MEETING AGENDA

Southern Nevada Water Authority
Integrated Resource Planning Advisory Committee 2020

Wednesday, January 8, 2020
3:00 p.m.
Colorado River Conference Rooms, Southern Nevada Water Authority
100 City Parkway, Seventh Floor, Las Vegas, Nevada

All items on the agenda are for action by the Advisory Committee, unless otherwise indicated. Items may be taken out of order. The board may combine two or more agenda items for consideration, and the board may remove an item from the agenda or delay discussions relating to an agenda item at any time.

CALL TO ORDER

COMMENTS BY THE GENERAL PUBLIC
NO ACTION MAY BE TAKEN: This is a period devoted to comments by the general public pertaining to items on this agenda. If you wish to speak to the Advisory Committee about items within its jurisdiction, but not appearing on this agenda, you must wait until the "Comments by the General Public" period listed at the end of this agenda. Please limit your comments to three minutes or less. No action may be taken upon a matter not listed on the posted agenda.

1. *For Possible Action*: Approve agenda and minutes from the December 18, 2019 meeting
2. *For Information Only*: Receive an overview of Southern Nevada's water conservation efforts
3. *For Possible Action*: Receive an overview of future water conservation initiatives for Southern Nevada
4. *For Possible Action*: Discuss potential facility, resource and conservation recommendations
5. *For Possible Action*: Review initial financial model assumptions

COMMENTS BY THE GENERAL PUBLIC
NO ACTION MAY BE TAKEN: At this time, the Advisory Committee will hear general comments from the public on matters under the jurisdiction of the Committee. Please limit your comments to three minutes or less. No action may be taken upon a matter not listed on the posted agenda.

THIS MEETING HAS BEEN PROPERLY NOTICED AND POSTED IN THE FOLLOWING LOCATIONS:

City of Boulder City, City Hall
401 California Avenue
Boulder City, NV

City of Henderson, City Hall
240 Water Street
Henderson, NV

Las Vegas Valley Water District
1001 S. Valley View Boulevard
Las Vegas, NV

Clark County Water Reclamation District
5857 East Flamingo Road
Las Vegas, NV

City of North Las Vegas, City Hall
2250 Las Vegas Boulevard North
North Las Vegas, NV

Clark County Government Center
500 S. Grand Central Parkway
Las Vegas, NV

Southern Nevada Water Authority
100 City Parkway
Las Vegas, NV

City of Las Vegas, City Hall
495 South Main Street
Las Vegas, NV

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INTEGRATED RESOURCE PLANNING ADVISORY COMMITTEE 2020
MEETING SUMMARY

December 18, 2019, 3:00 p.m.

Colorado River Conference Rooms, Southern Nevada Water Authority
100 City Parkway, 7th Floor, Las Vegas, Nevada

IRPAC members present:	Ken Evans	Peter Guzman
	Carol Jefferies	Andy Maggi
	Paul Moradkhan	Bob Murnane
	Jonas Peterson	Phil Ralston
	John Restrepo	Virginia Valentine
IRPAC members absent:	Tom Morley	
Staff present:	John Entsminger	Dave Johnson
	Kevin Bethel	Ken Albright
	Andy Belanger	Tabitha Fiddyment
	Peter Jauch	Greg Kodweis
	Zane Marshall	Doa Meade
	Colby Pellegrino	Katie Horn
	Jordan Bunker	
Others present:	Terry Murphy, Facilitator	
	Guy Hobbs, Financial Consultant	

PUBLIC COMMENT
There were no speakers.

SUMMARY OF ACTIVITIES
The Southern Nevada Water Authority's (SNWA) Integrated Resource Planning Advisory Committee 2020 (IRPAC 2020) met on Wednesday, December 18, 2019. The meeting began at 3:04 p.m.

#1 Approve agenda and minutes from the November 20, 2019 meeting. Peter Guzman motioned to approve the agenda and minutes from the November 20th meeting. The agenda and minutes were approved.

At the previous meeting, there was discussion about a potential time change for future committee meetings, but Terry Murphy indicated that there was no desire among the committee to change meeting times.

#2 Receive an overview of the Southern Nevada's water resources. John Entsminger, General Manager, reviewed the total proposed SNWA capital budget from the previous meeting and stated that today's presentation focuses on water resources and that the next meeting will focus on water conservation, and added a $162.3 million contingency for resources and conservation onto the proposed capital budget.

Colby Pellegrino, Director of Water Resources, gave an overview of the SNWA's water resources beginning by reviewing its history, citing the 1922 Colorado River Compact, the 1928 Boulder Canyon Project Act and the Mexican Water Treaty of 1944. She stated that through the 1970s, Southern Nevada relied exclusively on groundwater supplies to meet demands until the Southern Nevada Water System became operational, granting access to Nevada's Colorado River allocation. She discussed the growth in the valley that took place over the next 30 years, which required the use of the Colorado River allocation and the need to look into other water resource options.

Ms. Pellegrino outlined the banking agreements the SNWA has with the states of Arizona and California and reviewed the 2001 Interim Surplus Guidelines. Following adoption of the Interim Surplus Guidelines, drought significantly reduced storage levels in lakes Powell and Mead, underscoring the need for a cooperative approach to drought among the Basin States. Ken Evans asked how long lake levels in Lake Mead have been monitored. Ms. Pellegrino responded that lake levels have been monitored daily since the dam became operational and that only a few years ago, the lake recorded its lowest elevation since it was filled following construction of Hoover Dam. She also discussed the 2007 Interim Guidelines, which addressed several ongoing basin concerns at the time, including shortage volumes and the formation of the Intentionally Created Surplus (ICS) – the ability to store water in Lake Mead. Phil Ralston asked if shortages have caused SNWA to access other water resources. Ms. Pellegrino stated that there has never been a shortage declared on the Colorado River to date, and the SNWA has not had to access or use temporary water resources.

Ms. Pellegrino discussed in more detail ICS as a resource, including Tributary Conservation, Extraordinary Conservation and System Efficiency. She noted that ICS is possible because of the partnerships on the river and serves as an example of how cooperation yields better results than conflict. Mr. Evans asked that if water is being banked, should Lake Mead levels go up. Ms. Pellegrino responded that Lake Mead levels have gone up as a result of these programs, but at today's levels and the size of Lake Mead, it is somewhat insignificant adding roughly only three feet of elevation. The Yuma Desalting plant is one example of a System Efficiency ICS and is the largest brackish desalination plant in the United States. The SNWA received more than 3,000 acre-feet of water from funding a one-year pilot program at the plant. She also highlighted the Brock Reservoir as a System Efficiency ICS project, a project that has provided SNWA with 400,000 acre-feet of water as a temporary resource. Mr. Ralston asked if the water going into Brock Reservoir is water that SNWA plans to save by spending money to put it into storage. Mr. Entsminger clarified that the water going into the reservoir is water that was lost to the system every year but is now being captured because of the reservoir. Ms. Pellegrino went on to highlight the interstate partnerships with Central Arizona Project (CAP) and Metropolitan Water District of Southern California (MET). Ms. Jefferies asked if the Yuma Desalting plant was still in operation to which Mr. Entsminger stated that it is not and SNWA's involvement was only a pilot project.

Ms. Pellegrino gave an overview of Bi-National discussions with Mexico that followed the completion of the 2007 guidelines and reviewed the Minutes that helped frame and establish these negotiations (Minute 316, 317, 318, 319 & 323). There are more than 23,000 acre-feet of Bi-National ICS credits. Mr. Evans asked if the nation of Mexico pays for some of the actions within the Bi-National discussions. Mr. Entsminger stated that Mexico funding doesn't necessarily come to the State of Nevada, but both U.S. federal and Mexican funding goes into the Minutes.

After 14 years of sustained drought, the threat of reaching critical elevations in the Basin's two principal reservoirs had significantly increased. In 2014, the Colorado River Basin states began to evaluate and develop strategies to reduce the risk. The Drought Contingency Plan was forged among the river's users

to reduce the risk of the reservoirs reaching critical elevations. Ms. Pellegrino gave a hydrology update and showed the inflows to Lake Powell from the year 2000 to 2019. Overall, the last 19 years is one of the lowest 19-year period on record, with only 5 years of above average inflows. She also stated that storage within the Basin's two major reservoirs remain less than 50 percent.

Ms. Pellegrino gave an overview of the SNWA's Water Resource Plan which is influenced by various factors such as drought, climate change, economic conditions and adaptive management. SNWA's Water Resource Portfolio includes a diverse set of resource options to reliably meet current and future demands and are labeled as either permanent, temporary of future resources.

Permanent Resources	Temporary Resources	Future Resources
• Colorado River • Unused river water • Tributary Conservation ICS • Groundwater rights	• Southern Nevada banking • Arizona banking • California banking • ICS	• Virgin River / Colorado River augmentation • Desalination • Transfers and exchanges • In-state groundwater

Ms. Pellegrino noted that while groundwater permits are in future resources, they remain subject to on-going litigation. She stated that the SNWA Board has not authorized construction of the project and this Major Construction and Capital Plan (MCCP) amendment does not include funding for constructing the Groundwater Development Project.

The SNWA's Water Resource Plan considers a variety of hydrologic scenarios in its planning efforts. This year, the Water Resource Plan implements four water supply scenarios based upon output from the Bureau of Reclamation's model for managing the river: Average Hydrology, Dry Hydrology, Extremely Dry Hydrology and Climate Change Hydrology. Each hydrology scenario is presented with three different demand scenarios: lower, upper and upper with additional conservation.

Mr. Evans asked if all available land in Southern Nevada was developed, what would be the total in-valley population. Ms. Pellegrino responded that based on CBER's numbers, the lower demand uses 3.2 million people by 2070 and the upper demand uses 3.99 million people by 2070 and added that the CBER model is job-based, not land-based. Mr. Restrepo asked about the community's current GPCD. Ms. Pellegrino stated that the goal is 105 GPCD by 2035 and as of 2018, current GPCD is 113. Mr. Evans stated that our community has done a great job conserving water and asked if there will be a time when we exhaust our conservation efforts and limit development. Mr. Entsminger stated that new water resources, coupled with demand management in conservation, can present scenarios that will not limit development.

#3 Receive an overview of potential new water resources for Southern Nevada that can be developed through Colorado River partnerships. Ms. Pellegrino reiterated the SNWA has been successful working with Colorado River Basin partners to flexibly manage Colorado River resources and that the community must be prepared to take action when an opportunity becomes available, as future projects take time to evaluate, negotiate, fund and construct. The MCCP amendment includes $587 million to fund these types of projects, with a contingency if needed. The SNWA is working to further diversify its water resource portfolio and has identified potential resource options, which include investment in a water recycling project in Southern California, a groundwater desalination project in Yuma, AZ, and/or desalination projects on the coastline.

Ms. Pellegrino gave an overview of Metropolitan's regional Recycled Water Program which is a collaboration between MET and Los Angeles County Sanitation Districts where used water from customers would flow to wastewater treatment plants, and then again to a more advanced water treatment plant. From there, it would be injected into groundwater wells for future use. The total project cost is $3.4 billion to construct and would create approximately 112,000 acre-feet of water per year. Mr. Evans asked about the collaboration with the State of California. Ms. Pellegrino stated that we would partner with MET to help fund a portion of this project in exchange for MET using less of their Colorado River allocation. Mr. Ralston asked if that would become an additional, permanent water resource. Mr. Entsminger stated that he would call it a long-term resource as Southern Nevada would likely require a minimum of 50 years, but that more negotiation is needed if the committee and board greenlight this opportunity. Virginia Valentine asked why California would be interested in other partners. Mr. Entsminger stated that MET would be seeking an additional funder, which would be an incentive.

Ms. Pellegrino introduced the Yuma Desalting Project and reviewed SNWA's involvement in the pilot project and discussed what this might look like as a long-term operational alternative. The project is smaller than the MET project, and would likely yield approximately 30,000 acre-feet per year.

Ms. Pellegrino also introduced the Carlsbad Desalination Plant project as an example of a working desalination plant but noted that the SNWA is not aware of any desalination projects being developed in California where there would be an opportunity for partnership. The existing plant produces 56,000 acre-feet each year.

The committee was shown impacts that these potential new resources would have on Southern Nevada's water supply given various hydrologic and demand scenarios. Mr. Entsminger added that in these scenarios, SNWA is assuming bad hydrology over the next 50 years with more demand, but it also shows that Southern Nevada, through additional water resources and demand management, has the tools to meet that combined challenge.

Mr. Restrepo asked how much water would the SNWA receive if it invested in the MET project. Mr. Entsminger estimated a conservative range of 20,000 to 25,000 acre-feet annually, but it would depend on SNWA's investment into the plant. Ms. Jefferies asked how soon MET customers would have access to the injected water. Mr. Entsminger stated that it would likely take approximately 10 years to permit and build, but once operational it should be immediate as they could use their aquifers as an underground storage and access the water when needed.

MCCP: Water Resources Capital

Future water supplies	$587.7 million
Virgin and Muddy River	98.4 million
Minute 323	36.4 million
Arizona Water Banking	5.5 million
Total Water Supplies	**$728.0 million**
+ Water Smart Landscaping	*152.3 million*
	$880.3 million
+ Resources/Conservation Contingency	$162.3 million
TOTAL MCCP RESOURCES	**$1.04 billion**

Total SNWA Capital

Major Construction and Capital Plan	$3,165.6 million
Facilities	*$2,123.0 million*
Water Supplies	*728.0 million*
Water Smart Landscaping	*152.3 million*
*Resources/Conservation Contingency**	*162.3 million*
Operating Capital	176.7 million
Capital Equipment	50.0 million
Lower Las Vegas Wash	122.5 million
TOTAL SNWA CAPITAL	**$3.51 billion**

Mr. Entsminger stated that the SNWA will seek recommendations from the committee about moving forward with these potential new water resources with an intent to have further discussions with MET in the March/April 2020 timeframe. He stated that, if the committee agrees, staff will continue to gather information on the MET project. Mr. Evans asked about California's commitment to water conservation. Mr. Entsminger stated that MET, with a population of 19 million people, is using approximately the same amount of water as they used in 1990, so they are doing a good job in water conservation. Mr. Ralston assumes these types of initiatives would have rate impacts and implications and stated that perhaps that information be available and presented before making recommendations. Mr. Entsminger asked if the committee would like to receive financial modeling on how funding a future resource of this magnitude would look like, to which the committee agreed.

Peter Guzman asked about the economic impact and job creation impact these new projects would have on Southern Nevada. Mr. Entsminger stated that these types of projects help stabilize our water resources and that is the impact they have on the community, with water resource uncertainty coming as early, potentially, as 2050.

Ms. Murphy summarized by stating that in a future committee meeting staff will present funding scenarios that will show how to pay for these potentially new resource projects. She closed the meeting and stated that the next meeting will be held January 8th.

PUBLIC COMMENT

Ed Uehling stated that the water resource alternatives presented by SNWA staff, such as desalination plants, are better options than the in-state groundwater development project. He also presented water conservation alternatives and ideas, and suggested expanding the tiered water system.

ADJOURNMENT

The meeting was adjourned at 4:59 p.m.

CONSERVATION

JAN 8, 2020

SOUTHERN NEVADA WATER AUTHORITY™

CONSERVATION HISTORY

The SNWA was formed in 1991 to manage existing and future water supplies, construct and operate regional water facilities, and promote water conservation.

1991-1999:

- SNWA makes conservation an organizational priority and begins work to develop its first conservation plan (1992)
- IRPAC makes conservation recommendations and SNWA adopts a goal of 25% conservation by 2010 (1994)
- SNWA hires its first Conservation Manager and member agencies agree to implement conservation and efficiency measures defined under a Conservation Memorandum of Understanding (1995)
- SNWA begins Xeriscape Conversion Study (1995) to determine water savings potential
- SNWA launches the Water Smart Landscapes Program (1999)

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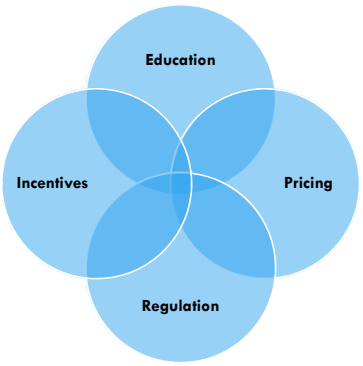
CONSERVATION HISTORY

2000 - 2019:

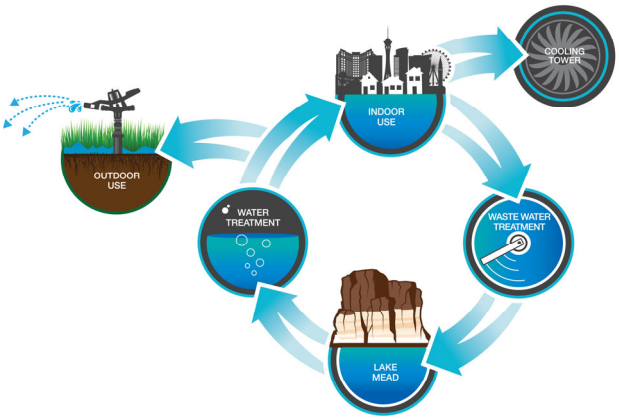
- SNWA and member agencies adopt the SNWA Drought Plan (2003)
- SNWA achieves its conservation goal and forms IRPAC to make conservation/resources recommendations (2004)
- SNWA adopts a new conservation goal (2005)
- SNWA works with member agencies to permanently implement major demand reduction tools identified in the SNWA Drought Plan (2006)
- IRPAC makes recommendations and supports ongoing efforts to achieve SNWA's current conservation goal (2014)
- SNWA Board approves the Out-of-Valley Reuse Policy (2017)
- SNWA updates its Conservation Plan, launches new incentive programs and makes continued investments in its Water Smart Landscapes Program (2004-2019)
- SNWA Board approves a non-functional turf resolution (2019)



3

CONSERVATION

Southern Nevada receives return-flow credits for water that is treated and returned to Lake Mead.



Reducing consumptive water use is an ongoing priority.

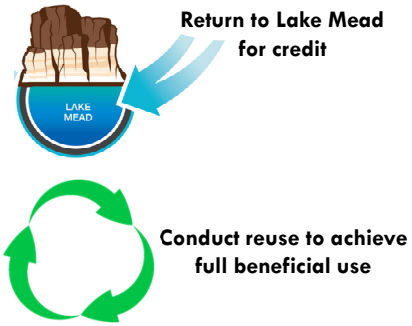
4

OUT-OF-VALLEY WATER USE POLICY

The SNWA Board adopted the policy to maximize regional water supplies used for out-of-valley development.

Key Principles:

- Return treated wastewater to Lake Mead for return-flow credits whenever feasible.
- Achieve full beneficial use of water through direct or indirect recycling/reuse when returning water to Lake Mead is not feasible.
- Adopt service rules and development codes that rely on industry best practices to minimize consumptive use of water resources.
- Treat wastewater to levels sufficient for reuse.



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OUT-OF-VALLEY WATER USE POLICY

The SNWA Board adopted the policy to maximize regional water supplies used for out-of-valley development.

Key Principles (Cont.):

- Implement localized, beneficial direct reuse within the development area (industrial, commercial, schools, parks) where feasible to displace the need for SNWA resources.
- Implement aquifer storage and recovery programs where feasible.
- Prohibit inefficient water uses, for example:
  - Aesthetic uses of water
  - Manmade lakes
  - Wet-cooled power generation
  - Spray turf irrigation (except for schools & parks)
- Limit the use of evaporative coolers.

LVVWD recharge well.

6

CONSERVATION OPPORTUNITY

Make changes needed to implement the Out-Of-Valley Water Use Policy consistently across the SNWA member agency service area.

CONSERVATION PLAN REVIEW

The SNWA conservation plan describes current water management measures.

- Universal metering
- Incentive pricing and billing
- Water loss management
- Development codes and policies
- Water waste enforcement
- Water efficiency standards
- Water reuse
- Water pressure management





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CONSERVATION PLAN REVIEW

It also details several new efforts that have been implemented since the last update.

New strategies:

- Reduce outdoor irrigation (no Sunday watering)
- Increase water waste enforcement
- Increase water efficiency standards
- Expand water loss programs
- Maximize reuse outside the Las Vegas Valley
- Boost participation in WSL and WET programs
- Target median/streetscape turf removal
- Replace cool season grasses (parks/schools)
- Offer rebates for leak detection
- Offer site appraisals to high water users

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CONSERVATION PLAN REVIEW

The Plan also describes education and outreach efforts.

Advertising, Publications & Media

- Television, print & radio
- Interactive website (snwa.com)
- Water Ways
- Videos and multimedia
- Social media

Community Partnerships

- Water Smart Home
- Water Smart Contractor
- Water Conservation Coalition
- Water Upon Request
- WaterStart Partner

Education, Engagement & Support

- WaterSmart Innovations
- Youth education & school grants
- Conservation Helpline
- Classes and community events
- Demonstration gardens

Plan implementation is estimated to yield a 3.42 GPCD water savings by 2035.

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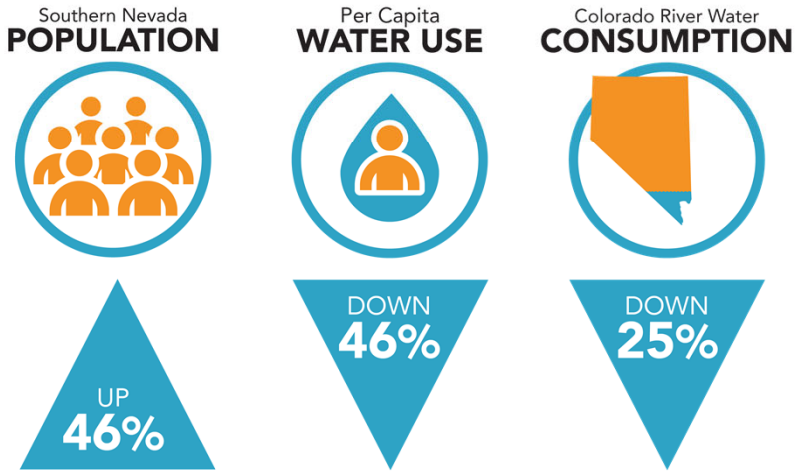
CONSERVATION PLAN REVIEW

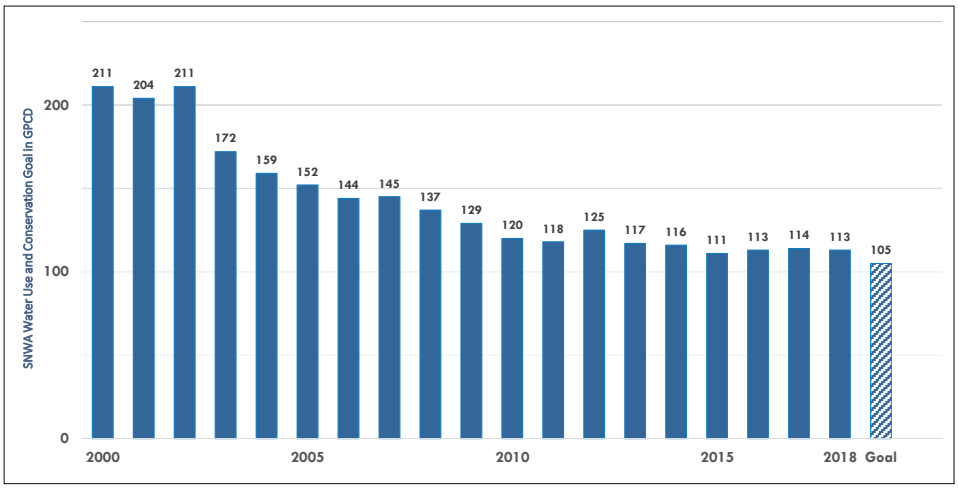
Water use has declined significantly since 2002, but continued conservation remains a priority.



11

CONSERVATION PLAN REVIEW

Conservation gains have been relatively flat in recent years.



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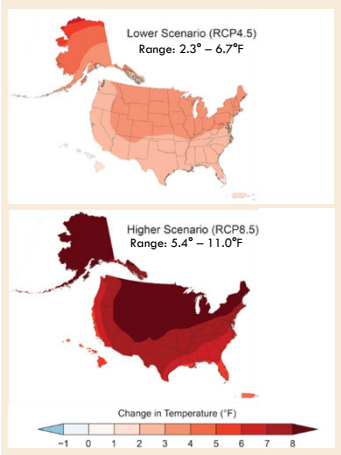
CONSERVATION & CLIMATE CHANGE

Climate change is expected to have a lasting effect on water supply and demand, both locally and regionally

Observations and Findings:

- Global mean air temperatures have warmed by1.8°F from 1901 to 2016 and by 1.2°F between1986 and 2015.
- 16 of the last 17 years have been the warmest ever recorded by human observations.
- Average annual temperature over the contiguous U.S. is projected to increase by about 2.2°F relative to 1986-2015 over the next few decades. Much larger increases are projected by late century.
- Clark County is projected to warm between 5-10°F by the end of the century.



Projected Changes in Temperature (Late 21st Century)

13

CONSERVATION & CLIMATE CHANGE

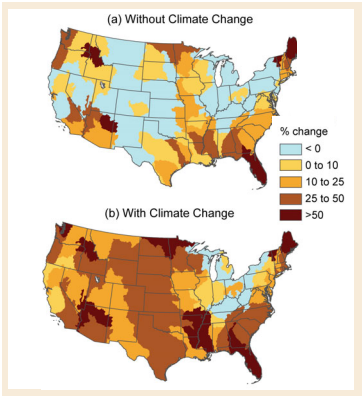
Climate change is expected to have a lasting effect on water supply and demand, both locally and regionally

Water Supply Impacts

- Large declines to snowpack & decreased precipitation
- Decreased soil moisture & increased evaporation
- Stronger, more frequent & potentially longer droughts

Water Demand Impacts

- Higher plant water needs due to increased evapotranspiration
- Increased water demands for evaporative cooling
- Increased demands for pools & water features/evaporation



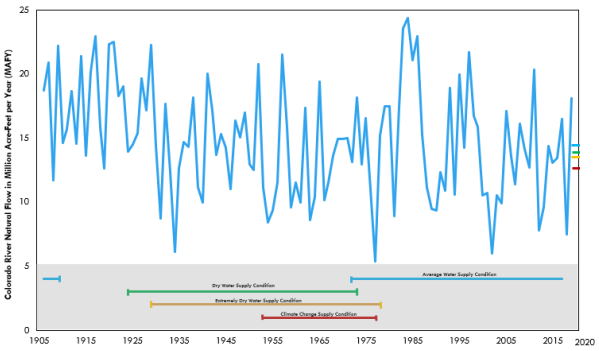
Projected Changes in Water Withdrawals (2005 – 2060)

14

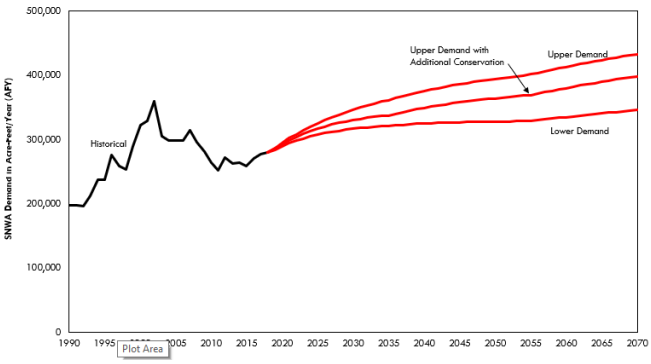
CONSERVATION & CLIMATE CHANGE

SNWA updated its Water Resource Plan in 2019 to include possible changes in supply and demand.

Variable Supply Conditions



Variable Demands



The plan assumes we achieve our current conservation goal of 105 GPCD by 2035.

15

CONSERVATION & CLIMATE CHANGE

We will have to work harder to reach our conservation goal with upward pressure from climate change and system age.

Climate Change & Aging System

Increasing consumptive water demands due to warmer temperatures, drier soils lower precipitation, and increased system loss due to aging infrastructure.

Adaptive Management

Significant additional effort will be required to reduce consumptive water use to meet our conservation goal and maximize the availability of water supplies.

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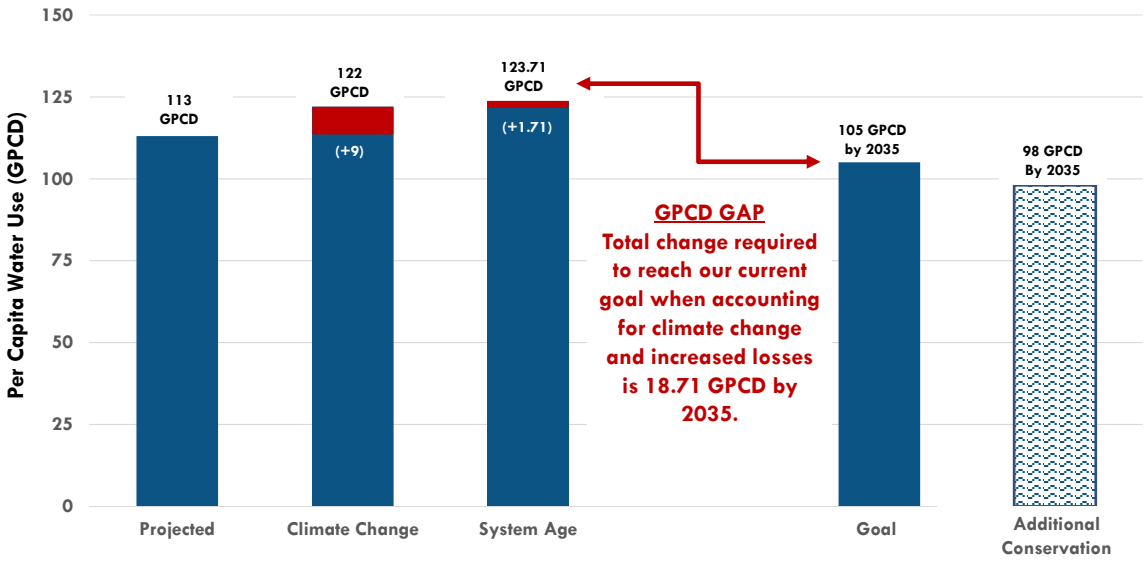
SNWA CONSERVATION GOAL CONSIDERATIONS



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CONSERVATION PLANNING

The SNWA formed an internal workgroup to consider new conservation opportunities.

Workgroup Goals:

- Improve enforcement, compliance and water efficiency through internal and interagency coordination.
- Leverage information technology and analytics to improve knowledge and tools through data sharing and expansion of information technology systems.
- Enhance internal communications and coordination through performance tracking, information sharing and employee engagement.
- Advance conservation outreach via public and consumer communications by utilizing market-based data and existing and emerging communication tools to reach targeted audiences and achieve measurable results.

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CONSERVATION PLANNING

The SNWA formed an internal workgroup to consider new conservation opportunities.

Workgroup Goals (cont.):

- Use consumer research to improve water efficiency in the community.
- Expand our understanding of supply and demand and water consumption through specialized research on select topics.
- Implement pricing signals/use rates to help maximize efficiency from water users while meeting revenue requirements.
- Influence and effect land use planning policy to reduce consumptive water use in development.
- Improve system efficiency and reduce loss through infrastructure and operational improvements.

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HIGH-IMPACT CONSERVATION OPPORTUNITIES

Reducing consumptive water use remains a high priority.

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NON-FUNCTIONAL TURF

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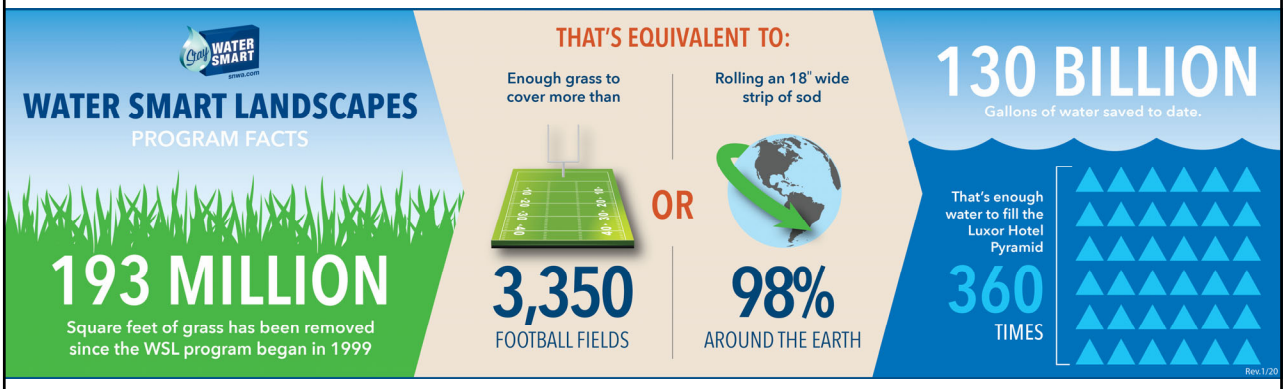
NON-FUNCTIONAL TURF REMOVAL

The SNWA has made significant strides in removing non-functional turf.



WSL rebates paid since program inception: $234.4 million

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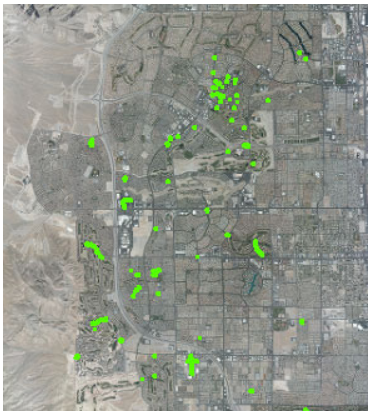
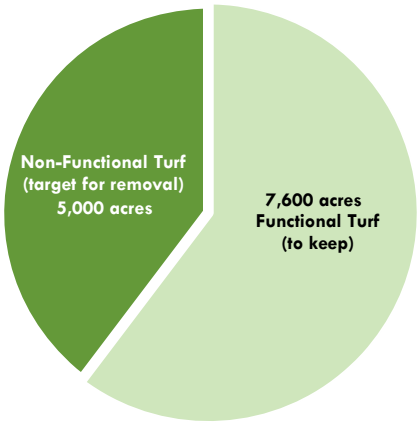
NON-FUNCTIONAL TURF REMOVAL

Removing the remaining non-functional turf in our community will require continued investment.



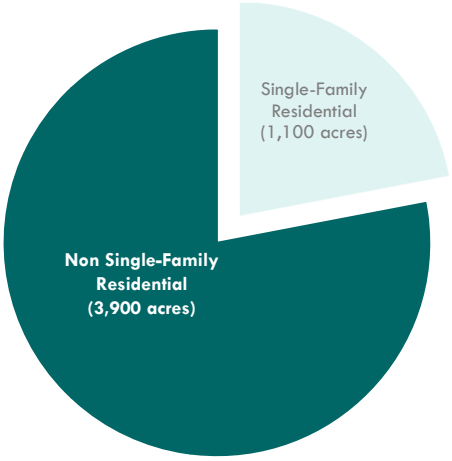


$152.3 million is proposed in the MCCP amendment to fund Water Smart Landscapes program.

23

NON-FUNCTIONAL TURF REMOVAL

The largest opportunities for non-functional turf removal are outside the single-family residential sector.



Remaining Non-Functional Turf by Sector

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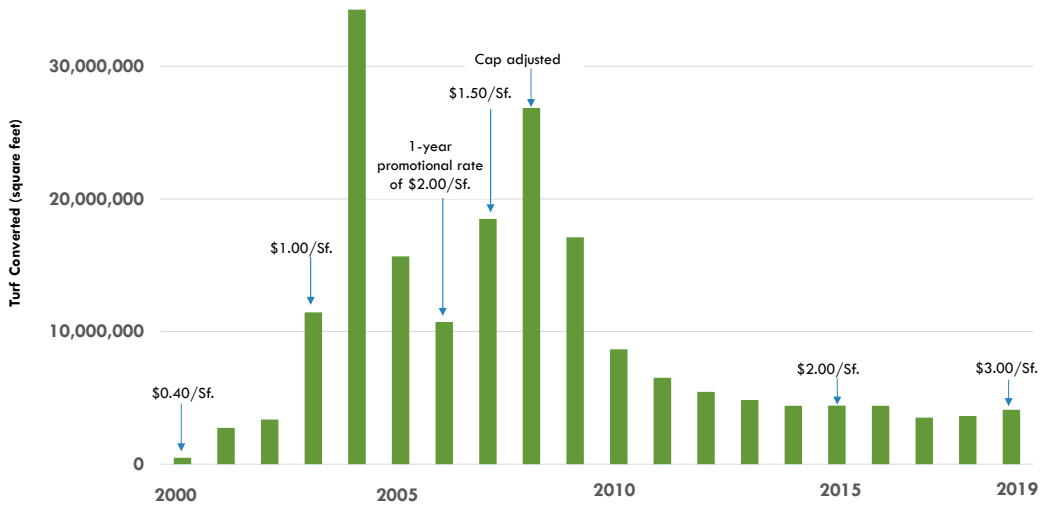
NON-FUNCTIONAL TURF REMOVAL

Under current WSL program participation rates, we are removing approximately 1% of available non-functional turf per year.



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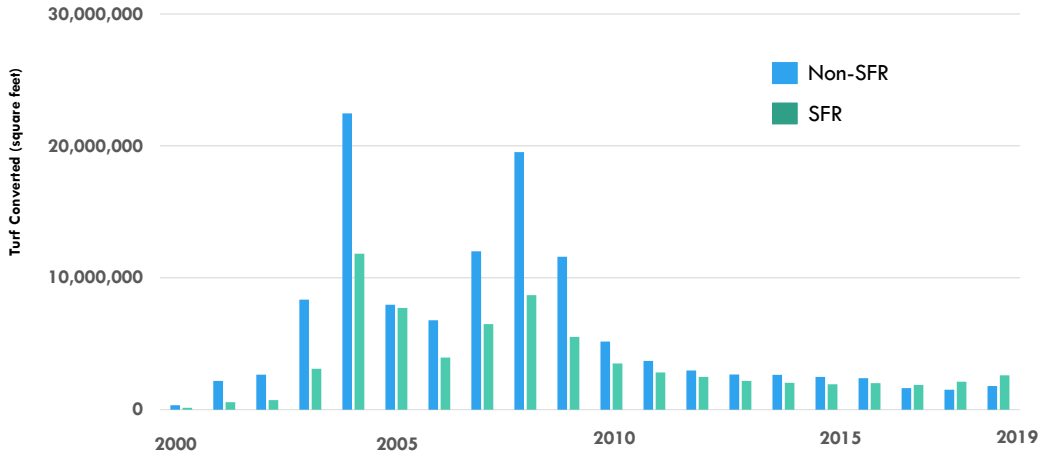
NON-FUNCTIONAL TURF REMOVAL



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NON-FUNCTIONAL TURF REMOVAL

SNWA approved a suite of program changes that allow funding to support other types of non-SFR non-functional turf replacement.

Examples:

- Splash pads connected to the sanitary sewer
- Artificial turf/alternate surfacing
- Playground equipment
- Sports courts (tennis, basketball, etc.)

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NON-FUNCTIONAL TURF REMOVAL

Conservation Opportunities:

- Remove non-functional turf in existing master planned communities and at commercial properties.
- Prevent non-functional turf installation as allowed under existing developer agreements.

Strategies:

- Identify and remove barriers to WSL program participation
- Increase incentives/make other program changes
- Make changes to service rules, codes/ordinances
- Consider mandatory retrofit for commercial properties
- Conduct targeted outreach
- Evaluate pricing signals

Increasing WSL conversions by 56 acres per year through 2035 (using 2019 as a baseline) could yield a 4.46 GPCD savings.

CONSERVATION OPPORTUNITY

Make changes needed to reduce non-functional turf acreage by 50 percent by 2035.

FUNCTIONAL TURF

FUNCTIONAL TURF RESTRICTIONS

SNWA recently adopted a resolution to address non-SFR functional turf in new development.

The installation of turf on public and private parks and schools is limited to active or programmed recreation areas such as sport fields.

- Not less than 1,500 contiguous square feet of grass
- Not less than 30 feet of grass in any dimension
- No grass closer than 10 feet to a street
- No grass in front of entryways to residential neighborhoods or subdivisions where other recreational amenities do not exist
- Not to exceed 25% slope to prevent runoff, except in designated drainage areas

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CONSERVATION OPPORTUNITY

Update service rules, codes and ordinances to consistently implement new turf restrictions across the SNWA member agency service area.

FUNCTIONAL TURF REPLACEMENT

SNWA's incentive program also supports the conversion of functional cool-season turf to more water-efficient varieties.

Henderson Parks Conversion:

- Agreed to convert more than one million square feet cool-season turf to warm-season turf through SNWA's WET program.
- The estimated water savings is 22 million gallons of water annually.
- Four parks were converted in 2019 and were ready for play within one to two weeks of conversion.

City of Henderson Park Conversion (2019)

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FUNCTIONAL TURF REPLACEMENT

Conservation Opportunities:

- Convert parks and schools to warm season turf.
- Require use of warm season grasses in functional turf installations.

Strategies:

- Conduct targeted outreach
- Increase incentives/make other program changes
- Make changes to service rules, codes/ordinances
- Consider mandatory retrofit

Converting functional cool-season turf to warm-season turf in public spaces could yield a 0.30 GPCD savings.

CONSERVATION OPPORTUNITY

Limit future installations of cool-season turf in public spaces and expedite the conversion of cool-season turf to warm-season turf at existing public facilities.

LANDSCAPE WATERING COMPLIANCE

LANDSCAPE WATERING COMPLIANCE

Improving compliance with seasonal watering restrictions remains a high priority.

Current seasonal compliance rates range from less than 25% to approximately 60%.

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LANDSCAPE WATERING COMPLIANCE

SNWA has increased education, advertising and outreach efforts.

Key Efforts:

- TV, radio and billboard ads
- Direct mail and other publications
- Social media and online videos
- Landscaper outreach
- Speaker engagements
- Bill inserts/bill messaging*
- Direct violator outreach (pilot)*

*Member agency initiatives

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LANDSCAPE WATERING COMPLIANCE

LVVWD is expanding a pilot study to increase compliance with seasonal watering restrictions.

Pilot Study:

- LVVWD used ITRON meter data to identify Sunday watering offenders.
- Conducted direct outreach to 500 offenders.
- Observed a 47% change in behavior compared to the control group.
- LVVWD is expanding the pilot to include all compliance periods.
- Increasing outreach from 500 to top 5,000 non-compliant SFR customers.

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LANDSCAPE WATERING COMPLIANCE

Current Compliance Challenges:

- Increased outreach results in higher call volumes/customer care needs
- Data delays due to meter reading frequency
- Constant and changing messaging is required
- Different meter systems across member agencies

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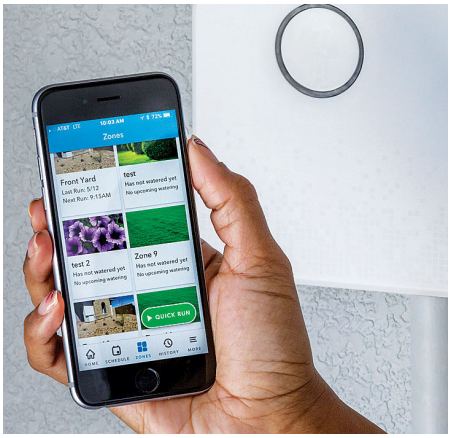
LANDSCAPE WATERING COMPLIANCE

Conservation Opportunities:

- Increase compliance with full-scale deployment of smart controllers (automated time-of-day & day-of-week compliance) and expanded advertising and outreach.

Strategies:

- Work with controller industry to develop a customized package for SNWA
- Increase incentives/make other program changes
- Make changes to service rules, codes/ordinances
- Consider mandatory retrofit of existing controllers
- Use technology for direct and real-time notifications
- Increase advertising and outreach efforts



Achieving maximum predicted compliance could yield a 5.05 GPCD water savings.

CONSERVATION OPPORTUNITY

Implement smart controller technology to automate landscape watering compliance and increase outreach and enforcement efforts to facilitate participation from current and future customers.

CUSTOMER LEAKS

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CUSTOMER LEAKS

LVVWD is using meter data to identify possible leaks and to alert customers.

LVVWD Leak Outreach

- LVVWD's system generates a trickle report when a customer's meter registers continuous water use (24-hours/day for 7 consecutive days).
- LVVWD issues letters to alert customers to potential problems.
- Excessive leaks (1,500 gallon+ average daily use) follow a similar process and can result in a water waste fee if not resolved.
- LVVWD's Water Waste Team also makes outbound calls to customers with major irrigation malfunctions (when observed).

Slow leaks aren't always visible and can generate significant water loss.

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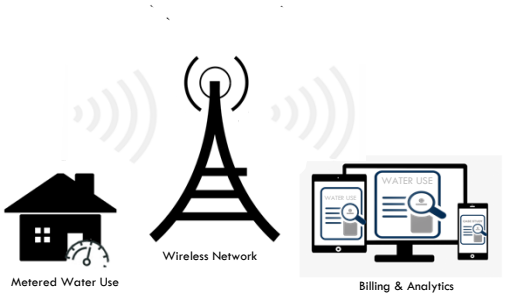
CUSTOMER LEAKS

LVVWD is implementing new metering and billing technology that will provide real-time water use information and analytics.

Automated Metering Infrastructure (AMI)

- High-resolution data is collected in real-time.
- Customers can see water usage online.
- Allows for tailored customer communications.
- Faster resolution of compliance and leak issues.
- LVVWD deployment is scheduled for 2021.



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CUSTOMER LEAKS

Conservation Opportunities:

- Reduce the lag in customer leak notification.
- Deploy smart leak detection technology in new development.

Strategies:

- Work with SNWA member agencies to deploy technology/improve leak notification processes
- Develop a leak assistance program to help offset customer costs
- Develop industry partnerships to expedite repairs (e.g. "smart plumber program")
- Use technology for direct and real-time notifications

Service Line Leak

Providing near real-time leak notification using AMI technology could yield a 4.97 GPCD water savings.

CONSERVATION OPPORTUNITY

Pursue implementation of advanced metering infrastructure to allow for near real-time notification of customer leaks and develop partnerships and programs to improve the speed of customer leak repairs.

COOLING TECHNOLOGIES

COOLING TECHNOLOGIES

Evaporative cooling is the second largest consumptive use of water in Southern Nevada.

Evaporative Cooling:

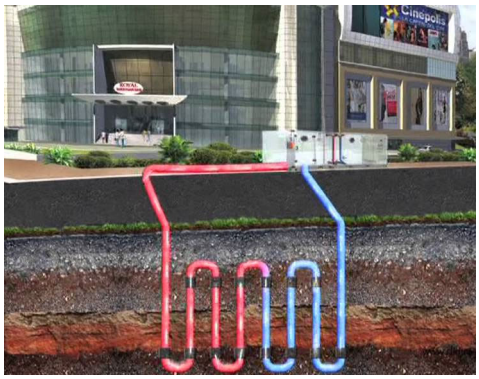
- Cools air through the evaporation of water.

Geothermal Cooling:

- Recirculates process water through underground pipes to shed heat and reduce evaporative loss.

Single Pass Cooling:

- Discharges used cooling water to the sanitary sewer where it can be captured for return-flow credits.



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COOLING TECHNOLOGIES

LVVWD is exploring the conversion of an evaporative cooling system at its Valley View campus to single-pass thermal.

Conversion Details:

- Installed a submeter to establish a baseline and to track post-conversion water use data.
- Analyzing options and benefits of conversion.
- If data supports a conversion, the retrofit will be scheduled for completion before summer 2020.
- Will monitor post-conversion water use to track water use savings.

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COOLING TECHNOLOGIES

Evaporative cooling is the second largest consumptive use of water in Southern Nevada.

Evaporative Coolers & Cooling Towers

- Water is lost from evaporation and "drift" in the cooling process.
- Drift elimination technology reduces water loss, but requires ongoing maintenance/repacking (loses efficiency over time).
- Alternative cooling technology includes single pass thermal, dry thermal and geo thermal.

Evaporative Cooler and Drift Eliminators

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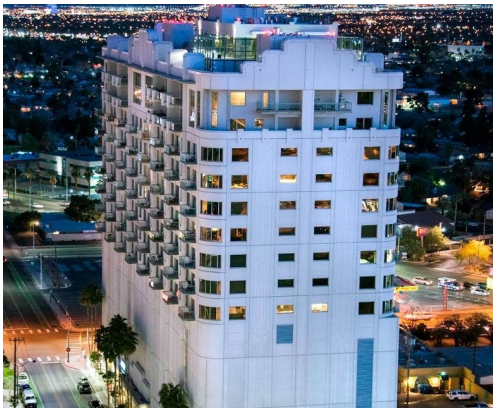
COOLING TECHNOLOGIES

Current incentive programs (WET) support cooling tower replacements/upgrades for consumptive use reductions.

2009 Evaporative Cooling Replacement
Consumptive savings: ~164,000 gallons/year



2019 Cooling Tower Upgrade
Consumptive savings: ~234,000 gallons/year

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COOLING TECHNOLOGIES

Conservation Opportunity:

- Improve the efficiency of existing cooling facilities and reduce cooling consumptive water loss in new development.

Strategies:

- Increase incentives/make other program changes
- Make changes to service rules, codes/ordinances for maintenance/replacement of drift elimination technology
- Research cooling alternatives for use in new development such as single pass thermal, dry thermal and geo thermal and conduct pilot testing to evaluate savings
- Use pricing/incentives to encourage efficient technology/ disincentivize evaporative cooling
- Conduct more cooling technology pilot programs

Evaporative Cooling Tower

Reducing consumptive water loss from evaporative cooling by 20 percent could yield a 2.23 GPCD water savings.

CONSERVATION OPPORTUNITY

Implement changes necessary to reduce current and future consumptive water losses associated with evaporative cooling technology.

HIGH WATER USE ASSESSMENT

EFFICIENCY REVIEW POLICY

SNWA implements strategies to improve efficiency among large water users.

Golf Course Water Budgets:

- Golf courses are subject to mandatory water budgets (6.3 acre-feet per irrigated acre).
- Customers pay fees for water in excess of budgeted amounts.

Resort Efficiency Plans:

- Resorts must submit water efficiency plans that are subject to review by SNWA.
- SNWA recommends efficiency improvements and identifies opportunities to reduce consumptive use.

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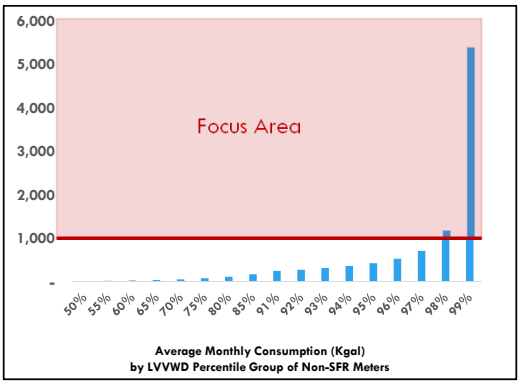
EFFICIENCY REVIEW POLICY

Conservation Opportunity:

- Participate in planning/review/approval processes to reduce consumptive water use in future development.

Strategies:

- Make changes to service rules, codes/ordinances requiring an efficiency review for new development (targeting top 2% of highest water users)
- Recommend or mandate efficiency improvements/opportunities to reduce consumptive use
- Use pricing/incentives to encourage efficient technology/disincentivize consumptive use



Establishing an efficiency review policy for new large water users could yield a 1.09 GPCD water savings.

CONSERVATION OPPORTUNITY

Establish an efficiency review policy and process for new large water users to encourage efficient development and disincentivize consumptive use.

SYSTEM LOSS

ASSET MANAGEMENT

Southern Nevada's water system is highly efficient.

- Current water loss rates are well below industry norms.
  - SNWA: ~ 1%
  - LVVWD: ~5%
  - U.S. Average: ~16%
- Maximizing system efficiency is a top priority.
  - Deploy advanced leak detection, including new and emerging technologies
  - Utilize risk model to prioritize work efforts
  - Proactively replace older infrastructure
  - Conduct soil testing prior to facility installation
  - Conduct regular inspections to ensure integrity of assets
  - Use special monitoring to detect and report leakage

West Valley Lateral Leak Repair

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ASSET MANAGEMENT

Conservation Opportunity:

- Water systems across the nation are experiencing increasing water loss rates due to system age.
- Address system age, construction materials and environmental factors that can influence pipeline/asset performance over time.

Strategies:

- Continue to evaluate system needs/conduct water loss audits and update asset management/replacement plans
- Continue to fund or increase funding for systems loss management across SNWA member agency service area
- Continue to research and test advanced technologies
- Develop shared resources for regional leak detection efforts

System Reservoir

Continued emphasis on asset management could yield a 1.7 GPCD savings over time.

CONSERVATION OPPORTUNITY

Continue to make investments that will maintain or improve the existing water loss rates among wholesale and retail water purveyors.

PUBLIC OUTREACH

ADVERTISING AND OUTREACH

SNWA launched a new major compliance campaign in 2019.

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ADVERTISING, OUTREACH & ENGAGEMENT

SNWA is exploring other opportunities to reduce water use and reach our target audience.

Description	Annual Average Estimated Water Savings	Annual Average Estimated Cost
Raiders Sponsorship	900 million gallons	$2.5 million/year (10 year commitment)
Outreach Augmentation	900 million gallons	$2.08 million/year
Enhanced Compliance	1.2 billion gallons	$2.39 million/year
Expanded Non-SFR Engagement	1.7 billion gallons	$2.5 million/year
Water Loss Mitigation	700 million gallons	$2.5 million/year

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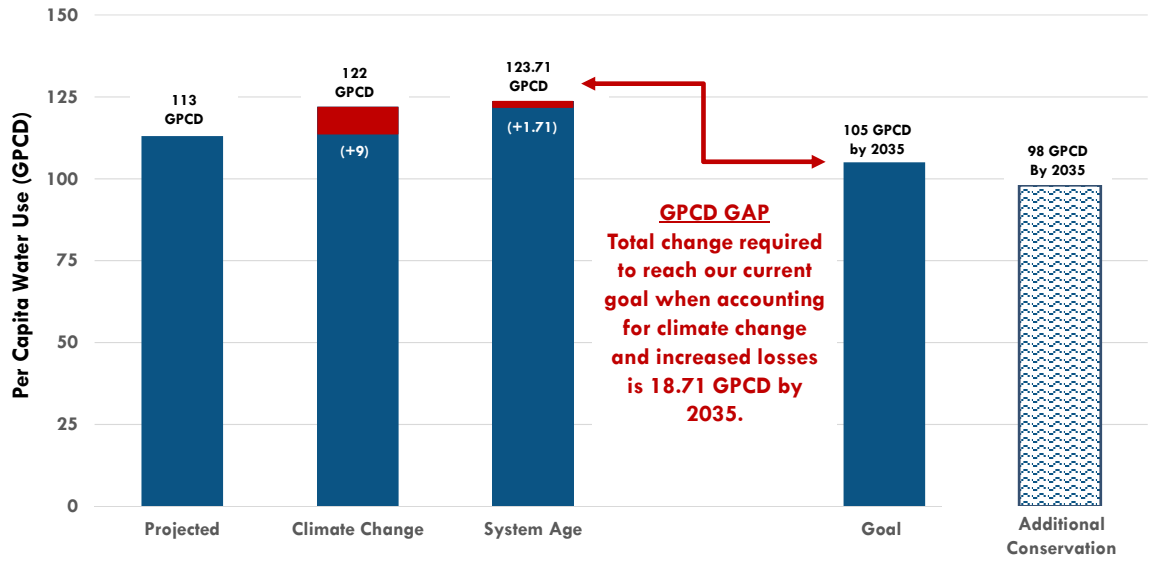
CONSERVATION OPPORTUNITY

Continue outreach efforts to engage the public and effectuate the changes needed to meet the community's regional conservation goal.

SNWA CONSERVATION GOAL CONSIDERATIONS



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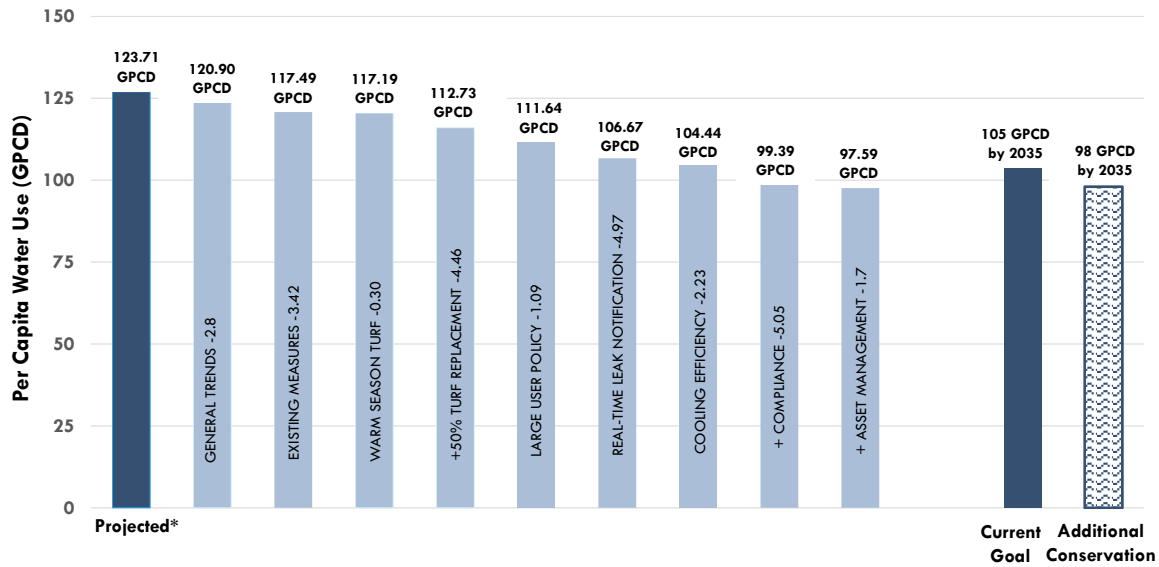
SNWA CONSERVATION GOAL CONSIDERATIONS



*With climate change & system loss

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CONSERVATION OPPORTUNITY

Pursue changes necessary to achieve the SNWA's current water conservation goal of 105 GPCD by 2035 and further efforts to achieve additional conservation thereafter.

FINANCIAL MODEL ASSUMPTIONS

TOTAL CAPITAL COST ASSUMPTIONS

Horizon Lateral	$1,596.7 million	
Garnet Valley Water System	129.8	
Garnet Valley Wastewater System	120.0	
Boulder City Wastewater System	26.0	
Solar PV Project	20.8	
Asset Management	229.7	
Total MCCP Facility Projects		**$2,123.0**
Future Water Supplies	587.7	
Virgin & Muddy River Water	98.4	
Minute 323	36.4	
Arizona Water Banking	5.5	
Total MCCP Water Supplies		**$728.0**
Water Smart Landscaping		**152.3**
Resources/Conservation Contingency		**162.3**
TOTAL MCCP EXPENDITURES AS PROPOSED		**$3,165.6**
Operating Capital		176.7
Capital Equipment		50.0
Lower Las Vegas Wash		122.5
TOTAL CAPITAL		**$3,514.8 million**

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RATE MODEL ASSUMPTIONS

Variable	Starting Point
Capital Costs	$3.5 billion as presented
CPI Index	25-year annualized average of CPI's Western Cities Class A 2.5 percent
ENR (Engineering News Record)	25-year annualized average of the ENR's Construction Cost Index 3.0%
Population (Growth)	CBER's population growth rate
Interest on New Debt	Commonly-used index rate adjusted for SNWA
Reserve Policy	SNWA Board adopted policy

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RATE MODEL SOURCES

Source Description	Used For	Collected By	Last Changed
Wholesale Delivery Charge	Daily operations and maintenance, administrative costs, maintenance of reserve funds	SNWA Paid by purveyor members	Jul. 2019
Infrastructure Charge	Capital and Debt Service	SNWA Purveyor Members via customer bills	Jan. 2018
Commodity Charge	Capital and Debt Service	SNWA Purveyor Members via customer bills	Jan. 2017
Connection Charges	Capital and Debt Service	SNWA Purveyor Members via new connection fees	Nov. 2008
Groundwater Management Fees	Groundwater Management Program	SNWA via well users	
Las Vegas Wash Program Fees	LV Wash / Program Fees	SNWA	
Reliability Surcharge	Capital & Debt Service	SNWA Purveyor Members via customer bills (statutory limit of .25% for residential and 5% for commercial)	
Bond Proceeds	Major Construction & Capital Plan		
Sales Tax Proceeds	LV Wash / Capital & Debt Service	State of Nevada, transmitted to SNWA	

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RATE MODEL SCENARIOS

Additional Scenarios beyond the Baseline:

Funding Ratio Options

- 100% Debt / 0% Pay-Go
- 75% Debt / 25% Pay-Go
- 50% Debt / 50% Pay-Go

Other Scenarios

- MCCP without $162.3 million for contingency
- Others for discussion

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SAMPLE CUSTOMERS

Residential

- Single Family Residential (Typical Use)
- Single Family Residential (High Use)
- Mobile Home
  BOULDER CASCADE
- High Rise Residential
  QUEENSRIDGE PLACE
- Apartment Complex
  FOOTHILL VILLAGE

Non-Residential

- Office Park
  DESERT CANYON
- Major Gaming Resort
  BELLAGIO
- Stand-alone Restaurant
  LAWRYS
- Shopping Mall
  FASHION SHOW MALL
- School
  PALO VERDE HIGH SCHOOL
- Municipal Park
  ALL-AMERICAN

Non-Residential, cont.

- Hospital
  SUNRISE HOSPITAL
- Off Strip Gaming Resort
  PALACE STATION
- Warehouse (low use)
  BALDWIN MOTORSPORTS
- Industrial
  BRADY LINEN
- Shopping Center
  RENAISSANCE WEST

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SOUTHERN NEVADA WATER AUTHORITY™