Water Reuse in Southern Nevada

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SOUTHERN NEVADA WATER AUTHORITY®

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Terminology

- Water Reuse: Wastewater that has been treated, then used for a beneficial purpose.
  - *Recycled and reclaimed water*
- Direct Reuse: The use of reclaimed water for nonpotable or potable purposes without first discharging to a natural water supply.
- Indirect Reuse: The use of reclaimed water for nonpotable or potable purposes by discharging to a water supply source, such as a fresh surface water or groundwater.

Reasons for Water Reuse?

- Conservation of fresh water supplies
- Reliable local supply
- Protection of the environment
- Economically attractive

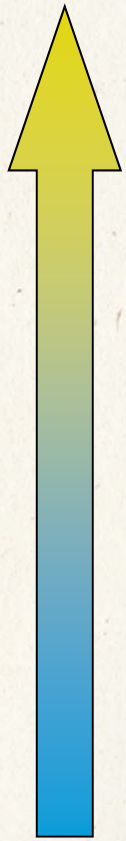
Typical Uses of Reuse Water?

- Agricultural Irrigation
- Landscape Irrigation
- Industrial Uses
- Urban Nonirrigation Uses
- Environmental and Recreational Uses
- Groundwater Recharge
- Indirect Potable Reuse
- Direct Potable Reuse

Water Reuse Types

- Direct Potable Reuse
- Indirect Potable reuse
- Groundwater Recharge
- Agricultural Reuse on Food Crops
- Recreational Reuse
- Urban Irrigation Reuse
- Industrial Reuse
- Environmental Reuse
- Agricultural Reuse on Non-food Crops

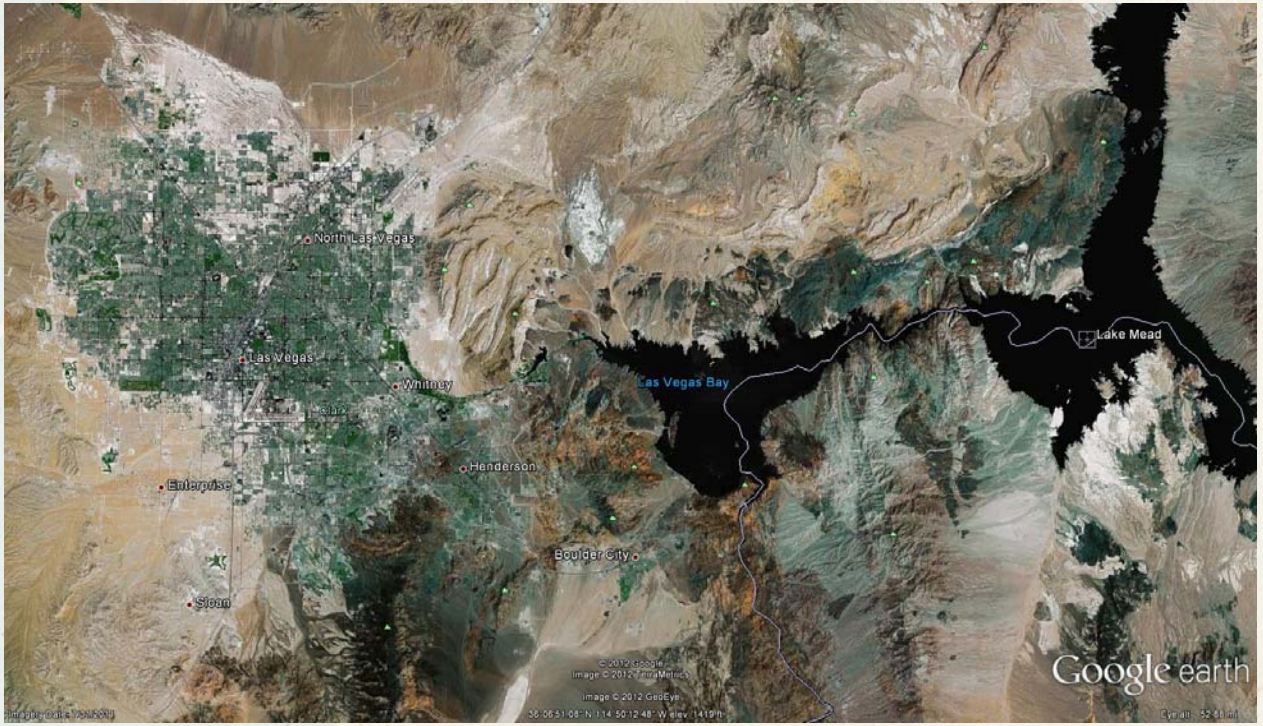
More Stringent Regulations
More Advanced Treatment
Higher Cost



Less Stringent Regulations
Less Treatment
Lower Cost

Water Reuse in Southern Nevada

- Water reuse plays a critical role in extending our community's water supply
- Practicing water reuse for over 50 years



Water Reuse in Southern Nevada

- Direct reuse is a process by which wastewater flows are treated to stringent quality standards, then used for *nonpotable* purposes such as irrigation.

- Indirect reuse is achieved by treating wastewater to very high levels, then returning that water to Lake Mead.

  - ***Return Flow Credit:***
    - For each gallon of water returned, a credit of one gallon is created.
    - We are able to stretch our water resources by billions of gallons each year.

Water Reuse in Southern Nevada

Guiding Principles:

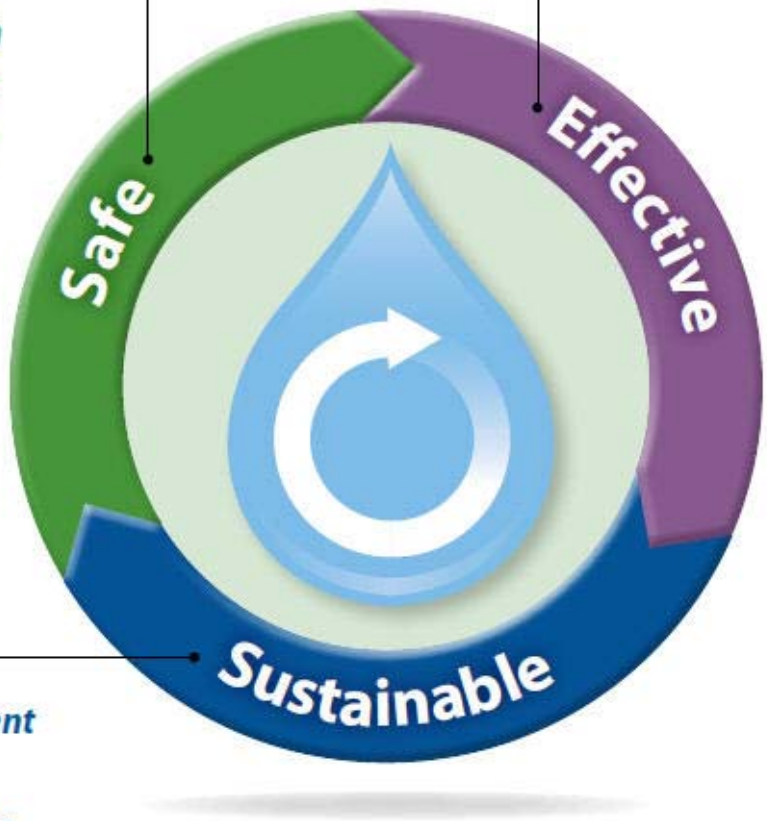
Recycled Water resources should be developed and used in applications that are:

Safe

Treated to provide a high degree of assurance that public health and safety is safeguarded.

Effective

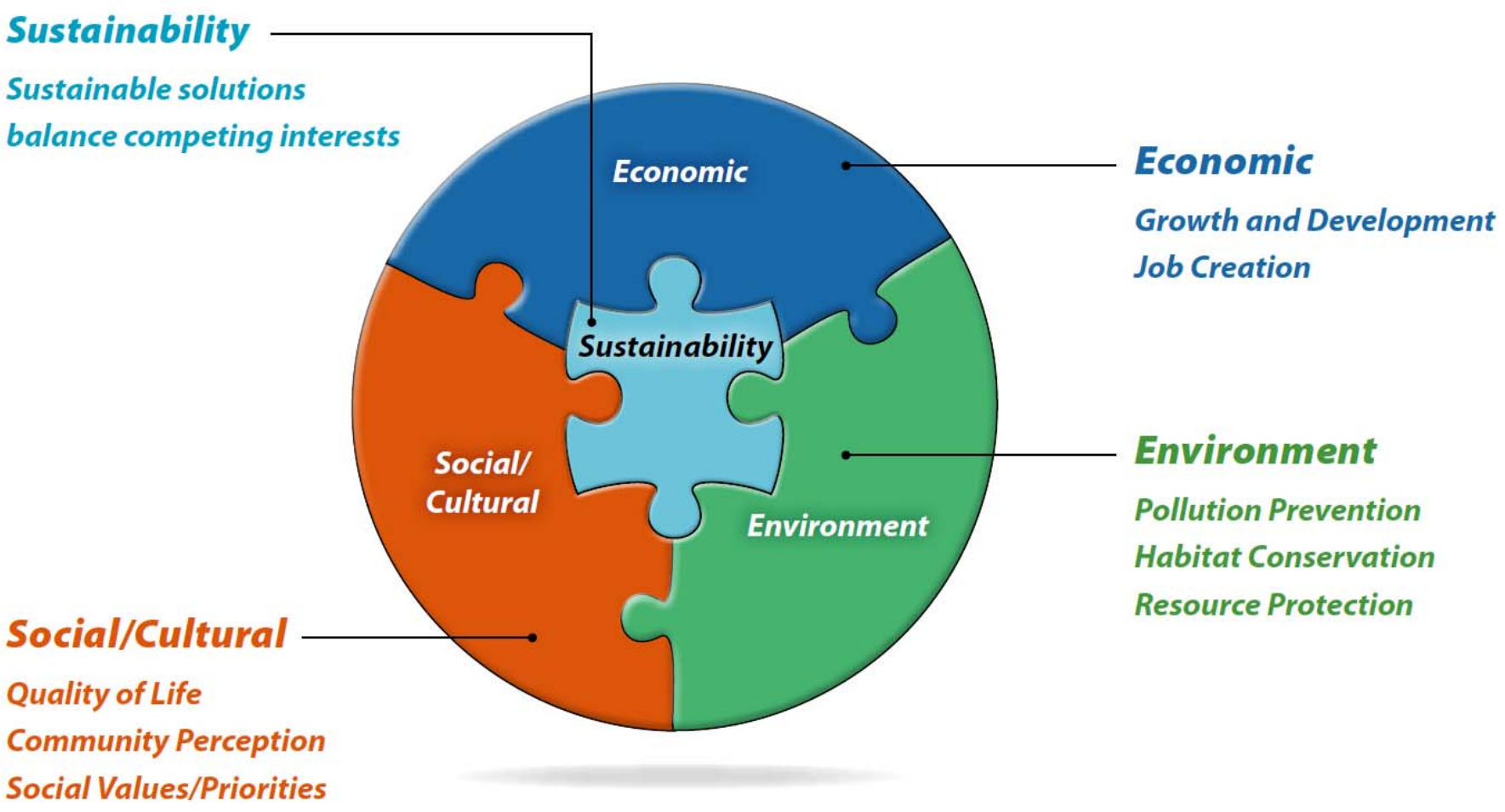
Shown to be an effective means of maximizing the water resources available to Southern Nevada.



Sustainable

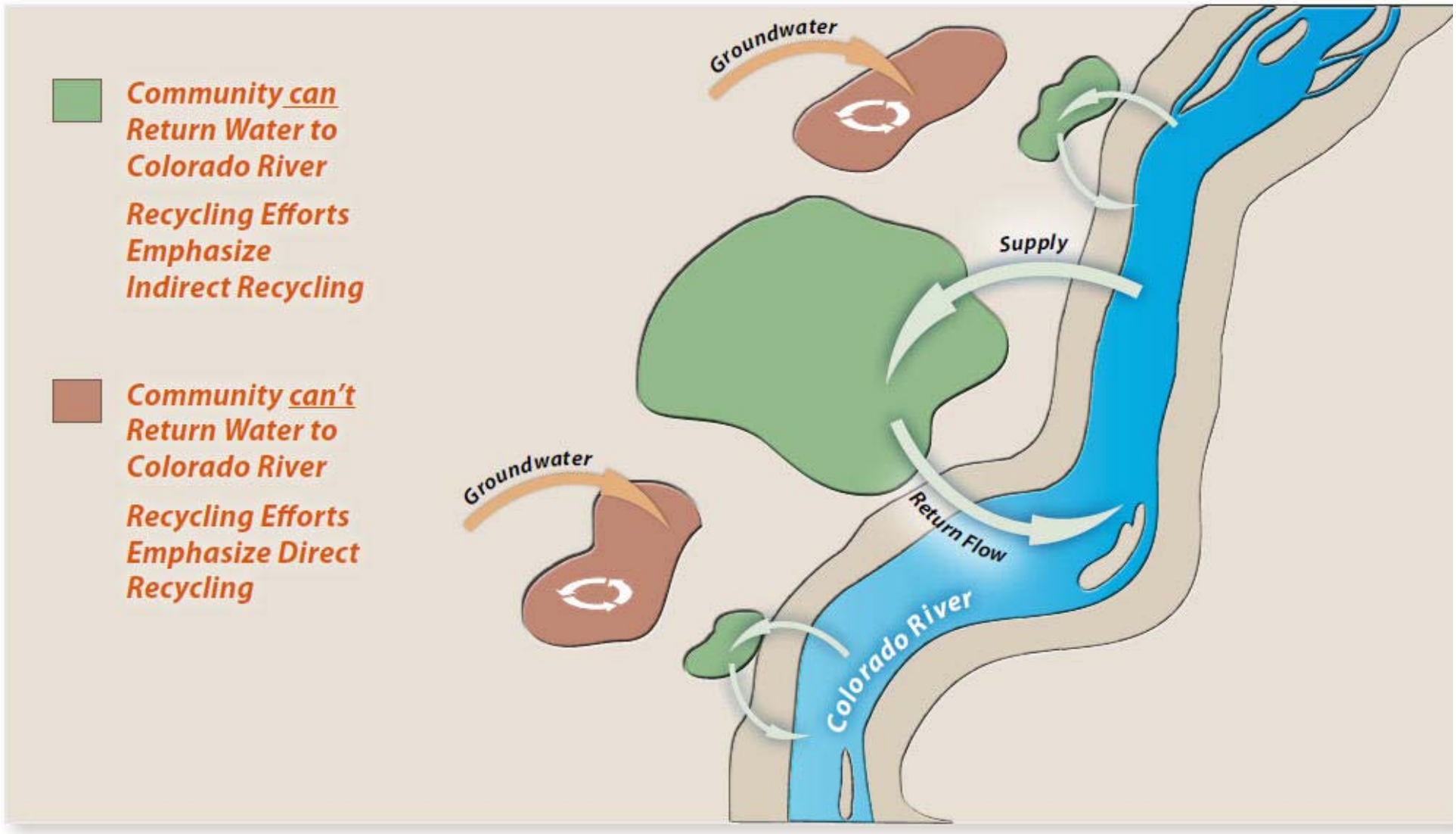
Demonstrated to represent the best balance of the environmental, economic, and social/cultural benefits.

Sustainability

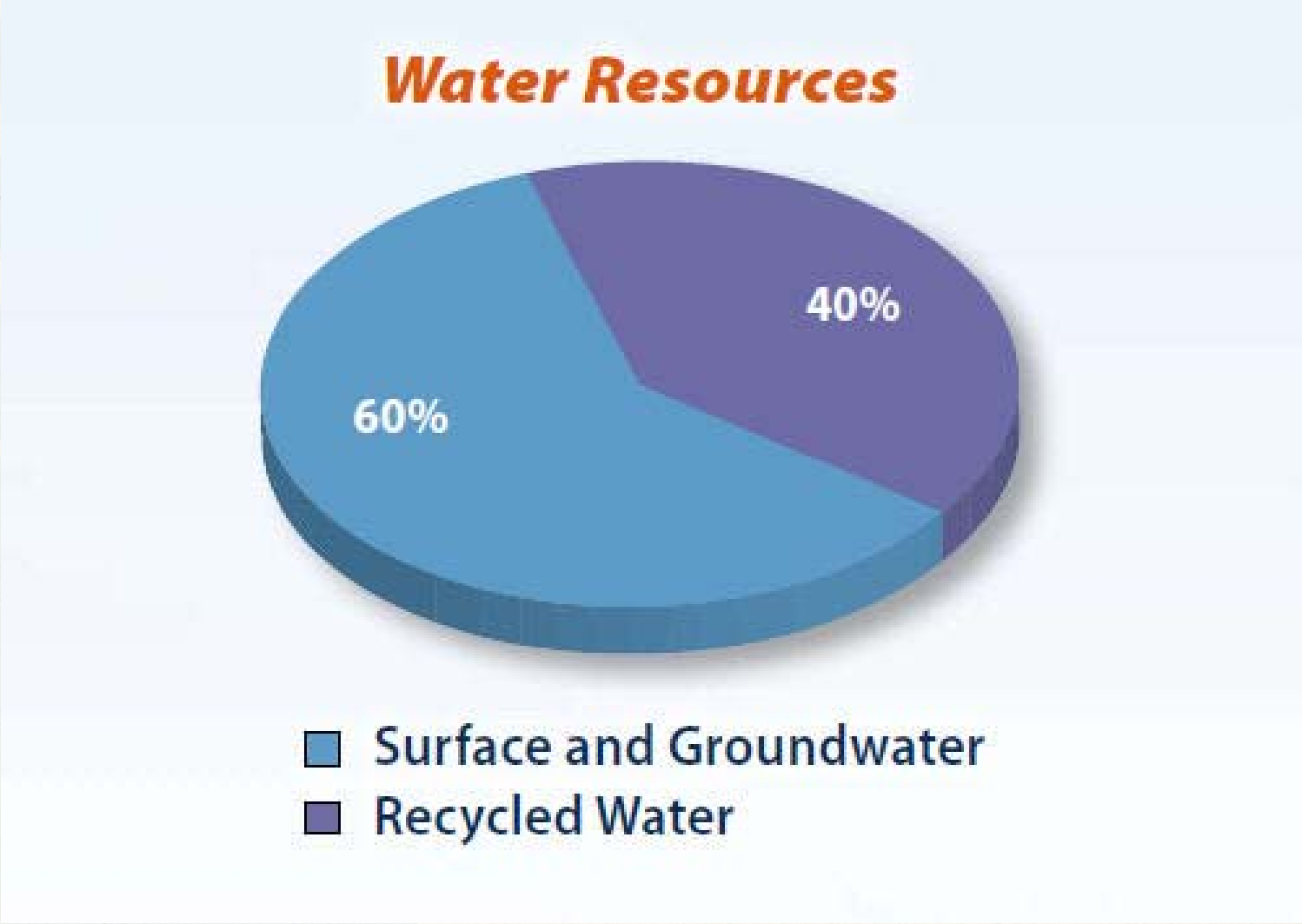


Water Reuse in Southern Nevada

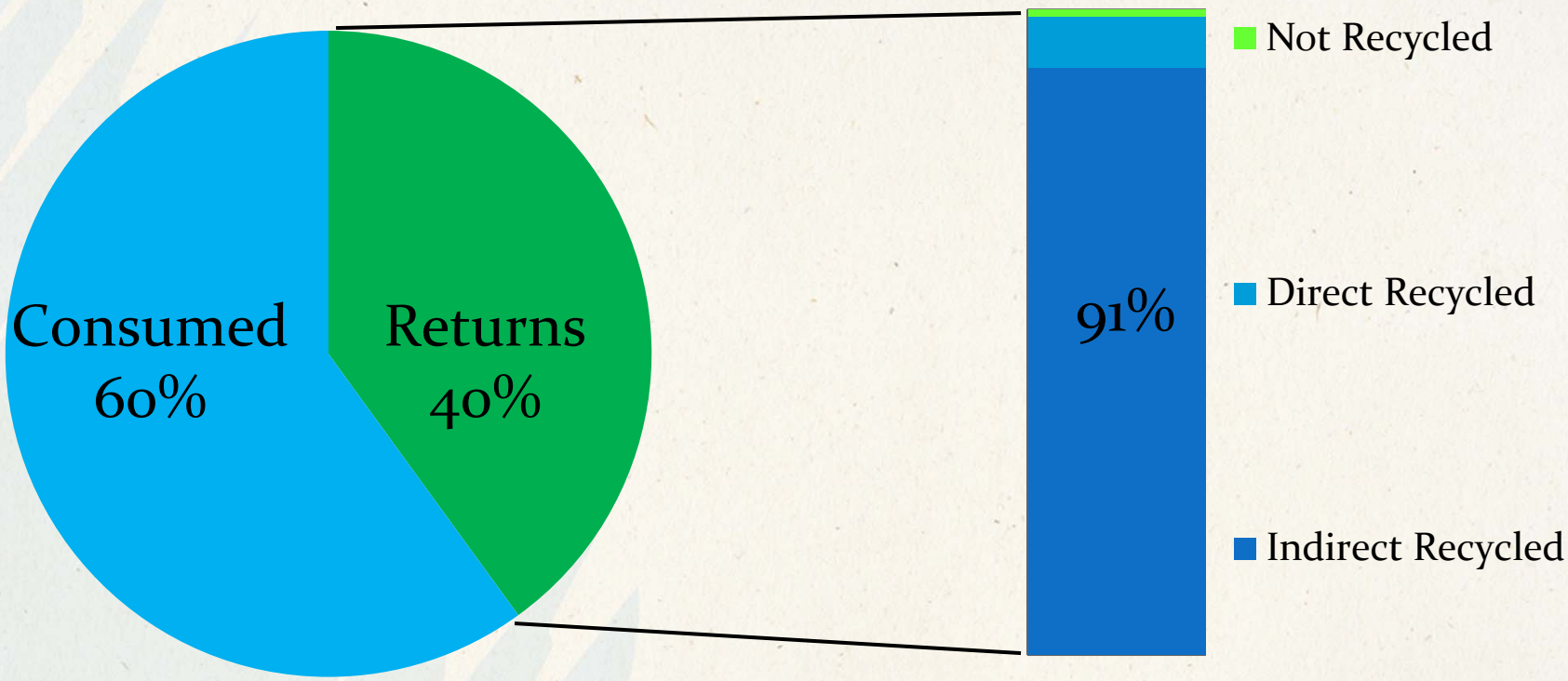
Southern Nevada's Constraints and Challenges Vary with the Region



Water Reuse in Southern Nevada



Water Reuse in Southern Nevada



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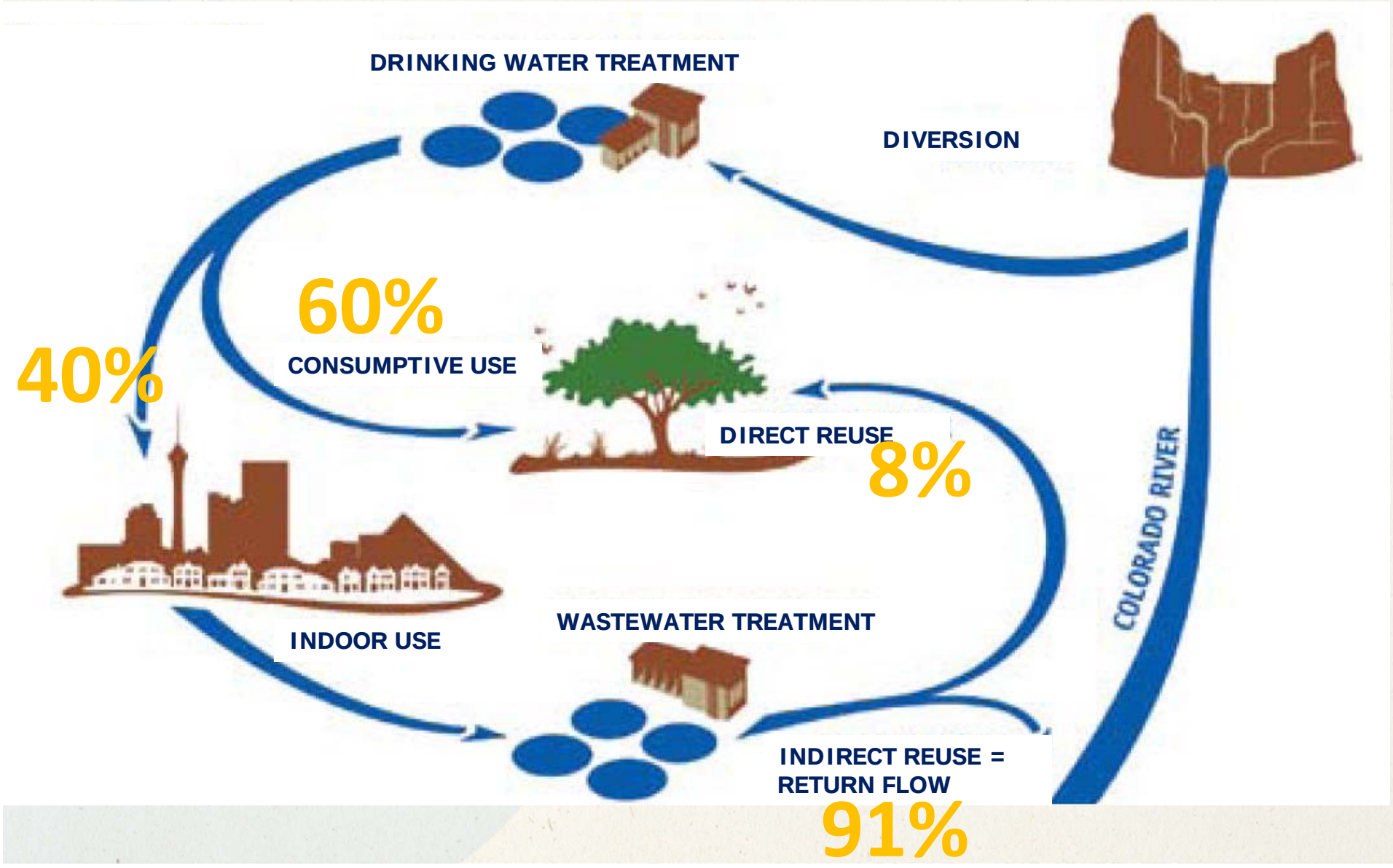


Water Reuse Menu

Beneficial Uses:

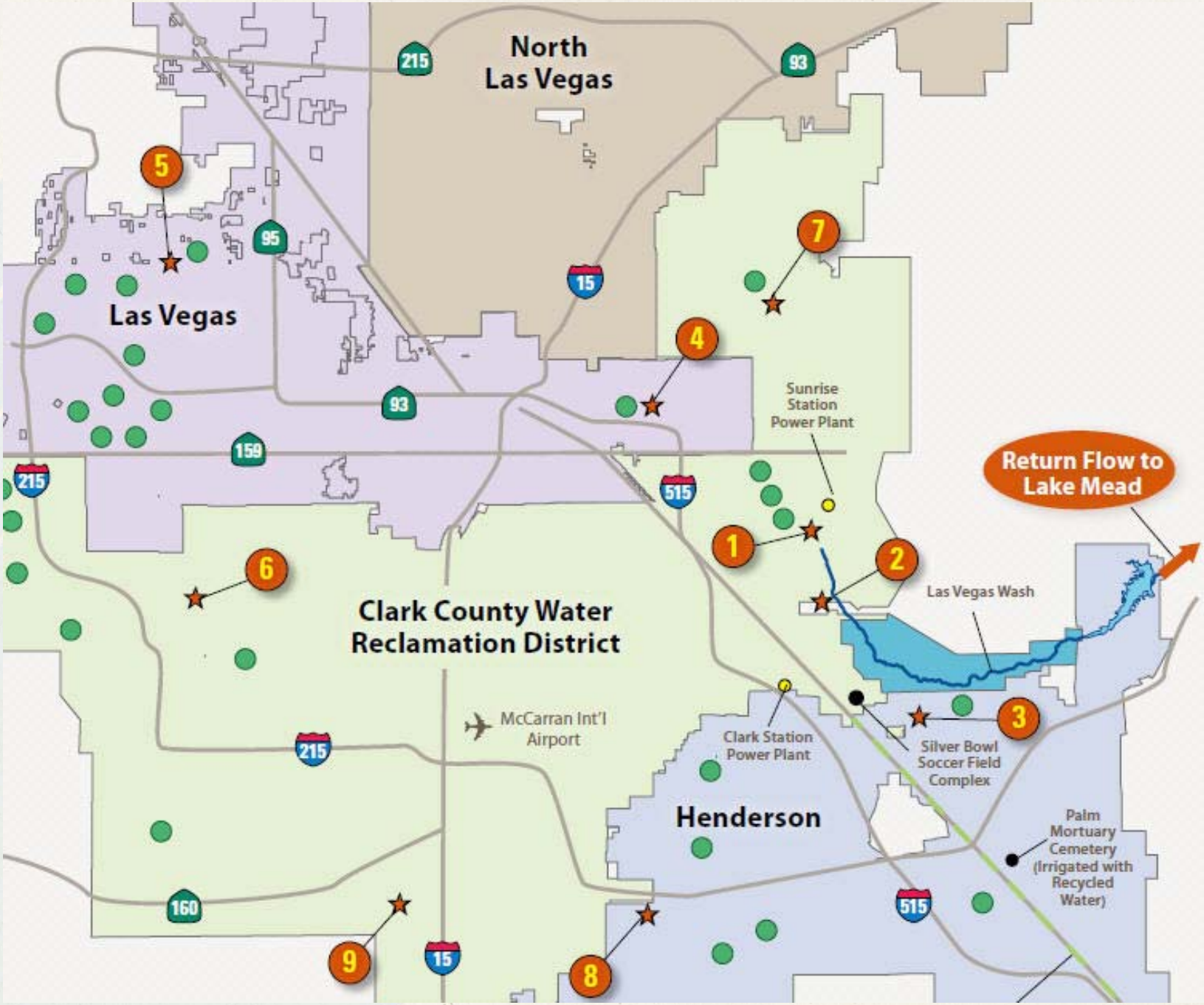
- Indirect Reuse as Return Flow
- Public/Commercial Landscape Irrigation
- Golf Course Irrigation
- School Yard Irrigation
- Park Irrigation
- Industrial Uses
- Recreation
- Aquatic life
- Aquifer Storage and Recovery

Direct Costs for Direct Water Reuse

- Additional treatment
  - capital, operational, maintenance
- Conveyance/distribution
- Storage
- Monitoring and surveillance

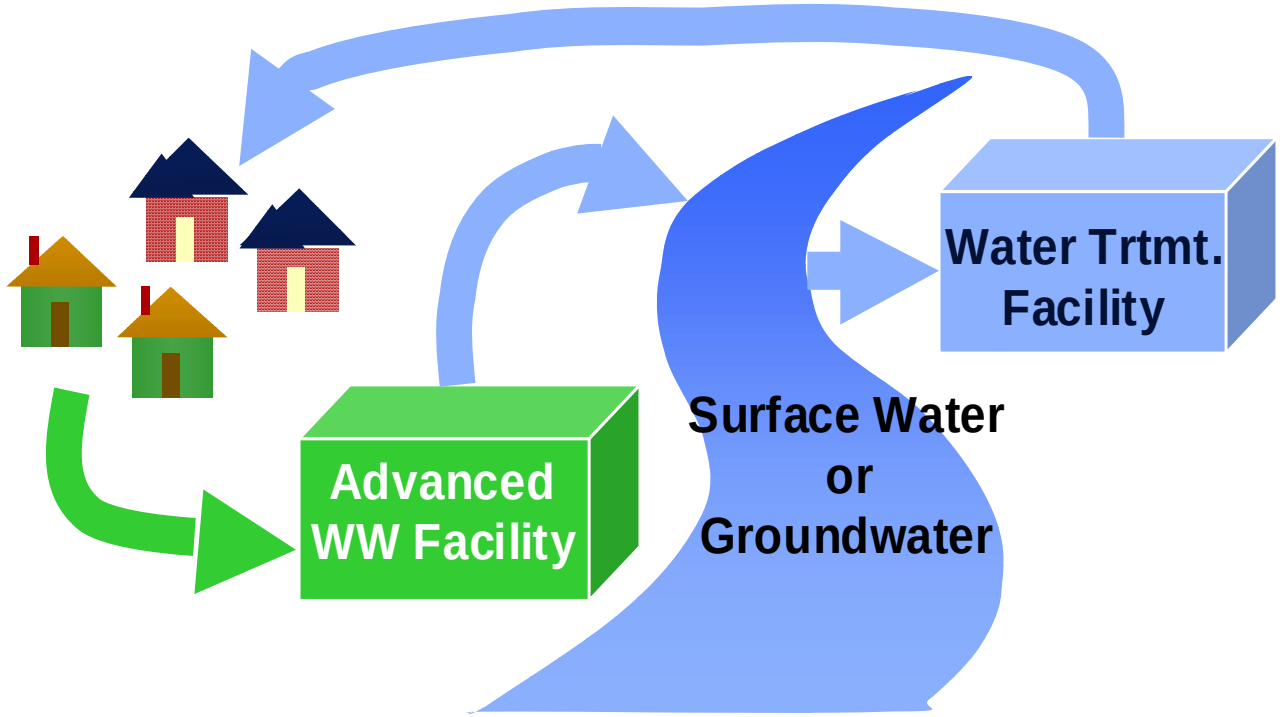
Net Benefits to Direct Reuse

- Reduce energy for water treatment and delivery
- Reduce demand for new water infrastructure
- Reduction in nutrients added to the Colorado River


North
Las Vegas
Las Vegas
Sunrise
Station
Power Plant
Return Flow to
Lake Mead
Las Vegas Wash
Clark County Water
Reclamation District
McCarran Int'l
Airport
Clark Station
Power Plant
Silver Bowl
Soccer Field
Complex
Henderson
Palm
Mortuary
Cemetery
(Irrigated with
Recycled
Water)
215
93
95
15
159
515
160
1
2
3
4
5
6
7
8
9

Indirect Potable Reuse

- Recycled water is used in Southern Nevada to supplement surface water supplies as Indirect Potable Reuse



Indirect Potable Reuse

Indirect Potable Reuse

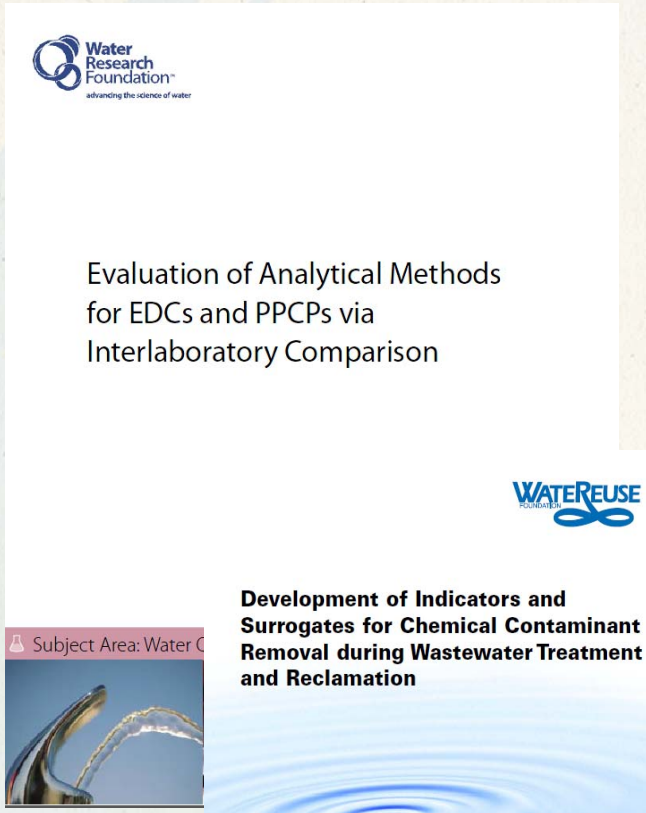
Key Components of IPR:

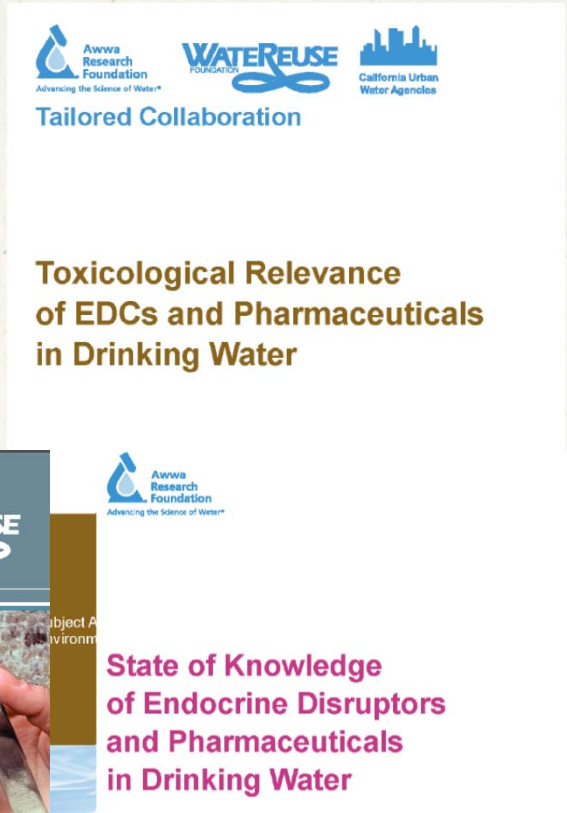
- Sewage collection system
- Conventional/advanced wastewater treatment
- Integration of an environmental buffer
- Drinking water treatment
- Overarching monitoring of water quality and system performance

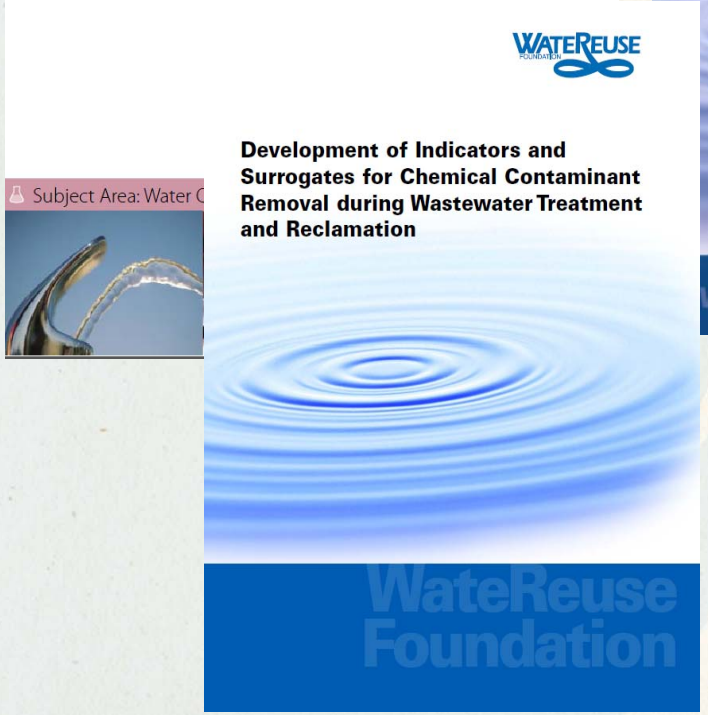
Water Quality

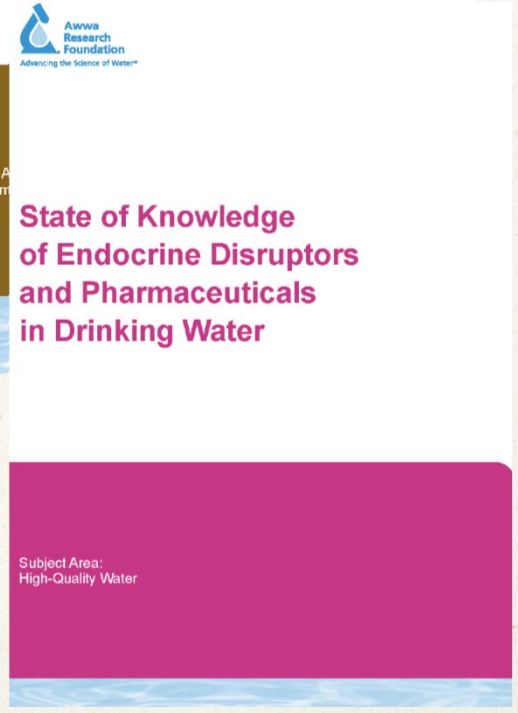
- Meet requirements for beneficial uses
  - Clean Water Act, NJDEP
- Meet drinking water standards
  - Safe Drinking Water Act
- Aggressive programs to protect water quality and supply
  - Continuous monitoring and testing to ensure public safety
  - Advanced research on the health and safety implications of reuse water

Water Quality









Water Quality

Our Level of Wastewater Treatment

Cities	Cities	Cities	Cities
Miami, FL	Denver, CO	Los Angeles, CA	Las Vegas, NV
San Francisco, CA	New York City, NY	Phoenix, AZ	Scottsdale, AZ
Philadelphia, PA	Houston, TX	Atlanta, GA	Placerville, CA
Portland, OR	Chicago, IL	Dallas, TX	El Paso, TX

- Primary
- Secondary
- Advanced Secondary
- Tertiary
- Advanced Tertiary*

* Advanced Tertiary treatment includes at least four of the following: nitrification, denitrification, BNR, filters, and chemical treatment

Summary

- Water reuse plays a critical role in extending our community's water supply.
- Guiding principles: water reuse resources need to be developed and used in applications that are *safe*, *effective* and *sustainable*.
- Water reuse represents a sustainable solution that balances *environmental protection*, *economic* and *social considerations*.
- Need to continue to promote new water reuse uses.
- Need to continue proactive research on the health and safety implications of reuse water