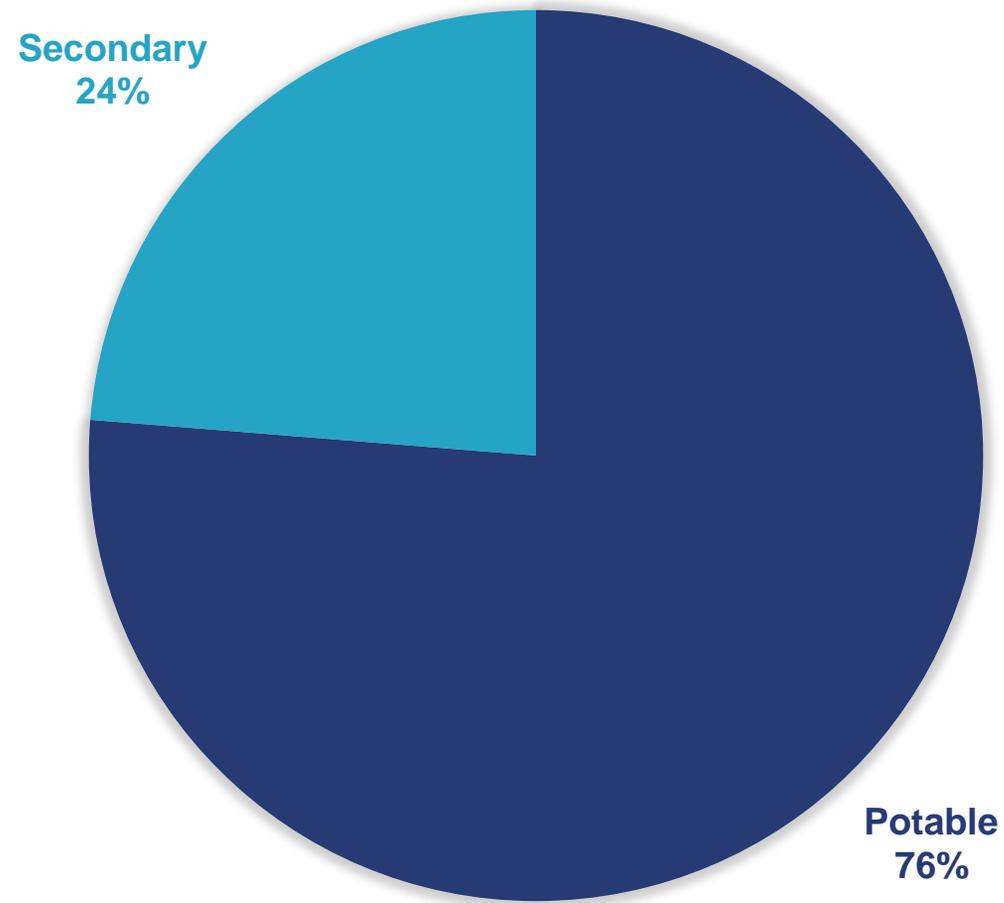




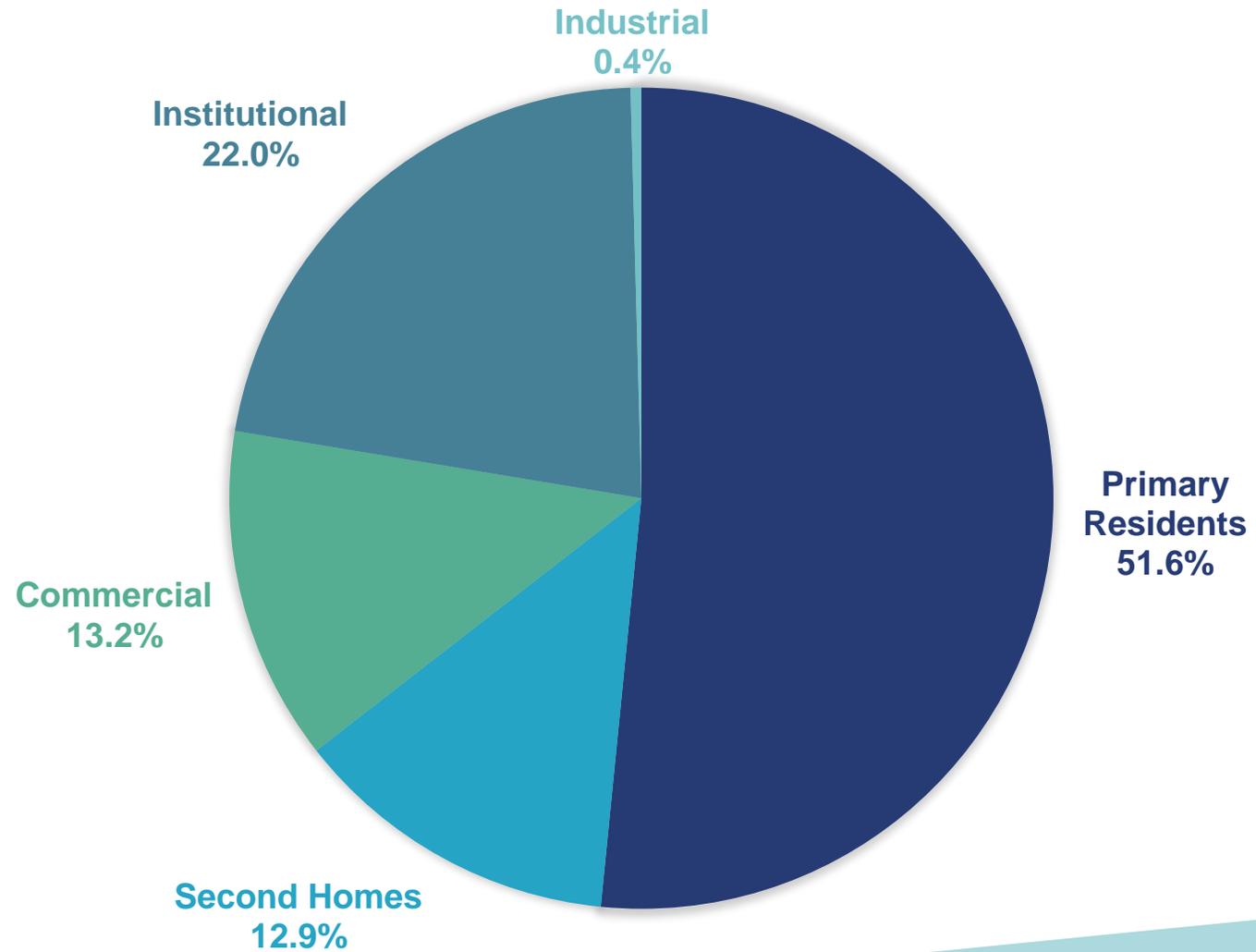
WASHINGTON COUNTY WATER USE

Executive Water Finance Board | September 17, 2018

Water Use by Type



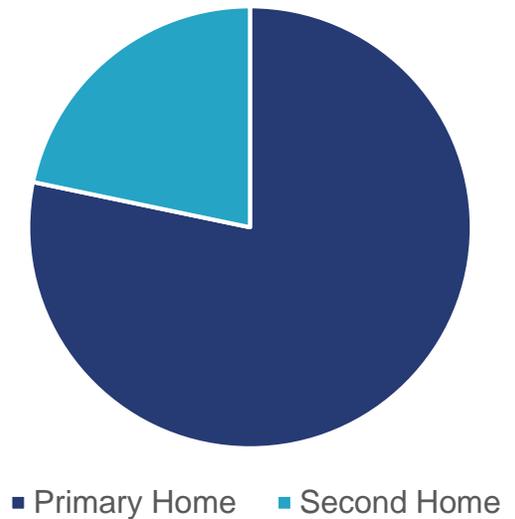
Water Use by Category



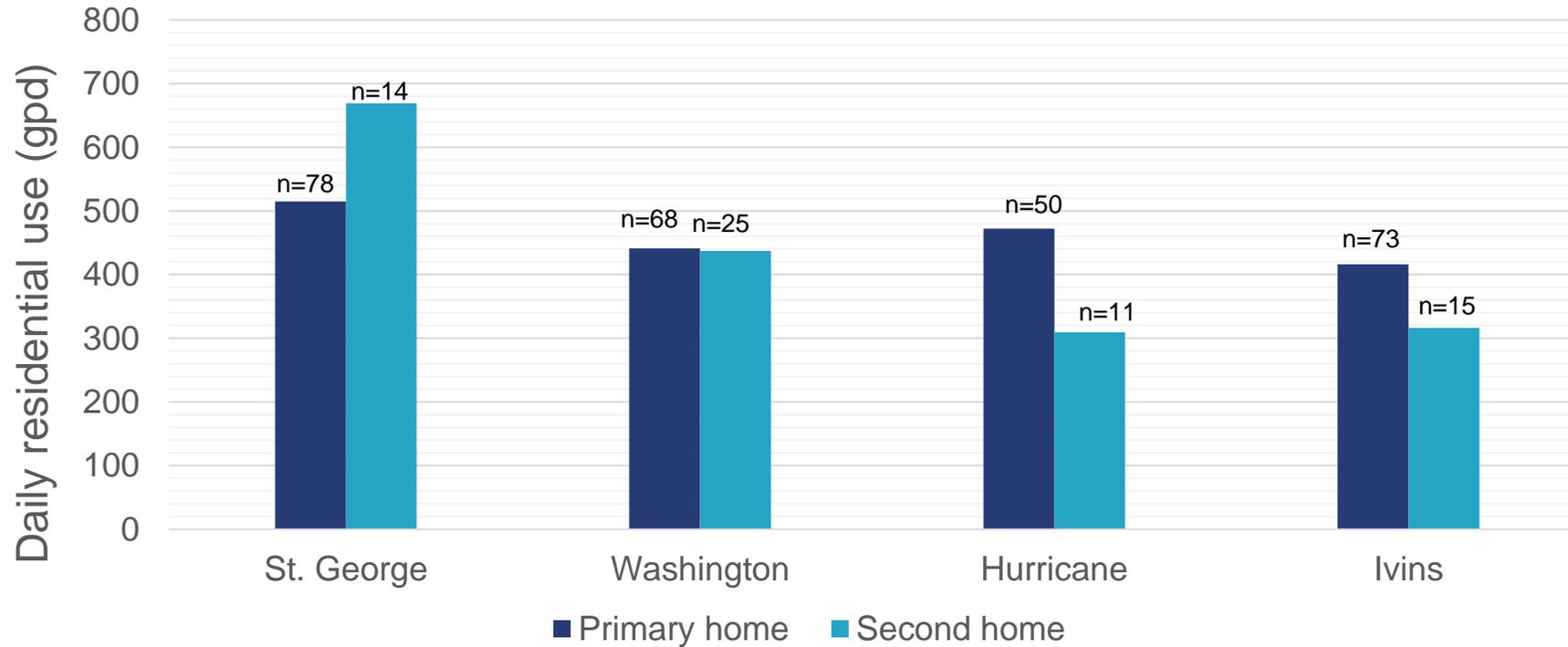
Households

Approximately 20% percent of homes in Washington County are second homes.

City	Population (2016)	Persons per Household (2012-2016)	% Second Homes (2017)
St. George	82,318	2.88	21%
Washington	25,339	2.90	21%
Hurricane	16,159	3.02	16%
Ivins	8,132	2.76	19%

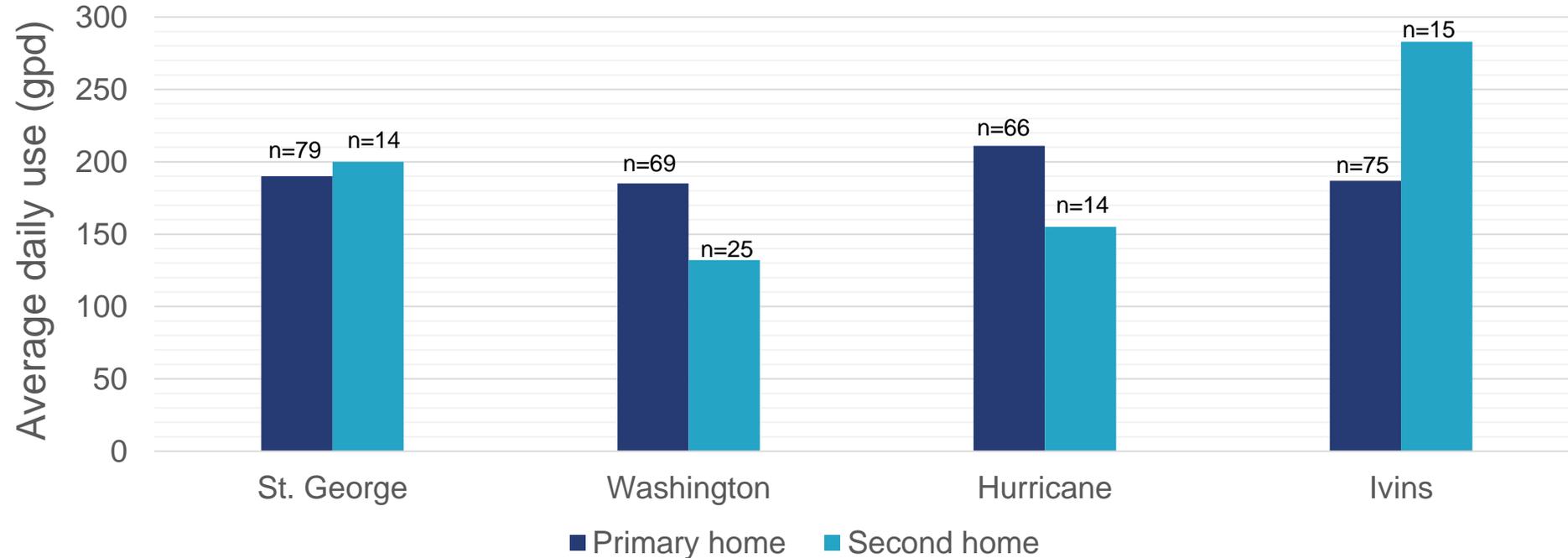


Second Home Water Use (indoor & outdoor)



Homes randomly selected from Washington County Assessor data. Average daily use calculated from June 2015 to May 2017 monthly billing data provided by cities. Homes supplied secondary irrigation water are excluded.

Second Home Water Use (indoor)

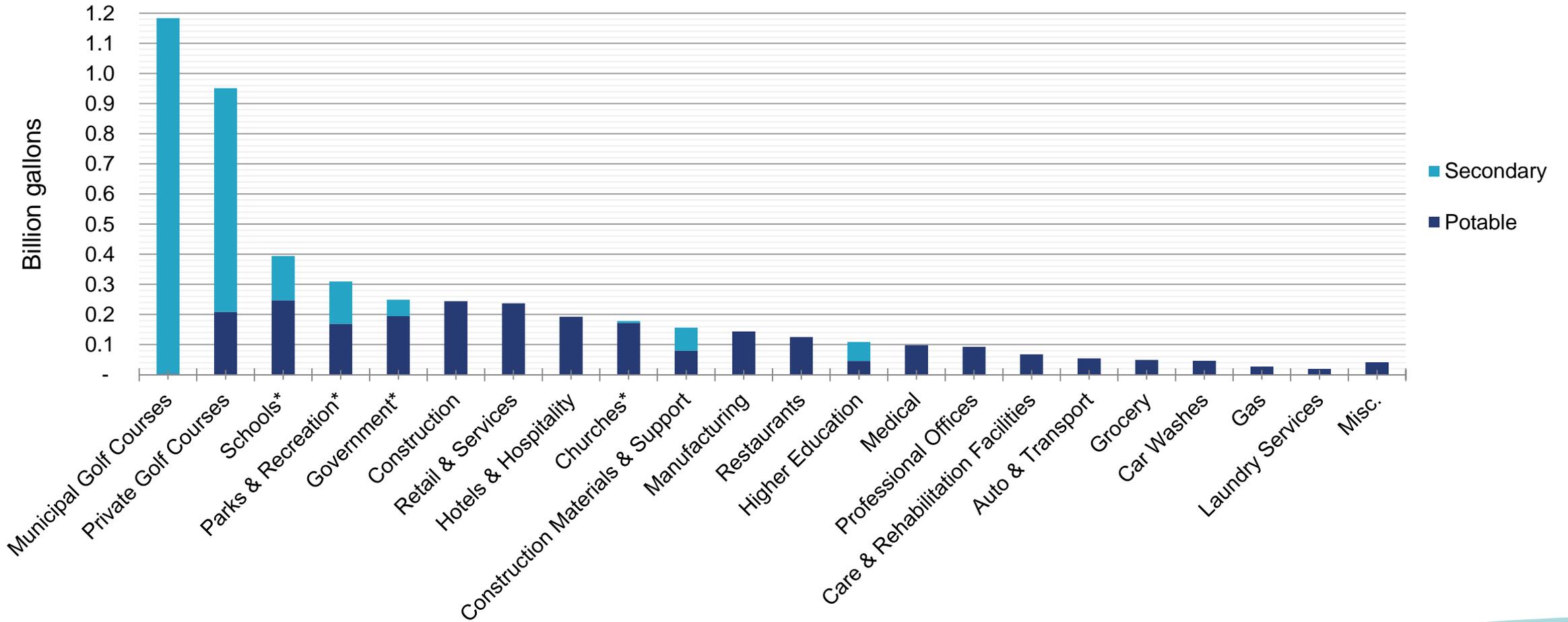


Homes randomly selected from Washington County Assessor data. Average daily use calculated from June 2015 to May 2017 monthly billing data provided by cities. Homes supplied secondary irrigation water are excluded.

Commercial, Institutional and Industrial Water Use

- Commercial, institutional and industrial (CII) 2017 water use data is from the cities of St. George, Washington and Hurricane
- Data represents more than 90 percent of CII use in Washington County
- Includes all potable and most secondary water use
- Preliminary analysis

Preliminary CII Water Use by Industry



*Industry category does not include the total secondary irrigation use. Some of the total secondary irrigation water is only master metered.

Golf Course Water Use

- Conservation efforts
 - 11 of the 12 courses use secondary (irrigation, reused wastewater or brackish) water
 - Testing water-efficient turf varieties specifically for golf-course use
- More than 300,000 annual visitors*
- More than \$55 million estimated direct economic impact*



Images by St George Utah Golf

*St. George Area Convention & Tourism Office

Educational Facilities Water Use

- Conservation efforts
 - Water-efficient landscapes including artificial turf fields
 - Use of irrigation water for landscapes
 - Landscape auditor
 - High efficiency fixtures
- Approximately 50 K-12 schools
 - 20% of the county's population is school aged (5-17 years)
- Three institutions of higher education
 - More than 10,000 students



Images by Bud Mahas Construction

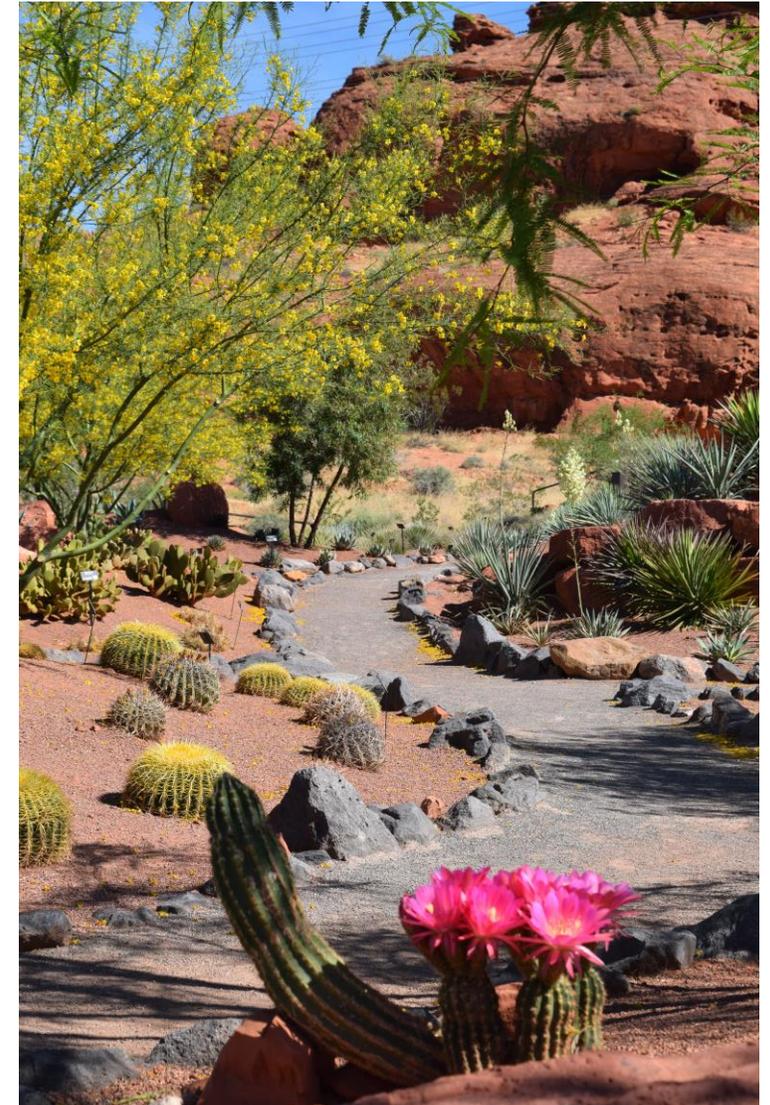
Construction-Related Water Use

- St. George is the fastest growing metropolitan area in the nation
- Water is used for dust control, compaction, gravel production, cement plants, etc.; secondary water is used when available
- More than 10 percent of our workforce is employed in construction; number of employees increased 11 percent from 2017 to 2018



Parks and Recreational Water Use

- Conservation efforts
 - Use of secondary irrigation
 - Water efficient irrigation systems, including smart controllers
 - Facilities serve as flood control detention basins
- Enhance the recreational amenities and aesthetics of the community
- Popular venues for community and athletic events



Q&A



LOCAL WATER SOURCES

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Water Supply Planning

- Exhaustive evaluation of water supply options
 - Surface water
 - Groundwater
 - Colorado River
- Storage expansion evaluations
- Conservation

Water Supply Planning

- Most supply options eliminated from further consideration*
 - Limited new water appropriations (per Utah State Engineer)
 - Technical infeasibility (geologic and capacity limitations)
 - Water quality issues
 - Wilderness areas or national parks conflicts
 - Excessive environmental impacts

* *State of Utah 1988, 1992, 1993, 2008, 2012, 2016 studies*

Water Supply Planning

- Virgin River Supply Considerations
 - Virgin River closed to new appropriations
 - Water right priorities restrict diversions
 - Limited storage site availability
 - Utahns desire to protect ag uses and rural culture
 - Brackish ag water requires reverse osmosis treatment

Water Supply Planning

- Additional Groundwater Supply
 - Navajo Sandstone aquifer is over-appropriated
 - Escalante Valley groundwater management plan aims to reduce existing withdrawals
 - Pursuit of Snake Valley groundwater is inadvisable due to opposition from water right holders in Utah and Nevada resulting in failure to reach agreement

Water Supply Planning

- Conservation
 - District's comprehensive approach relies heavily on conservation
 - Conservation-only proposals
 - forego critical, second source development
 - create significant water shortage risk
 - exact high socioeconomic costs

LPP Study Report Alternatives

Alternative	Cost	Considerations
LPP	\$1.4 billion infrastructure costs	<ul style="list-style-type: none"> • Provides a critical second supply • Higher reliability than Virgin River • Higher quality water • Preserves agriculture
No Lake Powell Water	\$2.9 billion infrastructure costs significant additional homeowner costs	<ul style="list-style-type: none"> • Does not provide a second supply • Eliminates residential outdoor potable water use • Eliminates most agriculture
No Action	no new infrastructure included	<ul style="list-style-type: none"> • No new water supply investment • Constant water shortages with socioeconomic consequences

Note: Costs are in 2016 dollars (LPP Final License Application, UDWRe 2016)

Q&A



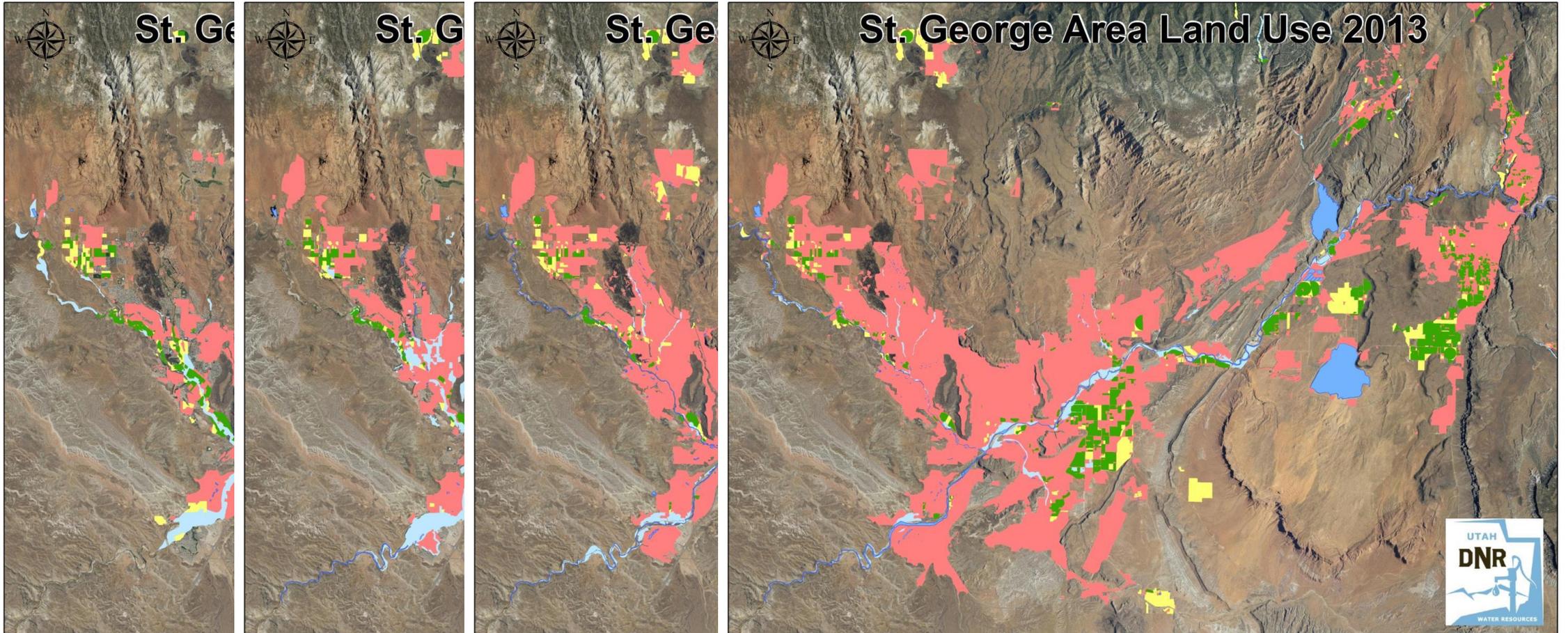
AGRICULTURAL WATER

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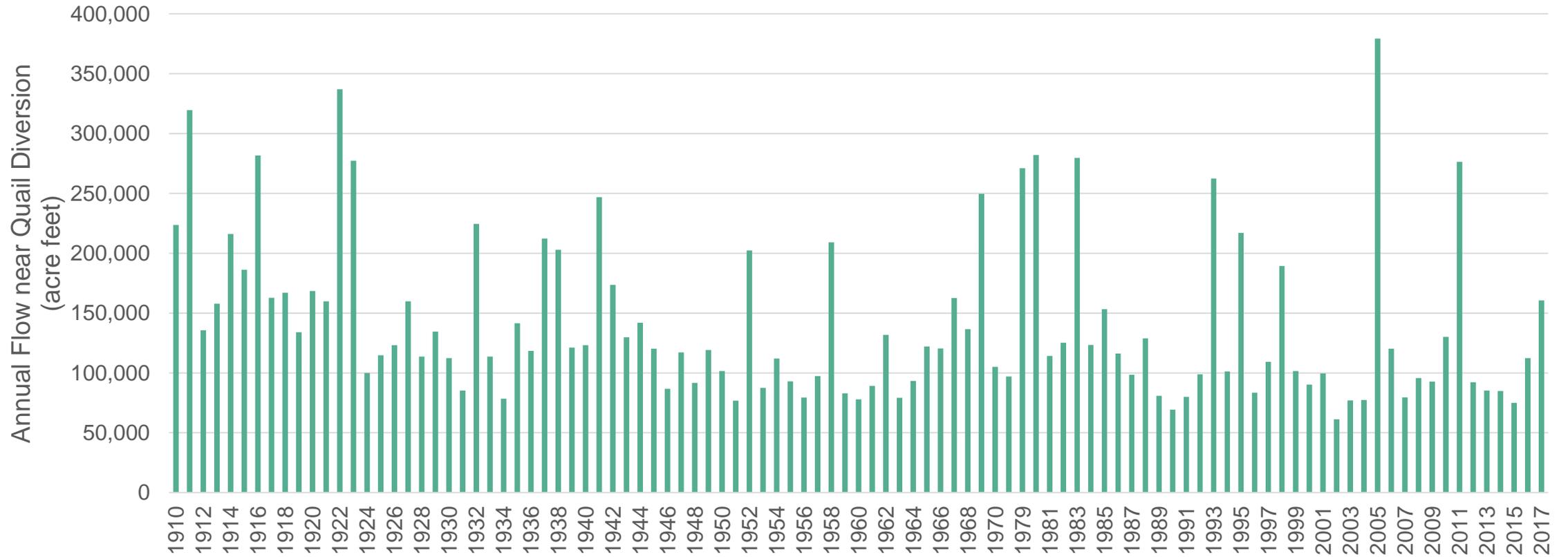
Agricultural Water

- Limitations
 - Availability
 - Reliability
 - Water right priority
 - Quality
 - Collection
 - Cost
- Estimated conversion potential approximately 10,000 acre feet

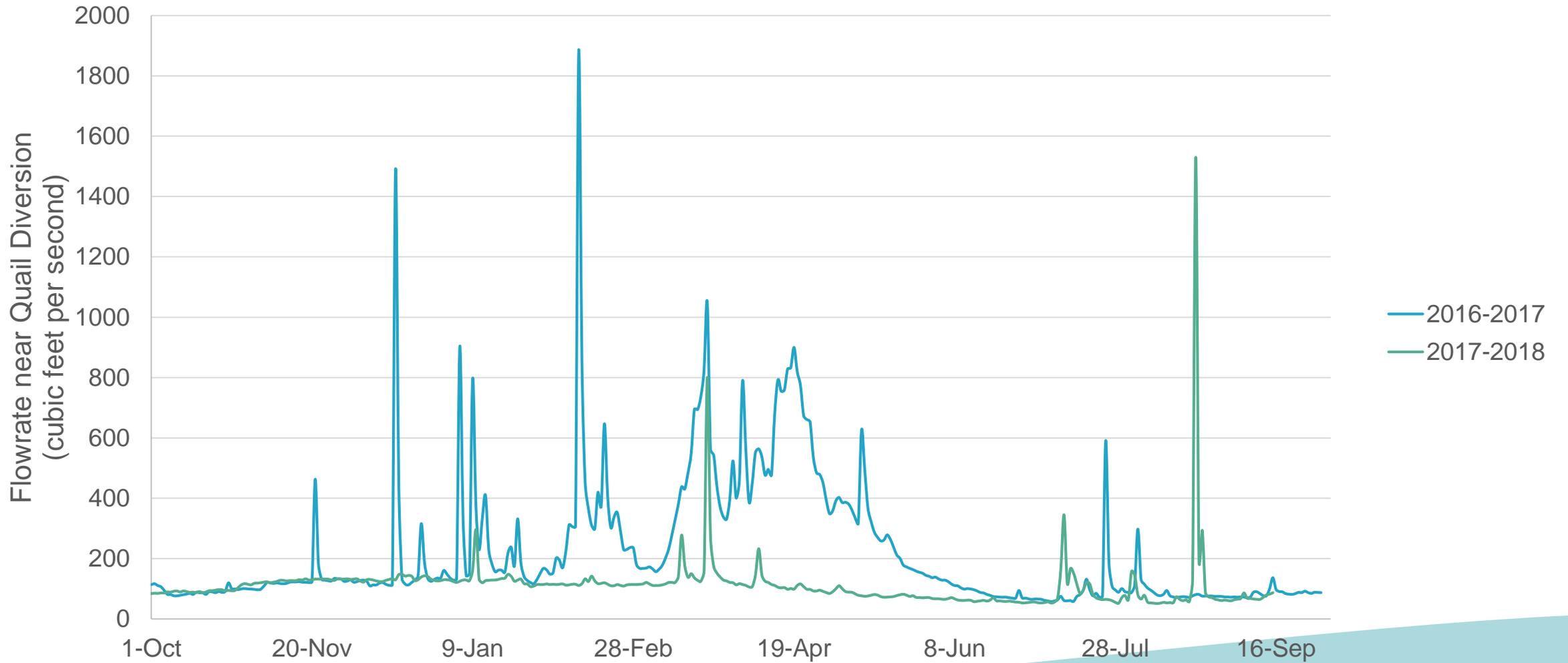
Availability



Reliability



Reliability



Quality

- One of the top three contaminants to the Colorado River is in Washington County
- Hot springs deposit 110,000 tons (4,074 dump truck loads) of salt annually into the system



Collection

- Typical high flow conditions at the Quail Creek Diversion Dam



Cost

- Purchase of water rights
- Treatment
 - Estimates for reverse osmosis exceed current project costs, are more environmentally impacting and do not introduce a second source of water to the community

Q&A



RESPONSE TO LOCAL WATERS PROPOSAL

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Local Waters Proposal

- Entirely dependent on dwindling Virgin River supplies
- Does not provide a critical second source or reserve supply
- Presumes unachievable water use reductions
- Eliminates practically all agriculture in Washington County
- Costs to the community are higher than LPP

Local Waters Proposal

Water Supply Components	Lake Powell Pipeline	Western Resource Advocates Proposal
Additional Agriculture Water Transfers	\$0	\$21,000,000
Lake Powell Pipeline	\$1,417,000,000	\$0
Costs to Achieve Water Use Reductions	\$0	\$1,281,000,000
Other Infrastructure Costs ^a	\$0	\$253,000,000
Total Costs Distinct to Each Alternative^b	\$1,417,000,000	\$1,555,000,000

Notes:

a - Apple Valley Pipeline, agricultural water diversion/distribution facilities, and storage facilities. Does not include reverse osmosis.

b - LPP Alternative is at an AACE Class 4 cost estimate (stated accuracy range = -20% to + 30%); Western Resource Advocates proposal is at an AACE Class 5 cost estimate (stated accuracy range = -30% to + 50%)

Q&A