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DEPARTMENT OF UTILITY SERVICES



Reclaimed Water Infrastructure On Track

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Henderson, Nevada

- Incorporated in 1953
- 2008 Population: 270,000
- Service Area: 104 square miles



Primary Water Source: Lake Mead

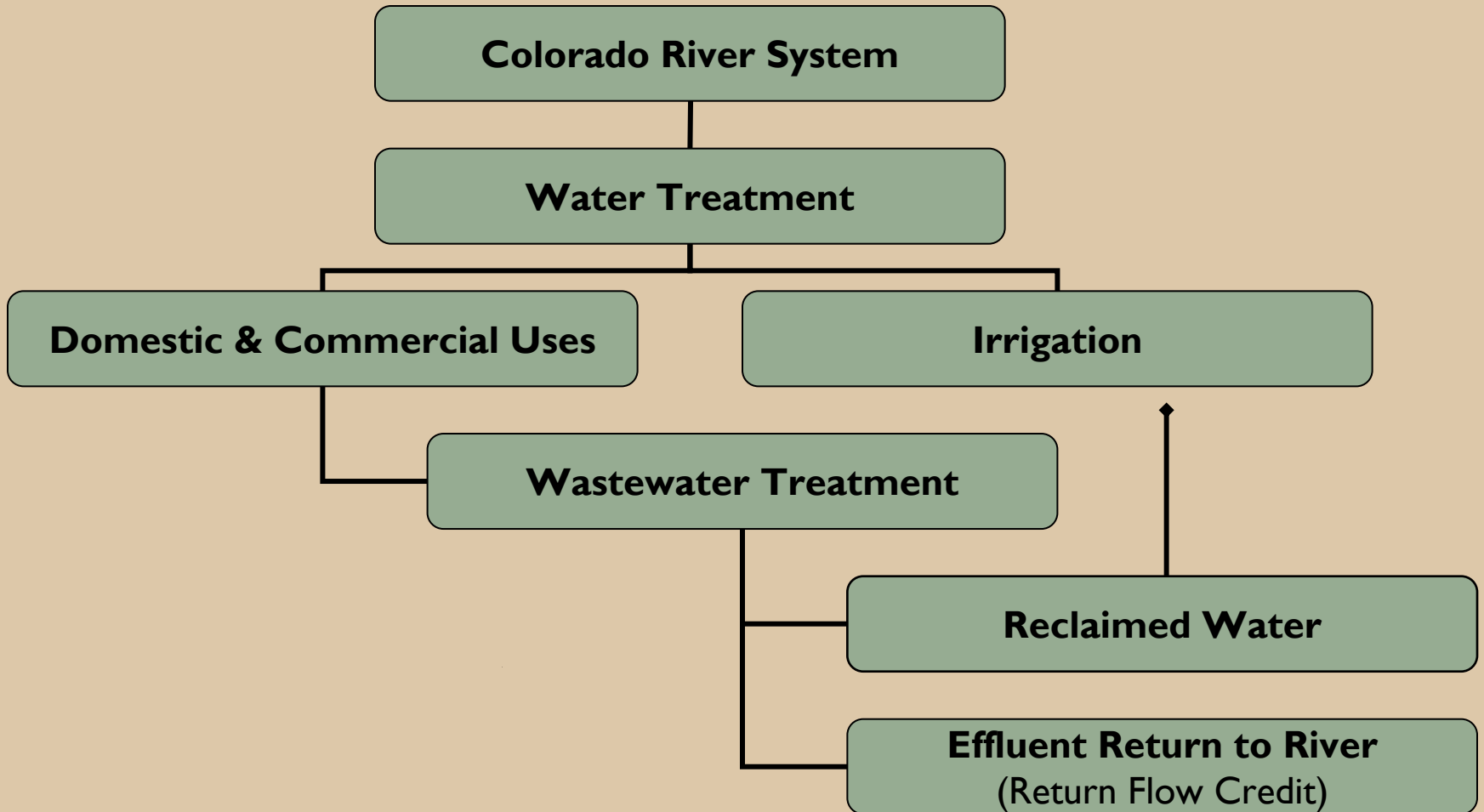
Supplied by snowpack from Colorado Rocky Mountains

- Lake Mead Volume – Full 24.7 MAF
- Currently 46% Capacity (Elev. 1,104) 11.9 MAF
- Evaporation per year .9 MAF
- Nevada's Allocation (set in 1922) .3 MAF
- With return flow credits, Southern Nevada uses (on average) .5 MAF
- Expected inflow Lower Colorado River 12.73 MAF (104%)

(MAF = Million Acre Feet)



Water Resources Cycle





Reclaimed Water History and Uses

- In practice since 1920's
- First use: crop irrigation
- 1956-57 Kansas used reclaimed for drinking water with no adverse effects reported
- Some Utilities such as Orange County, Ca. currently recharge groundwater aquifers after advanced Reclaimed Water Treatment
- No evidence of illness due to exposure during irrigation of crops and landscape in case studies for Reclaimed Water Use



Reclaimed vs. Potable Water Quality

	Reclaimed	Potable
Fecal Coli form	<1 mpn/100ml	<1 mpn/100ml
TDS	1288 mg/l	667 mg/l
pH	7.0 su	7.7 su
Nitrate	5.66 mg/l	0.6 mg/l
Nitrite	<0.05 mg/l	1 mg/l
Ortho Phos	0.10 mg/l	.05 mg/l
CL2 (at treatment)	2.0-3.0 mg/l	1.0-1.5 mg/l

Henderson & Southern Nevada Reclaimed Water Uses



- Dust Control
- Construction
- Landscape Irrigation
- Golf Course Irrigation
- Wildlife Habitat BVP
- Electric Power Plant Cooling Towers



Henderson Reclaimed Flow Rates

Maximum Flow Rates

1985	1.0 MGD
1998	13.38 MGD
2007	18.62 MGD



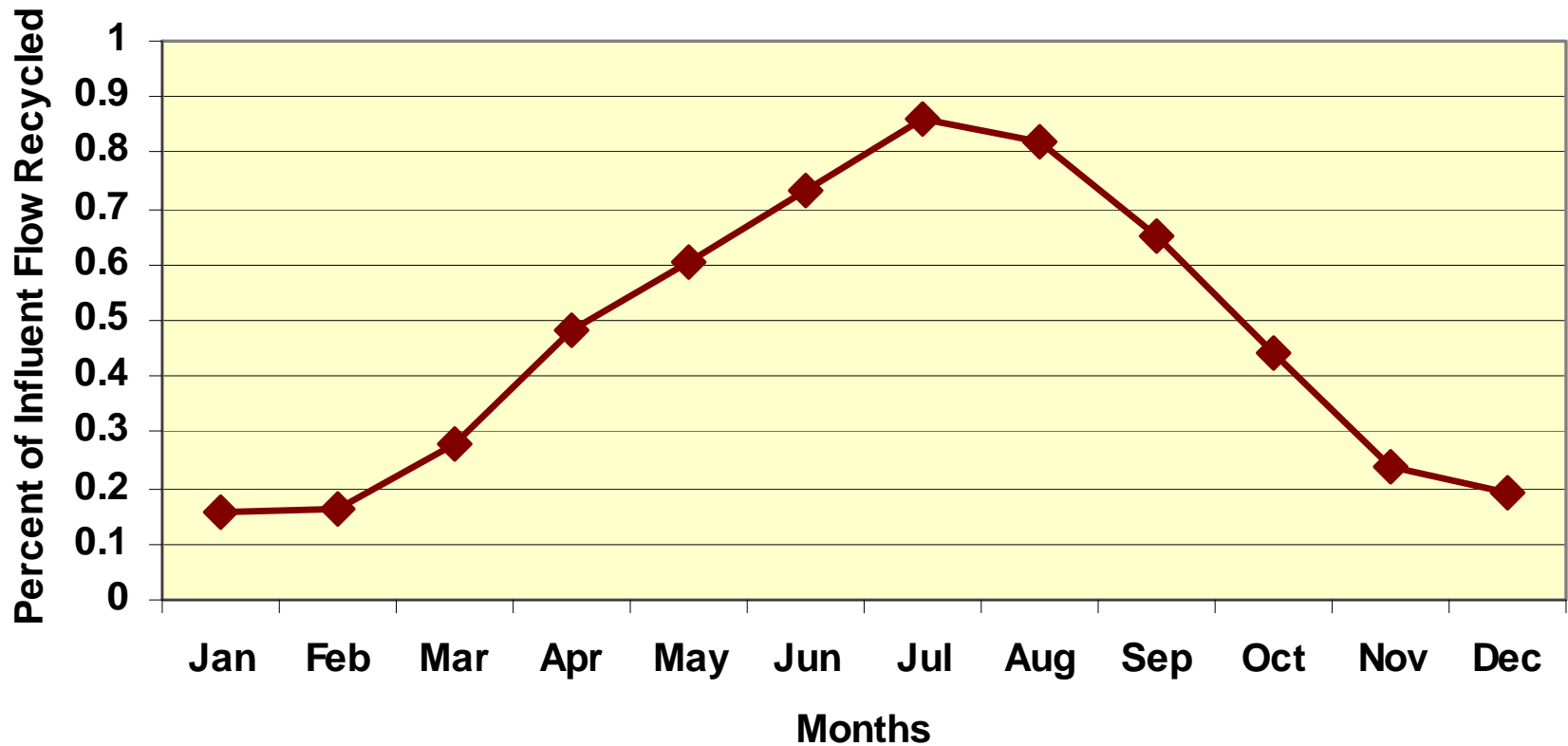
Henderson Reclaimed Totals

2007 Reclaimed Distribution

- Daily Average 7.44 MG
- Monthly Average 226.26 MG
- Year End Total 2.715 BG

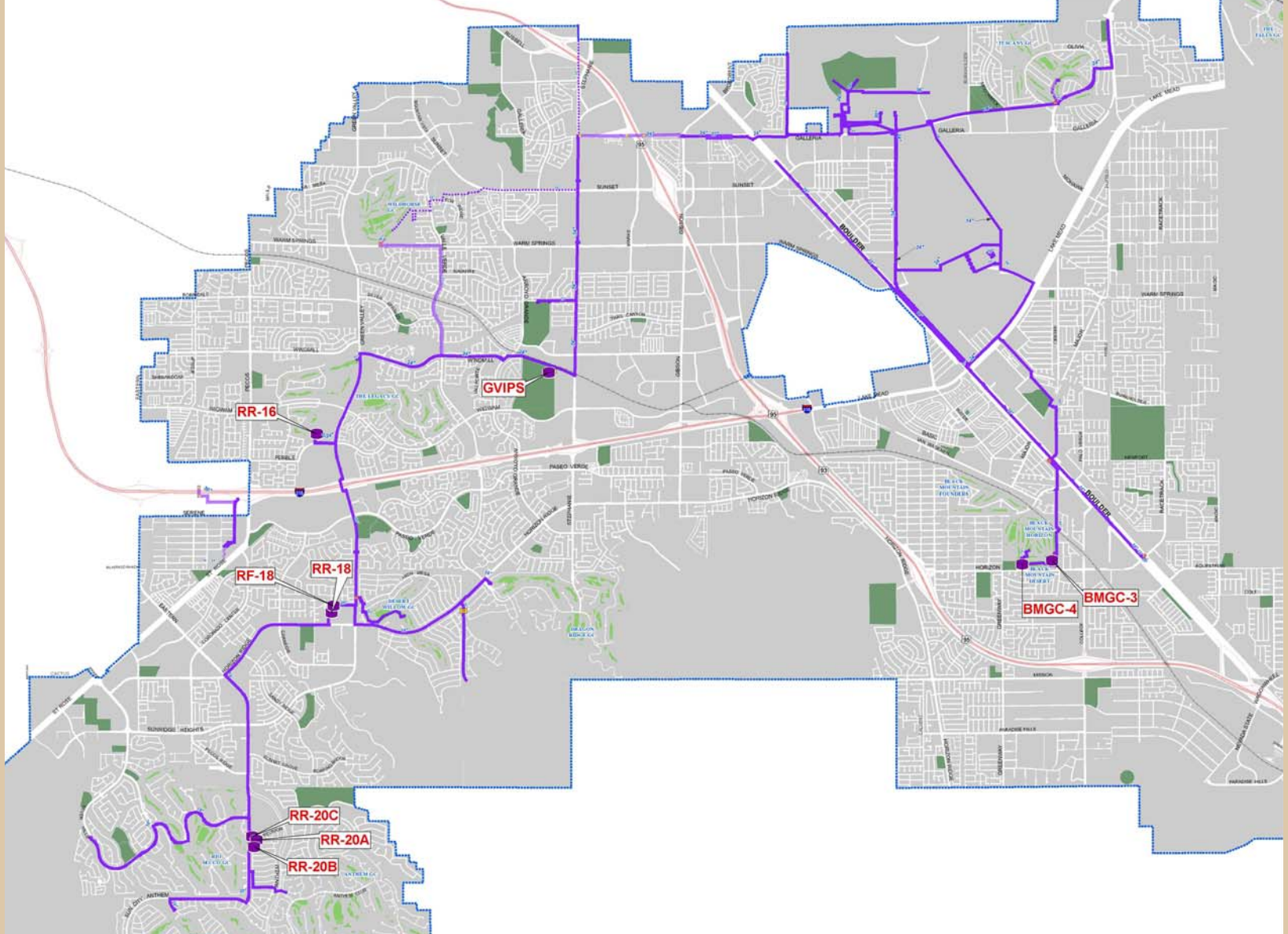


Percentage of Influent Water To Reclaimed by Month





Reclaimed System Map





Water Reclamation Facility Final Pump Station





Reclaimed Water Delivery Capacity

Green Valley PS	14.5 MGD
Black Mountain PS	<u>5.5 MGD</u>
Total Existing Capacity	20.0 MGD

SWRF Phase I (2011)	<u>8.0 MGD</u>
Total with SWRF Capacity	28.0 MGD

(SWRF) Southwest Water Reclamation Facility



Green Valley Transmission System



- 5 Pumping Stations
 - Elevation 1607 to 2740
- 67, 000 Linear Feet of Pipeline
- 13 Miles
 - 18” to 27” Diameter Pipeline



Green Valley Reclaimed Reservoirs



- 6 Storage Reservoirs
 - 7.8 Mg
- 8 Reclaimed Water Customers
- 1 Construction Customer



Green Valley Reclaimed Water Customers



- Anthem Country Club Golf Course
- Wild Horse Golf Course
- Desert Willow Golf Course
- Legacy Golf Course



Green Valley Reclaimed Water Customers



- Dragon Ridge Country Club Golf Course
- Lexington and Concord at Revere Golf Courses
- Rio Secco Golf Club



Green Valley Reclaimed Water Customers



- Crystal Ridge Construction



Black Mountain Transmission System

- 1 Pumping Station
 - Elevation | 607 to 2169
- 52,500 Linear Feet Pipeline
- 10 miles
 - 8" To 24" Diameter
- 2 Storage Reservoirs at Black Mountain Golf Course
 - 3.3 Mg Capacity
- 4 Reclaimed Water Customers



Black Mountain Reclaimed Water Customers



- Palm Mortuary
- Tuscany Golf Course
- Boulder Highway
Median
- Black Mountain Golf
Course



Golf Course Turf Reduction Projects

Average reduction is 50 acres per golf course

- Wild Horse Golf Course
- Black Mountain Golf Course





Summary

- Reclaimed water
 - Quality is similar to potable
 - Increases nutrient quality to turf
 - Increases amount of potable water available to deliver to non-irrigation customers, especially in the summer months
 - Decreases treatment costs for irrigation water
 - Decreases pumping costs for potable water
 - Gives a strong message to recycle with a high quality resource



Henderson Reclaimed Distribution

Questions?