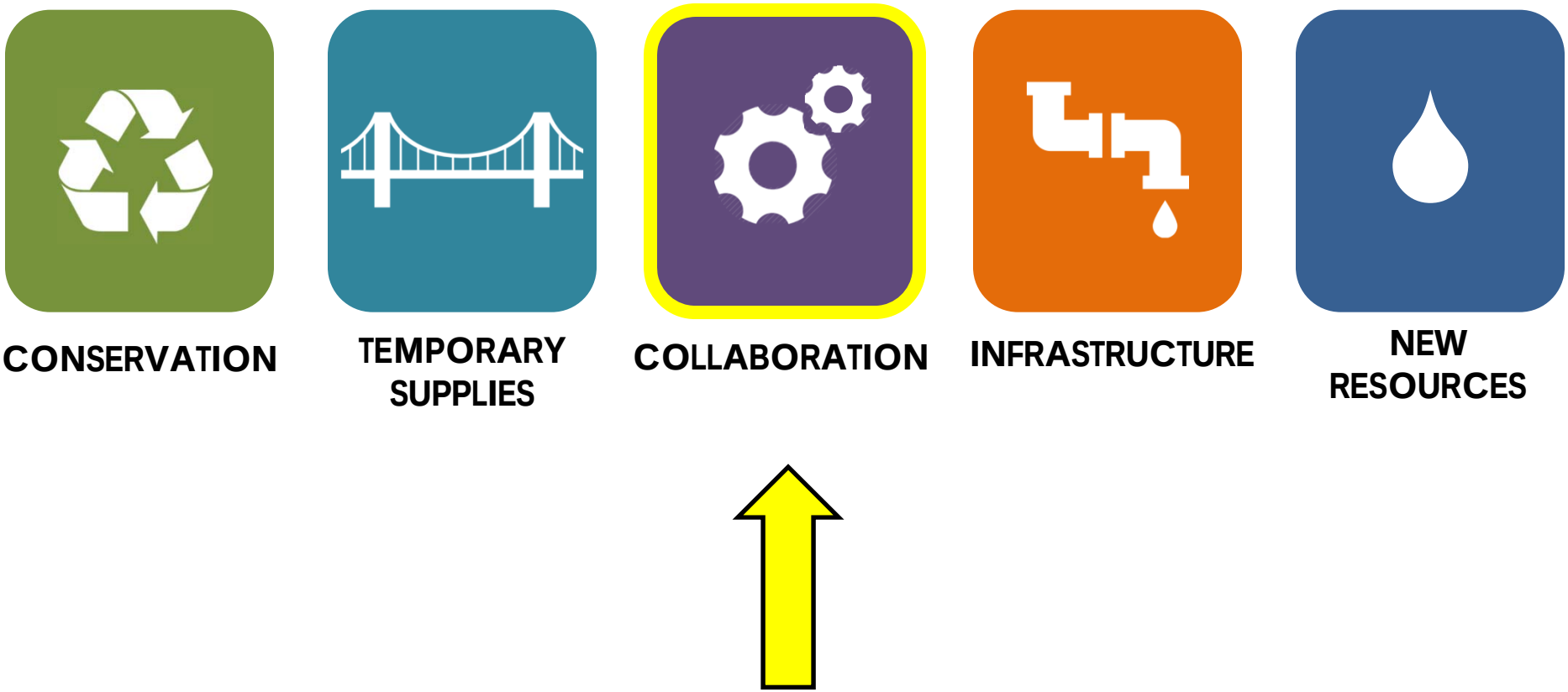
RESILIENCE, ADAPTATION, and RISK MANAGEMENT


Virgin River, Nevada

Temporary water supplies will meet demands during shortages and provide interim resources while long-term supplies are developed.

- Arizona Water Bank
- California Water Bank
- Southern Nevada Water Bank
- Virgin and Muddy River Tributary Conservation and Imported ICS
- Brock Reservoir ICS
- Yuma Desalting Plant
- Extraordinary Conservation ICS
- Binational ICS

RESILIENCE, ADAPTATION, and RISK MANAGEMENT



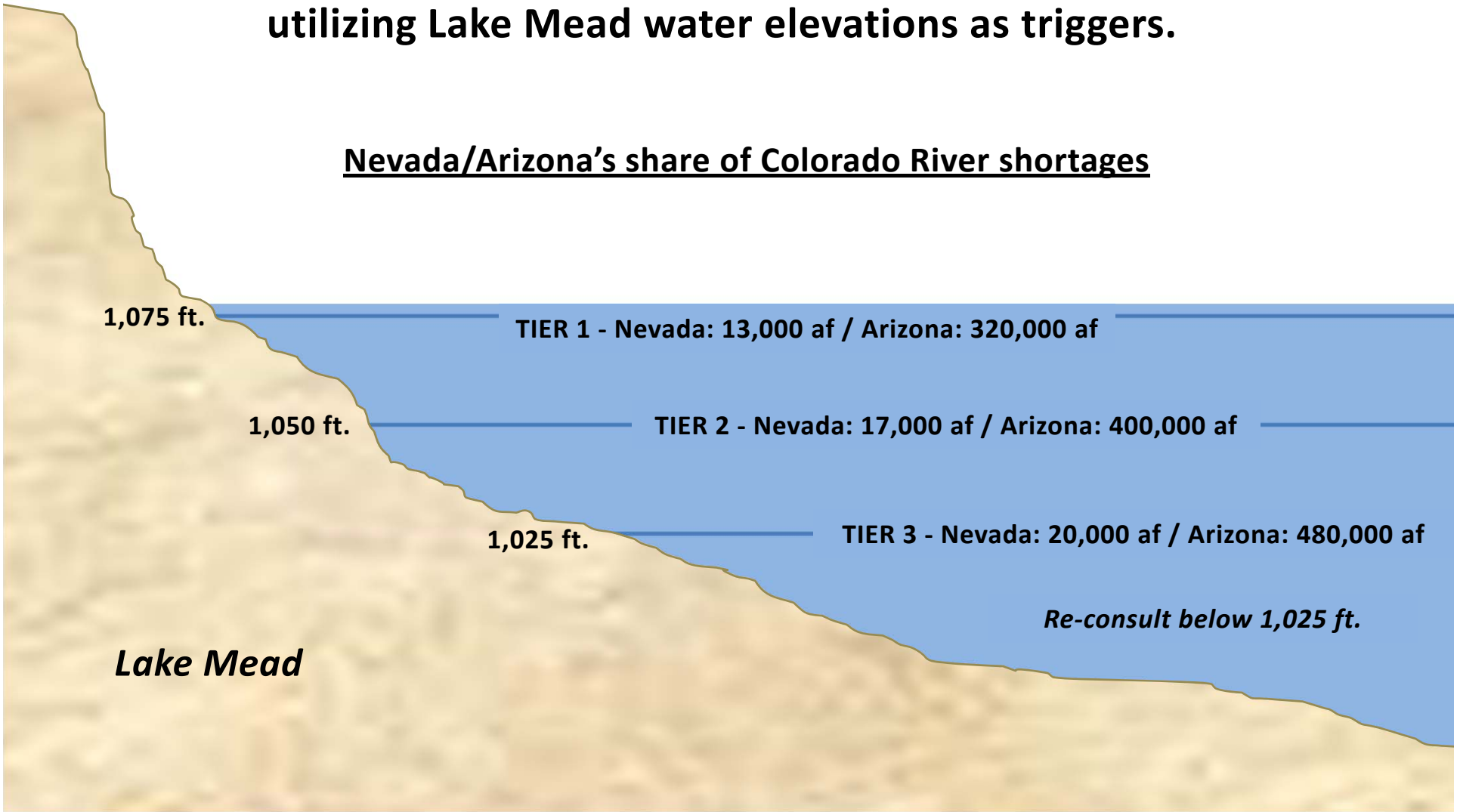
BASIN COLLABORATION

Since the onset of the drought, the seven Colorado River Basin states have been cooperatively addressing river issues:

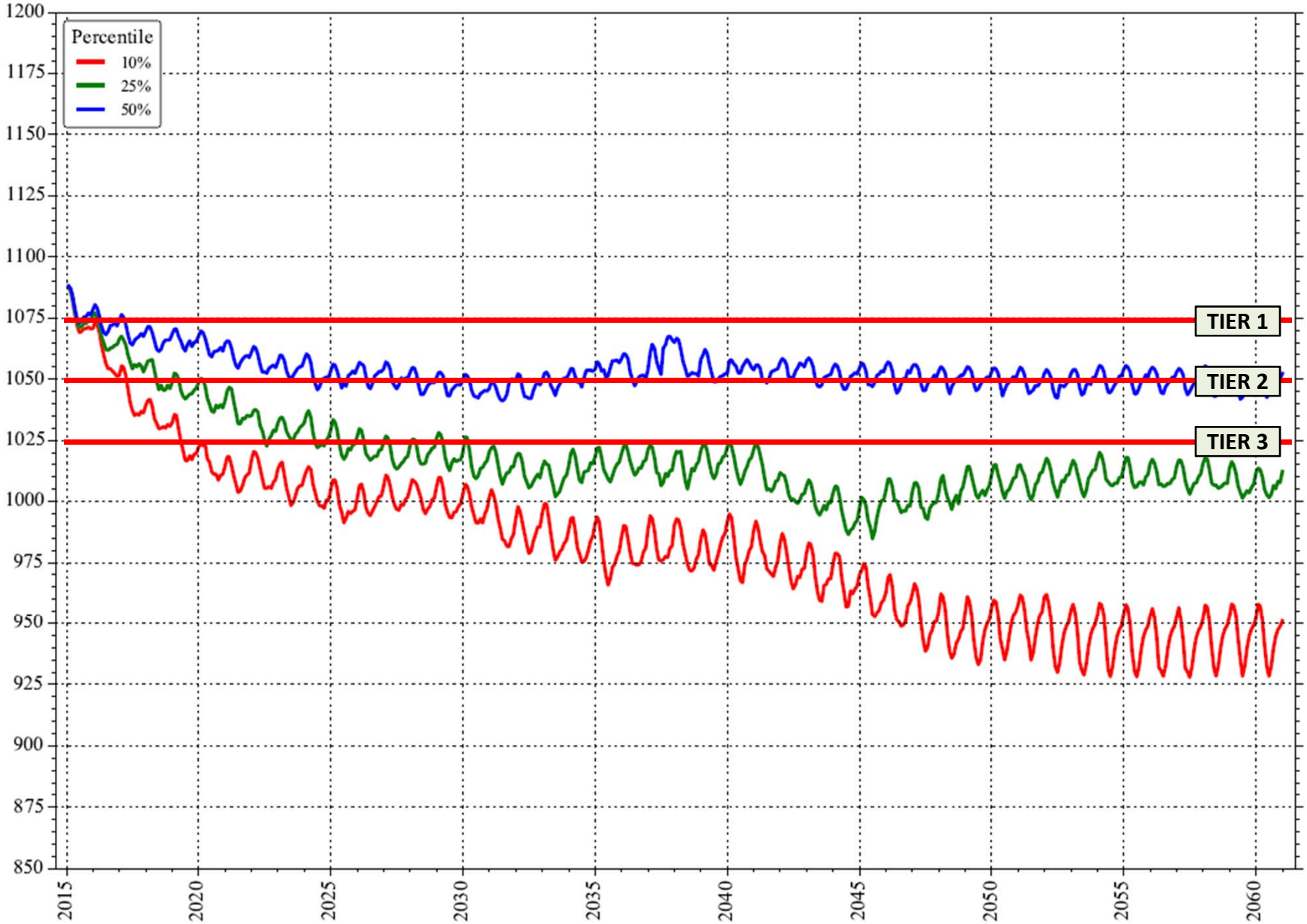
- Coordinated operations of the system's two major reservoirs
- Shortages (timing and quantity)
- Created a mechanism for Intentionally Created Surplus
- Pilot System Conservation
- CR System MOU
- Colorado River Basin Study
- Environmental issues

SHORTAGE SHARING

The Basin States developed a framework to manage shortages, utilizing Lake Mead water elevations as triggers.



Statistical Percentiles of Future Lake Mead Pool Elevations



PILOT COLORADO RIVER SYSTEM CONSERVATION

What it is:

- A "bank account" that funds projects throughout the Colorado River Basin to reduce Colorado River demands or create additional system water

What it does:

- Benefits system as a whole: no funding partner receives additional water rights

Funding:

- $11 million program ($3 million from federal partners; $2 million each from four municipalities, including SNWA)

Yield:

- Estimated 60,000 – 100,000 AF of conserved water

COLORADO RIVER SYSTEM MOU (December 2014)

What it is:

- Collaborative agreement among Lower Basin and federal partners to bolster storage in Lake Mead from 2014 to 2017

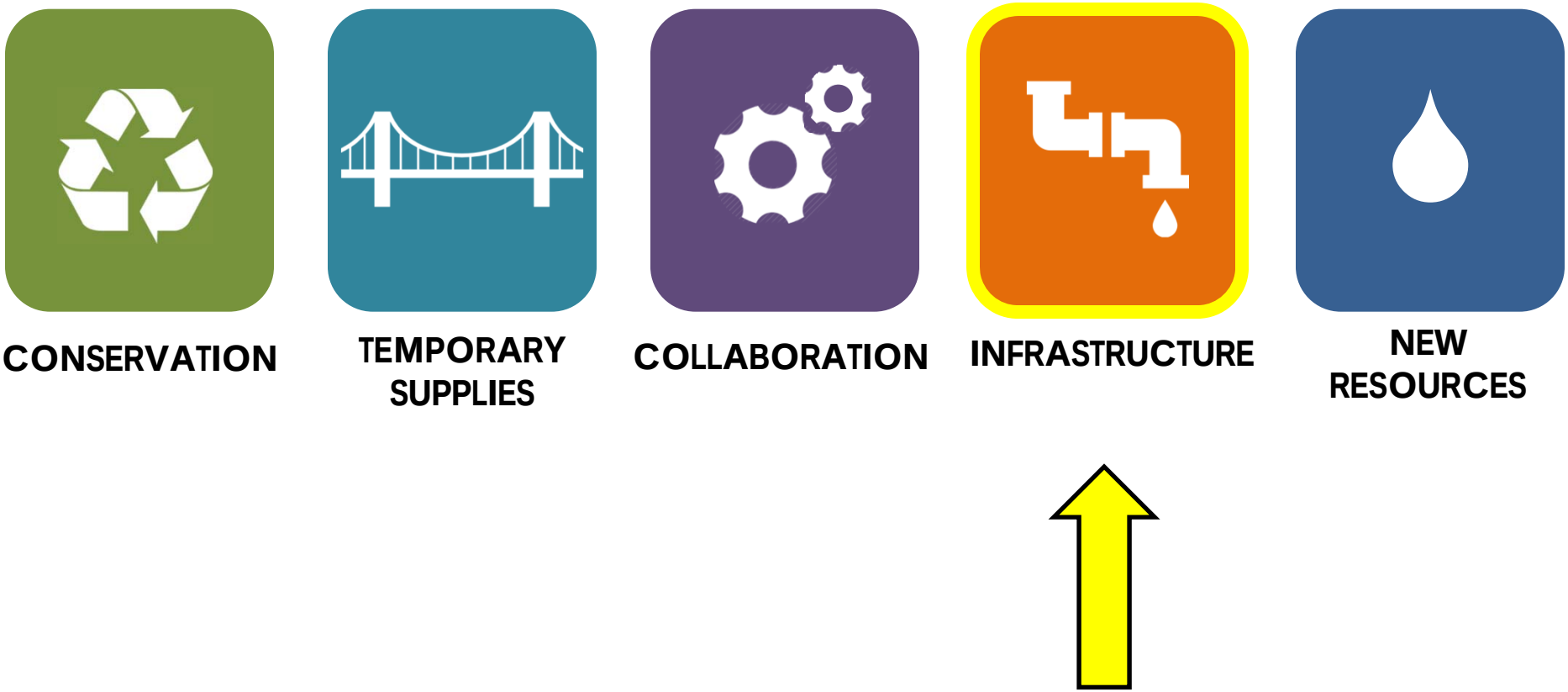
What it does:

- Establishes "Protection Volumes"
- Initiates additional drought response actions if Lake Mead's elevation is below 1,060 feet at end of year

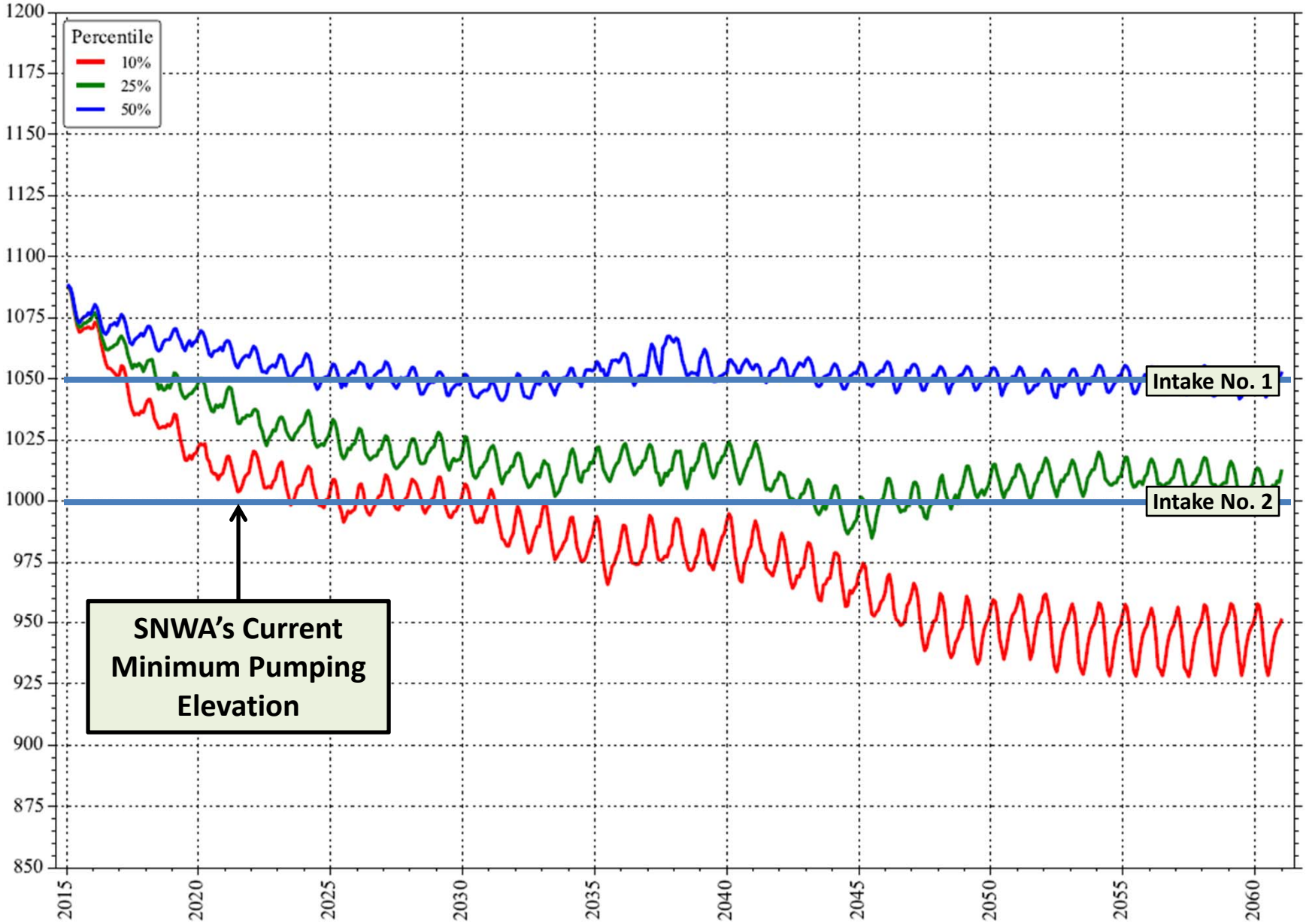
Protection Volumes:

- SNWA: 45,000 AF
- Central Arizona Water Conservancy District: 345,000 AF
- Metropolitan Water District of Southern California: 300,000 AF
- Bureau of Reclamation: 50,000 AF

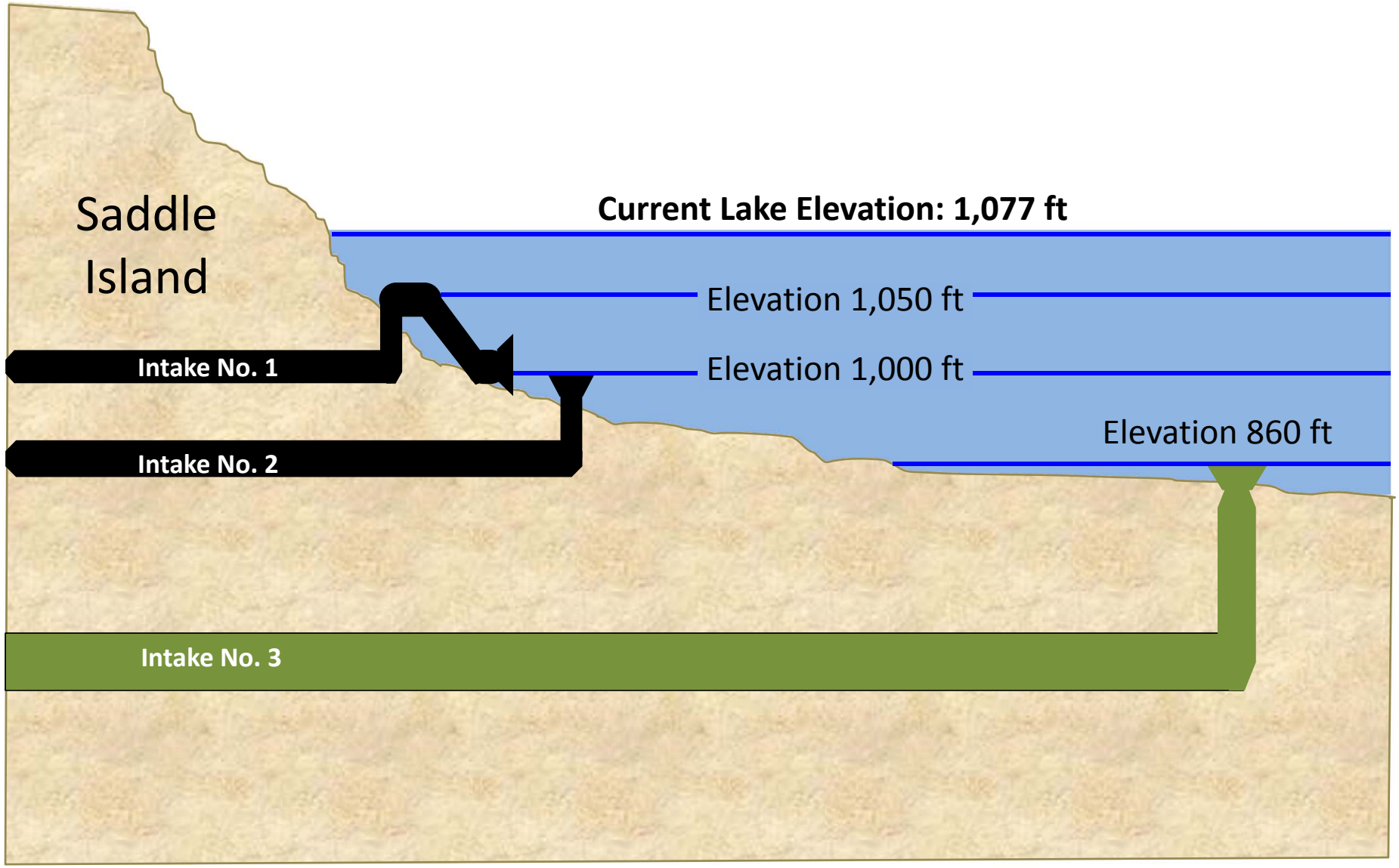
RESILIENCE, ADAPTATION, and RISK MANAGEMENT



Statistical Percentiles of Future Lake Mead Pool Elevations



LAKE MEAD CROSS SECTION



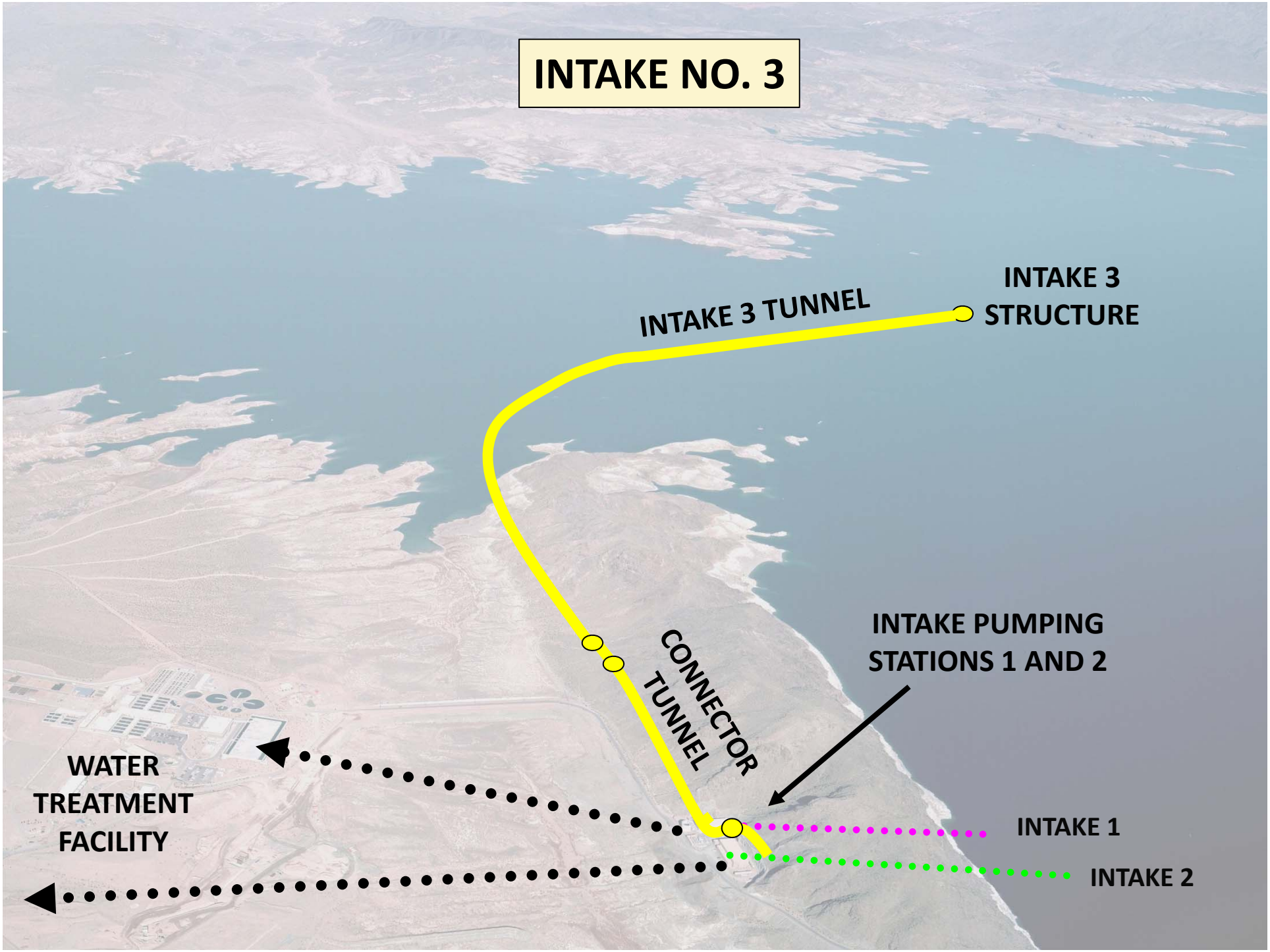
INTAKE NO. 3

Purposes

- Improve system reliability and operational flexibility
- Minimize water-quality issues associated with declining water levels

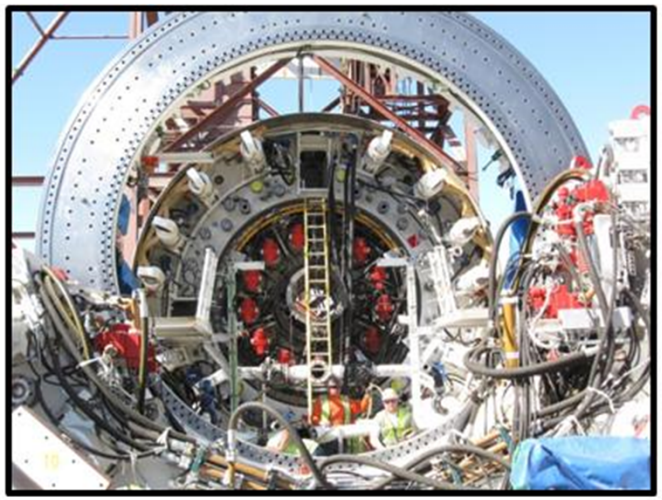
Features

- 96 ft high, 16-ft diameter stainless steel intake (March 2012)
- Connector tunnel linking to intakes and pumping stations Nos. 1 and 2 (March 2013)
- 15,000 ft of 20-ft diameter tunnel (December 2014)
- Provides access to minimum Lake Mead elevation of 860 ft
- Does **NOT** extend pumping capability below elevation 1,000 feet


INTAKE NO. 3
INTAKE 3 TUNNEL
INTAKE 3 STRUCTURE
CONNECTOR TUNNEL
INTAKE PUMPING STATIONS 1 AND 2
WATER TREATMENT FACILITY
INTAKE 1
INTAKE 2

INTAKE NO. 3

Muck Conveyor System

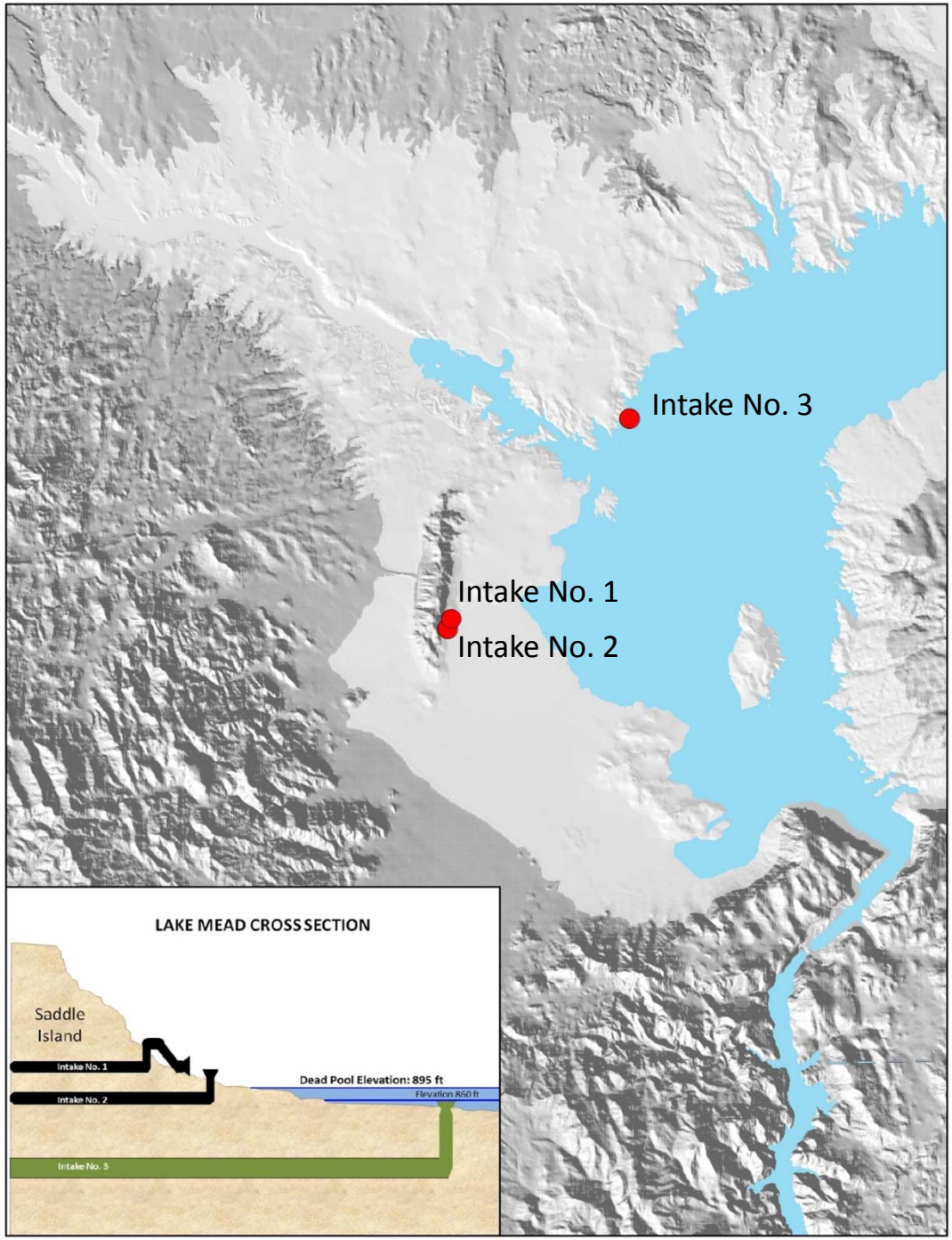


Tunnel Boring Machine Assembly

Intake Tunnel

Intake Structure

Starter Tunnel



Dead Pool Elevation:

- 1,050 feet of water above Intake No. 1
- 1,000 feet of water above Intake No. 1
- 950 feet of water above Intake No. 1
- 35 feet of water above Intake No. 2
- 100 feet of water above Intake No. 2
- 150 feet of water above Intake No. 2
- 217 feet of water above Intake No. 3

LOW LAKE LEVEL PUMPING STATION

There is risk of Lake Mead falling below elevation 1,000 ft and SNWA's current minimum pumping elevation

The citizen's advisory committee recommended to begin design and construction of a new low lake level pumping station as soon as possible.

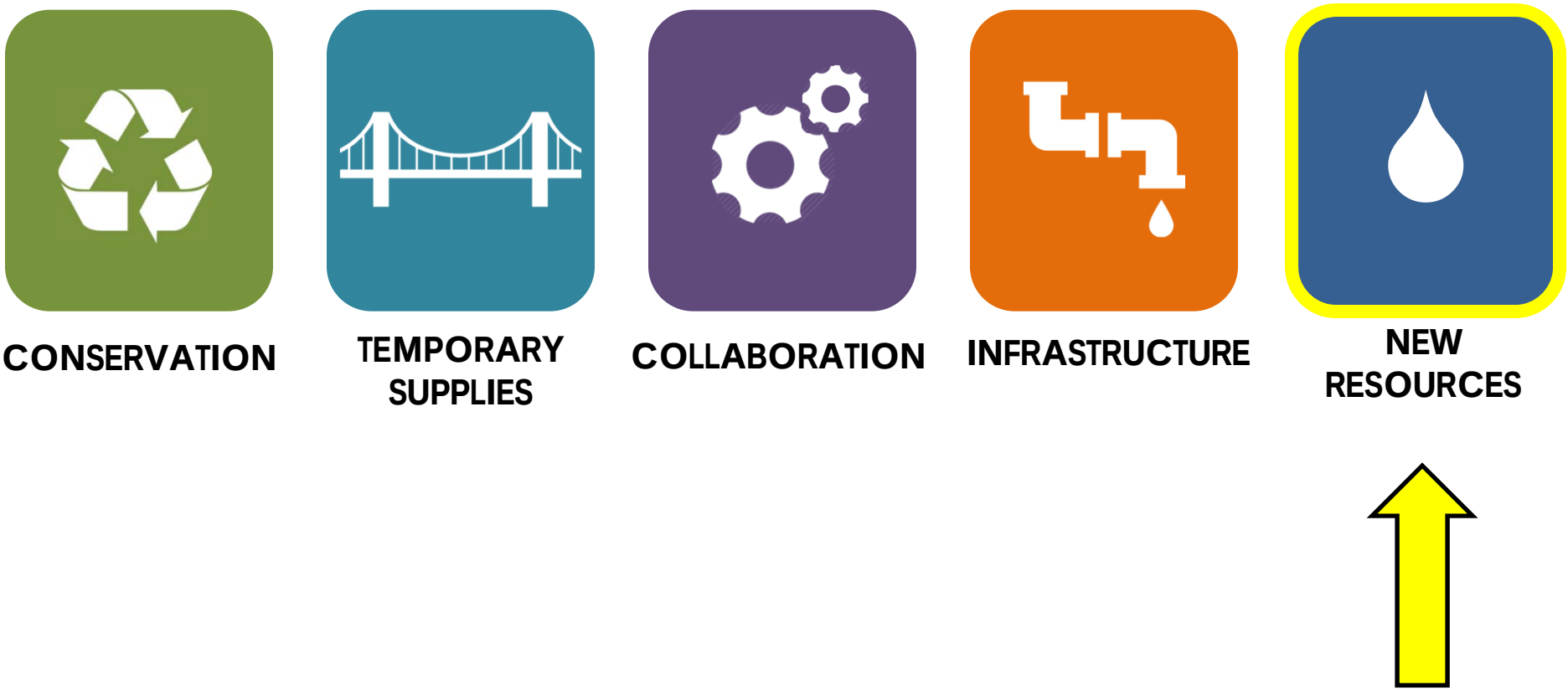
Purposes

- Provide replacement capacity in the event Intake Pumping Station Nos. 1 and 2 are offline due to low lake levels

Features

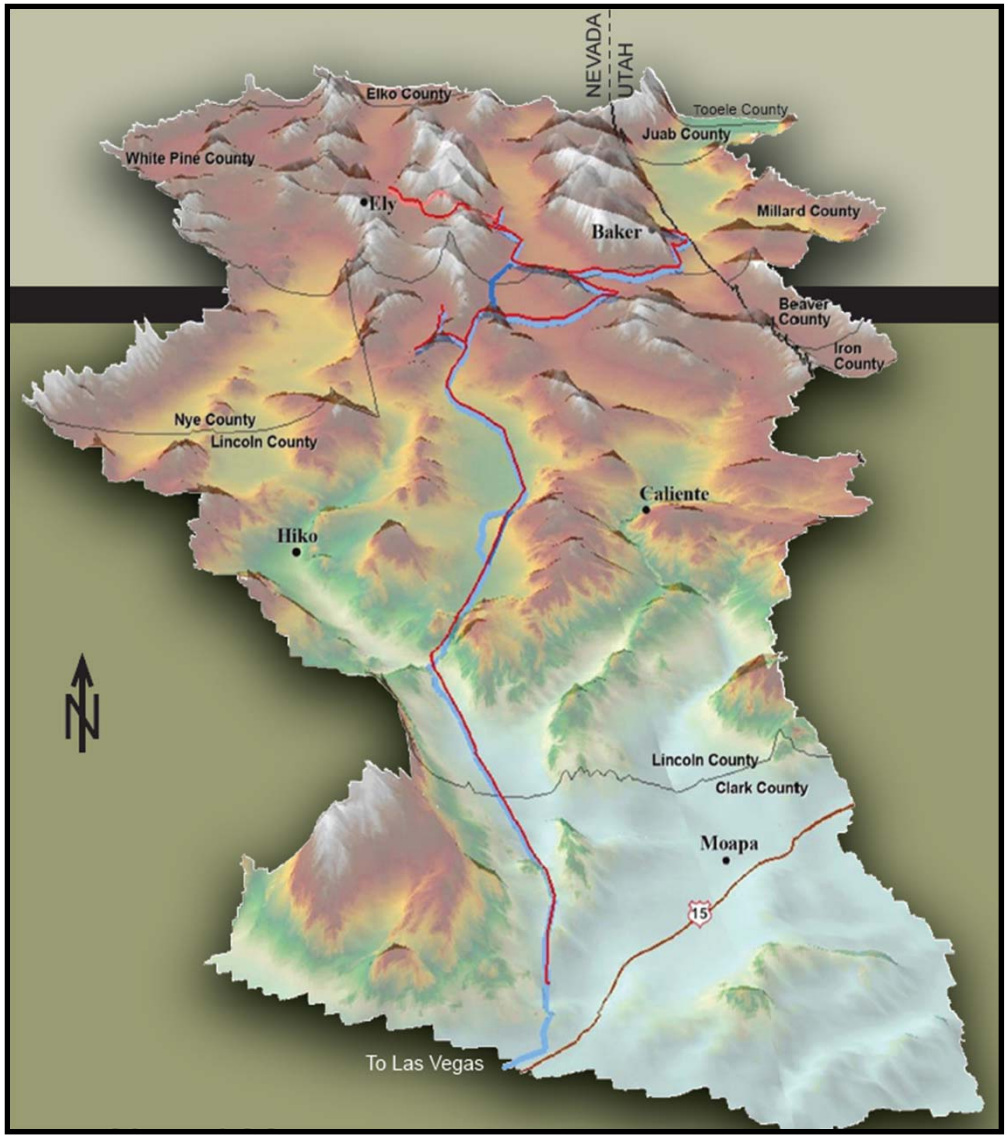
- Design for 900 MGD capacity
- Pump from 875 feet
- Approximate cost: $650 million

RESILIENCE, ADAPTATION, and RISK MANAGEMENT




Despite achievements in conservation and water resources, new resources are needed to provide a long-term, reliable water supply for Southern Nevada.

IN-STATE GROUNDWATER PROJECT



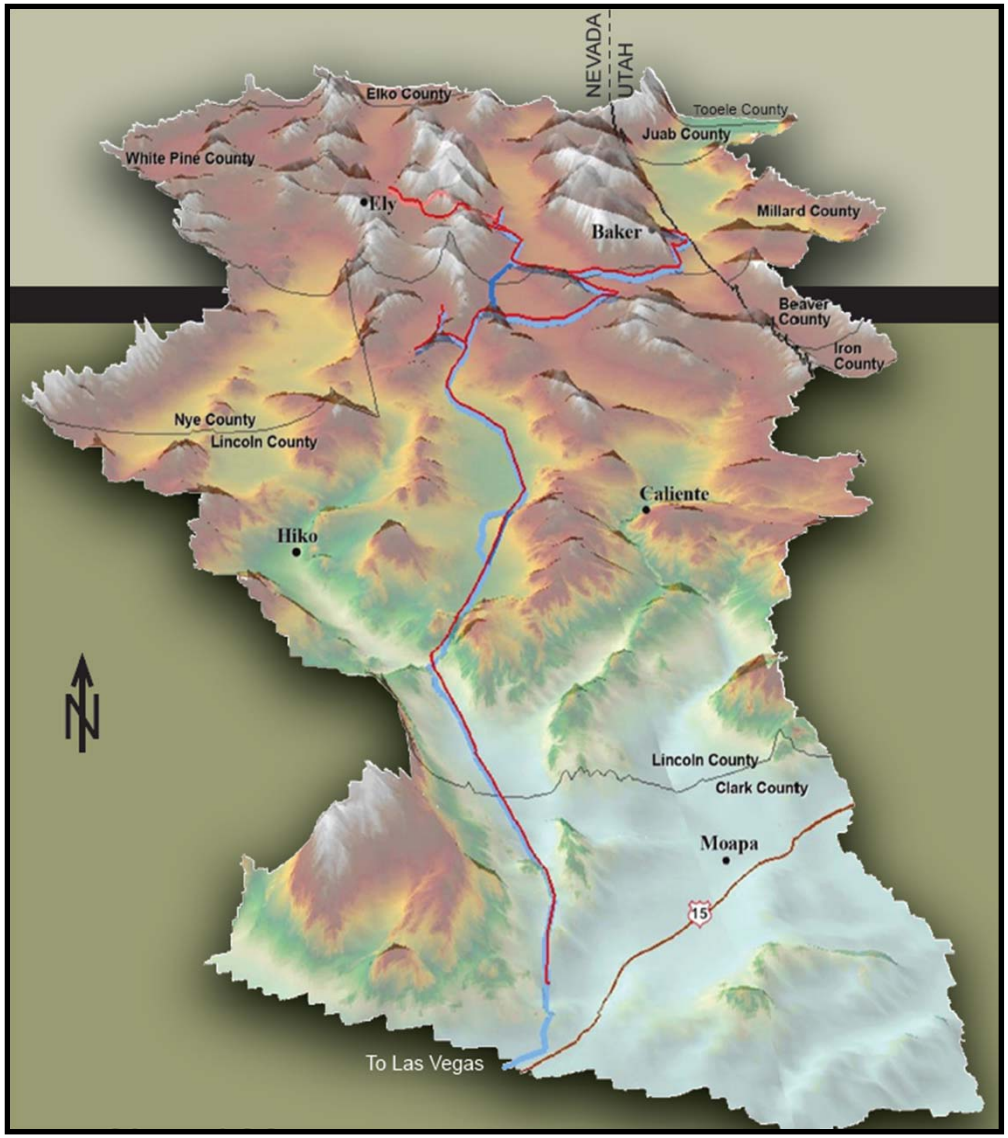
Groundwater Resources

- 92,000 afy of permitted and purchased rights

Primary Facilities

- 260 miles of 16- and 84-inch lateral and main pipeline
- 3 pumping stations
- Five 3-10 million gallon regulating tanks
- 3 pressure reducing stations
- One 40 million gallon buried storage reservoir
- 100 MGD treatment facility
- 272 miles of 230 kV, 69 kV, and 25 kV overhead power lines

IN-STATE GROUNDWATER PROJECT

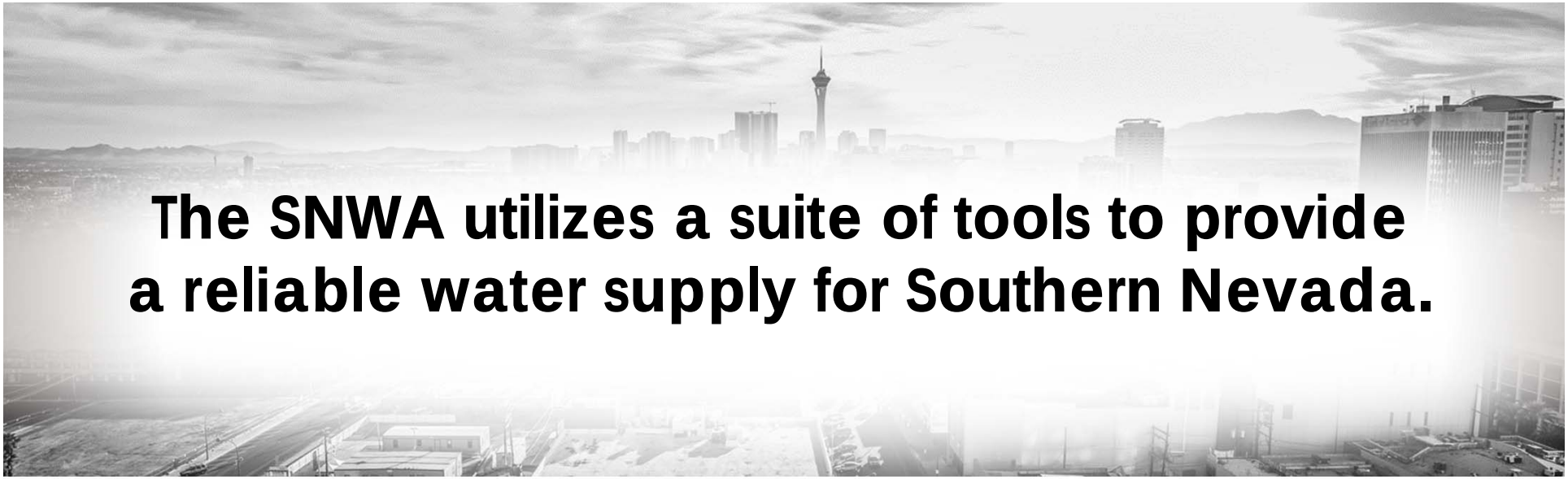


Additional Facilities

- 71 to 88 production wells
- 96-254 miles of 10-30-in diameter collector pipelines
- Two pumping stations
- 96-254 miles of 25 kV overhead power lines
- Hydro turbines at pressure reducing sites

Status

- Groundwater permits issued March 2012
- FEIS issued August 2012
- ROD issued December 2012



The SNWA utilizes a suite of tools to provide a reliable water supply for Southern Nevada.

CONSERVATION

TEMPORARY SUPPLIES

COLLABORATION

INFRASTRUCTURE

NEW RESOURCES

SOUTHERN NEVADA WATER AUTHORITY®