November 15, 2021

Brian Steed, Executive Director

Utah Department of Natural Resources

1594 W. North Temple

Salt Lake City, Utah 84116

Sent via email to: toddstonely@utah.gov

RE: Comments on the Water Resources Plan

Public Review Draft September 29, 2021

Dear Director Steed,

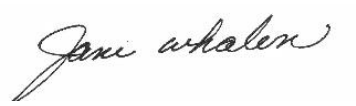
Conserve Southwest Utah (CSU) is a nonprofit organization based in St. George, Utah, established in 2006. Our vision is that Southwest Utah grows in a manner that enables conservation and restoration of its natural and cultural resources. Our mission is to advocate for conservation and stewardship of our area's natural and cultural resources and implement the Smart Growth policies that enable conservation for the benefit of present and future generations.

CSU participated in Governor Herbert's 2017 water strategy team that made recommendations for a 50-year water plan and we want to bring some of the recommendations forward into the draft Water Resources Plan.

While we applaud the State for water planning, we disagree with some of the findings and recommendations in the plan for Washington County.

Following the Introduction, our comments are organized by the chapters and pages in the Draft Plan itself. We also include comments we made on the 2020 Lake Powell Pipeline (LPP) Draft Environmental Impact Statement (DEIS).

Sincerely,



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Introduction

Conserve Southwest Utah (CSU) appreciates the opportunity to comment on the Water Resources Plan - Public Review Draft September 29, 2021 (Plan). The Plan includes valuable water conservation provisions; however, it is silent on how Utah will manage with less water from the Colorado River. It promotes the LPP as a viable option for our water security and the Colorado River as a secure water source for a permanent water project, although the Division of Water Resources (UDWRe) hasn't provided any evidence that it has a senior water right that assures physical water for a permanent water project. UDWRe understates supplies, inflates water demand, continues to ignore cheaper alternatives, doesn't consider climate change reducing the flow of the Colorado River more than 10%, and underestimates reuse potential and water conservation measures that could reduce demand.

Further, the Plan claims Washington County will run out of water in 10 years and that we can't conserve water to reach any less than 240 gallons in per capita per day (gpcd) from the year 2045 to 2075. These flawed assumptions skew the conclusions and appear to be intended to create the need for the LPP. The Plan's focus appears to continue pushing for the LPP without properly vetting the project to determine if it is feasible. The Plan misleads legislators and the public and doesn't disclose the risks of the LPP that will have to depend on the declining Colorado River and could cost the State and taxpayers more than $2 billion in construction costs, and untold operation and maintenance and foregone bonding opportunities for roads, energy, and other public projects. The conclusions of the Plan need more explanation and documentation.

It has been well documented by the Bureau of Reclamation (BOR) that there is more Colorado River water allocated to states than the river produces annually, even without considering a warming climate. Yet, the BOR continues to over-allocate the Colorado River by selling water to Utah from the Colorado River Storage Project (CRSP) while this project is operating in a deficit. The priority of CRSP is to provide the Upper Basin States' Compact obligations to provide 7.5 MAF at Lee Ferry. But the releases from Lake Powell and Lake Mead continue to exceed inflows, and this over-allocation is draining upstream reservoirs faster than anyone predicted. The Colorado River has reached its limit, yet Utah plans to take more water for the LPP based on public assertions of a right to an absolute quantity of water rather than a percentage of the remainder after the Lower Basin states' rights are satisfied. Utah has failed to explain how they compute their Colorado River rights. Therefore, the LPP is not a reliable or secure water supply that residents can depend on. These risks should be disclosed and analyzed in the Plan.

Chapter 3 Water Supply

False Assertions On Total Supply, page 23

UDWRe continues to make false assertions without evidence that without the LPP, the only alternative is Reverse Osmosis (RO) and the elimination of all outdoor irrigation with potable water. They incorrectly base their analysis on the wrong information. CSU has pointed this out in past comments, as have other public commenters. Washington County will not run out of water in 10 years. This needs to be corrected in the final Resources Plan. One of the focus areas of the Plan is reliable supply; therefore, UDWRe needs to verify the water supply in Washington County. By 2060, Washington County Water Conservancy District (WCWCD) stated in the LPP-DEIS that they have 98,528 AFY of water. CSU has identified more water than that could be developed in the future.

According to the LPP DEIS 4.2.5 Water Supply without the LPP, page 9:

> *"The total reliable current and planned water supplies from the local Virgin River basin equals 98,727 acre-feet per year, which is the summed total of the current, reliable water supply (67,677 acre-feet) and the estimated reliable water supply from future non-LPP projects (31,050 acre-feet)."*

WCWCD's Own Declared M&I Supply

Table 1 shows WCWCD's claim that 98,528 AF of existing and future culinary and secondary water supply will be available to the county by 2075. They claimed in LPP-DEIS the available water will not support the projected growth after 2040.

The new demand model in the Plan states Washington County will run out of water in just ten years by 2031. It should explain in the Plan the reason for the change.

Table 1. Water supplies identified in the FERC study reports.	
	AFY
WCWCD - current	32,225
Cities in Washington County	35,273
WC – future (local projects)	13,670
WC – future reuse/secondary (10,000 AG/7,360 reuse)	17,360
Total existing & future supply without LPP	**98,528 (2060)**
Source: Table ES-1 Existing and Future Reliable Culinary Supplies for Washington County 2015 Water Needs Assessment)	

WCWCD Doesn't Count All Water Supplies In Washington County

However, the 98,528 AFY available from local sources by 2075 per the WCWCD ignores many existing water supplies that could be developed locally in the future cited below. Indeed, the WCWCD claims they have plenty of water in the information given to the Fitch credit agency to support its credit rating. The Fitch report reads:1

> *"Fitch Affirms Washington County Water Conservancy District's, UT Water Revs at 'AA'; Outlook Stable*
>
> *"December 18, 2015, 01:40 PM Eastern Standard Time*

1. Business Wire, "Fitch Affirms Washington County Water Conservancy Dist's, UT Water Revs at 'AA'; Outlook Stable", December 18, 2015, at: https://www.businesswire.com/news/home/20151218005863/en/Fitch-Affirms-Washington-County-Water-Conservancy-Dists.

> *"SAN FRANCISCO--(BUSINESS WIRE)--Fitch Ratings has affirmed the following Washington County Water Conservancy District, UT (the district) obligations at 'AA':*
>
> *"About 28 percent of the district's 32,000 acre feet (af) per year of water sources is surplus and will be used to serve future growth and another 13,900 AF will come online in the next few years. The district's typical peak summer demand is 37 million gallons per day (mgd), though usage declined last year due to wet weather, and winter demand is 6-7 mgd compared with capacity of 60 mgd. The district is operating a groundwater recharge program that currently provides access to 100,000 AF of stored water and will ultimately provide up to 300,000 af."*

The LPP DEIS acknowledged 100,000 acre-feet (af) of water in the Sand Hollow Aquifer and the possibility of 300,000 af of water mentioned in the Fitch credit report from the WCWCD to the credit agency. But the WCWCD in the LPP studies only claims 4,000 AFY is the possible yield from the aquifer by 2075. This is a significant disparity in the declared usable water supply that needs better disclosure by the WCWCD in the Plan.

The 2021 Fitch report points out that 177,000 af are held in storage today. It reads:

> *"The district is the primary provider of water in the county and has developed reservoirs and pipelines to provide water on a wholesale basis to municipalities and also provide water on a retail basis within several smaller municipalities and unincorporated areas of the county. Annual supply exceeds 32,000 acre-feet (af), and there is approximately 177,000 af of groundwater recharge storage."*[2]

An Example Of WCWCD Artificially Reducing Supply

Table 2 shows a meager yield from WCWCD's reservoirs and aquifer storage, although they report much higher capacity for their Fitch ratings.[3]

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2. Fitch Affirms Washington County Water Conservancy District, UT's Revs at 'AA+'; Outlook Stable Wed 27 Oct, 2021, at: https://www.fitchratings.com/research/us-public-finance/fitch-affirms-washington-county-water-conservancy-district-ut-revs-at-aa-outlook-stable-27-10-2021

3. Utah Division of Water Resources, "2015 Municipal and Industrial Water Use Data, 2019 Version 2", at: https://water.utah.gov/wp-content/uploads/2019/08/2015-MI-Data-2019-v2.pdf.

Table 2. CSU description of reservoir capacity and yield.		
Storage Facility	**Capacity (af)**	**Declared Yield (afy)**
Quail Creek Reservoir	40,000 (fills every year)	
Sand Hollow Reservoir	50,000 (fills every year)	
Total Reservoir	**90,000**	**26,922**
Sand Hollow Aquifer		
Current, from FITCH report 2021 177,000 af (300,000 af potential storage Fitch report 2015)	177,000	4,000 wells
Total	267,000	30,922

The WCWCD itself reports that the cities have additional supplies not identified as a future water supply by the WCWCD:[4]

> *"Based on the Utah Division of Water Rights point of diversion coverage, there are 1,276 active underground water rights with points of diversion within the Navajo/Kayenta and the Upper Ash creek aquifers. These water rights claim 590 cfs or 332,760 acre-feet/year*

4. Washington County Water Conservancy District Petition for Classification of the Navajo/Kayenta and Upper Ash Creek Aquifers Chapter VI, p. VI-1, at: https://www.wcwcd.org/wp-content/themes/wcwcd/pdf/Classification%20Petition_2005.pdf.

from the petitioned aquifers. Accounting for the fact that some water rights declare more than one type of use, there were 160 commercial water rights, 249 stock watering rights, 296 domestic rights, and 969 irrigation rights (DWR Database, 2000). The Utah Division of Drinking Water indicated there are 23 public water systems with 49 public drinking water wells with water quality data."

While Washington County's water rights are over-allocated, WCWCD only claims 35,452 AFY from cities will be used as supply by 2075.[5] However, the report above reveals the cities and others have much more than 35,452 AFY of water, which they could develop in the future. The WCWCD also doesn't consider all the water supplies in the county that could convert to culinary or secondary use by 2075. For example, Table 3 shows that in 2013 Western Resource Advocates identified 116,300-138,000 AFY of water supplies in Washington County.

Table 3. Water supply alternatives from the Local Waters Alternative analysis.

Supply Alternative	Culinary (AFY)	Secondary (AFY)
WCWCD Current Supplies and Ash Creek	78,400	7,500
Reuse	---	16,900
Agricultural Water Transfers	---	13,700-35,200
Sub-Totals	78,400	38,000-59,600
Total	**116,300-138,000**	

5. UDWRe, "Lake Powell Pipeline Project Water Needs Assessment-FINAL", April 2016, at: https://conserveswu.org/wp-content/uploads/2018/03/FERC-Water-Needs-ASSESSMENT-19-5-5-16-1.pdf

Additional supplies also could include:

1. As agricultural lands are developed, more water will become available for M&I use.
2. Inventory all water resources in the county not counted by the WCWCD as supply.
3. Stormwater capture.[6]
4. Rainwater harvesting.[7]
5. Grey water.

Undeclared Local Water Supply Sources

In arguing the need for the LPP, the WCWCD limits what water sources it considers. However, there are many additional sources it could pursue locally, at lower risk and cost than the LPP:

- **Appropriate accounting of yield from local sources.** Estimates of yield from existing local water supplies should be reviewed by an independent body to assure that they are not being artificially limited or underestimated to justify the LPP. For example, WCWCD claims that Sand Hollow and Quail Lake reservoirs and Sand Hollow aquifer, fed from the Virgin River, can only provide about 30,000 AFY as an annual supply by 2060. Elsewhere,[8] UDWRe projects 113,000 AFY Virgin River depletion to 2050—more than triple the claim of 30,000 AFY. This higher amount of water is not identified in future supplies. These are spring high-water flows that can be stored in reservoirs.
- **Inclusion of water rights from private landowners that convert from agriculture to municipal and residential development.** We do not advocate the development of agricultural land. Still, we recognize that wherever agricultural land is converted to other uses, water could be converted to culinary or secondary use. More analysis is required to account for agricultural water, estimate its conversion rate, and determine its treatment costs.

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6. Shimabuku, M. et al., "Stormwater Capture in California: Innovative Policies and Funding Opportunities", Pacific Institute, June 2018, at: https://pacinst.org/wp-content/uploads/2018/07/Pacific-Institute-Stormwater-Capture-in-California.pdf.

7. Poindexter, J. "23 Awesome DIY Rainwater Harvesting Systems You Can Build at Home", Morning Chores, at: https://morningchores.com/rainwater-harvesting/.

8. UDWRe, "Utah Perspective, The Colorado River", 2nd Edition, May 2002, page 8,see at:https://water.utah.gov/wp-content/uploads/2019/01/TheColoradoRiverart.pdf.

- **Increased reuse and treatment of abundant brackish water.** [9] There are several substantial sources of water considered to be too saline for M&I use. Given the current project cost of the LPP, it would seem wise to review these analyses.
- **Increased use of secondary water for yards and municipal irrigation.** Especially given the conversion of agricultural water, particularly with the high rates of new development, it makes sense to require greater use of secondary water for landscape use. WCWCD claims it has no control over local ordinances, but it can and does have great influence on local policies with respect to water. It makes sense to consider updating local landscape regulations to require better planning for water use in new development.
- **Innovations in water management.** Other alternatives, including undeveloped city water rights, rainwater capture, more careful analysis of increased yield from the Virgin River, and local reservoirs and underlying aquifers, used to seem inconsequential in terms of supply. However, these are significant water sources are ignored in UDWR's Water Needs Assessment for the LPP.
- **Water Use Pricing to signal conservation.** Water budget rates have been shown to reduce water use by 50 percent[10] and pay for themselves over time.
- **Better water demand and supply management planning to lower demand.** It should use industry-standard planning and management processes to develop plans that are executable and accountable in terms of objectives, tasks, schedules, responsibilities, and budget. Existing documents following current UDWRe guidance do not continue these basic elements and therefore are neither executable nor accountable. They will not result in significant water conservation but rather contain background information on infrastructure, current usage, and measures that could be taken. Conservation goals should be tied to estimates of future water supplies and what has been achieved elsewhere. Methods to reduce usage should be studied, ranked, and then incrementally implemented in projects planned to move us toward the goal in measurable steps.

WCWCD Excluding Water Supply

Another way the WCWCD limits the declared water supply is by only counting water as a supply that meets EPA drinking water standards in the county. Instead, the studies should require full disclosure of all water resources in the county. Water treatment of the abundant lower quality

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9. EPA, "Water Reuse and Recycling", 2020, at: https://www.epa.gov/waterreuse.

10. Conserve Southwest Utah, "Water Budget Rates Workshop", held October 30, 2014, see at: https://conserveswu.org/programs/water-conservation/; see workshop summary at: https://conserveswu.org/wp-content/uploads/2014/10/Workshop-Summary-3.pdf.

water in the county would be a cheaper alternative to LPP. Water treatment costs are rapidly decreasing as new technologies and economies of scale drive the costs down as the world is forced to look to these water sources. LPP proponents completely omit this; per a Federal Energy Regulatory Commission study report:

> *"Water supplies that meet the EPA's secondary untreated MCL for drinking water of TDS less than 500 mg/L are deemed usable for culinary purposes in this assessment."*[11]

WCWCD has been unwilling to declare more of its storage as supply. WCWCD only discloses that they will use 30,922 AFY of the Virgin River but still have significantly more Virgin River water rights and groundwater wells.

The Plan concludes that Washington County will run out of water in ten years, although this is not the case; thus, the Plan needs to be corrected.

UDWRe extended the water planning to 2075 for analysis and still doesn't count the WCWCD's Warner Valley Reservoir project as a future supply. WCWCD has available water rights to divert up to 40,000 acre-feet of low-quality water annually from the Virgin River at the Washington Fields Diversion to be stored in a future Warner Valley Reservoir. This project will provide more efficient storage, management, blending, and conservation of these water resources. WCWCD includes this in its plan[12] for 2060 but doesn't identify it as a future supply in the studies. The reservoir has been considered by WCWCD and its predecessors for more than 50 years. There are several technical and engineering challenges that must be overcome before the project can move forward. For example, the reservoir would store Virgin River water unsuitable for culinary and landscape irrigation due to contamination from TDS from local natural hot springs. In the past, treatment possibilities were limited to reverse osmosis, which is expensive and creates complicated environmental impacts (e.g., storing removed salts). However, newer technology promises more cost effective and environmentally friendly solutions to reverse osmosis and other issues associated with Warner Valley Reservoir.

The Plan must quantify the total available water supply holistically and include reasonable increases in yield from other sources such as (i.e., cities, irrigation companies, private landowners, etc.). UDWRe believes Washington County's water supplies are not secure, even

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11. Utah Division of Water Resources, Water Needs Assessment, page 2-10, 2016, at: https://conserveswu.org/wp-content/uploads/2012/04/19DraftWaterNeedsAssessmentReport-1.pdf.

12. UDWRe, "Prepare 2060, A Statewide Water Infrastructure Plan", 2018, at: http://prepare60.com/Content/SWIP.pdf

though the County has dozens of wells, surface diversions, water retailers, and surface and underground reservoirs within the 2,800 square miles of the Virgin River watershed not included in the Plan's water supply analysis is not understandable or reasonable.

Meeting Demand by Reduced Projected Population with Local Supplies

UDWRe's Water Needs Assessment (WNA) 2011 for the LPP DEIS[13] stated that the county by 2060 would grow to a population of 860,378. However, over the years Kern C. Gardner Policy Institute's (Gardner Institute) population projections for 2060 have been lowered to 468,830. Oddly, state studies have also continued to decrease local supply without any explanation, perhaps to continue to justify a need for the LPP. Even though the population projections fell almost in half, the proponents still claim they need the same amount of water.

Pertinent to that question is that UDWRe's and WCWCD's assessment claims that the water supply has decreased substantially. Table 4, extracted from the Water Needs Assessment reports for 2008 and 2016, shows reported supplies in Washington County decreasing by more than 45,000 AFY from 2008 to 2016. It appears that the 2008 WNA shows much more water available than 2016. There are also gaps in the sources, such as Kolob Reservoir, Meadow Hollow Reservoir, Gunlock to Santa Clara Pipeline, Quail Creek Reservoir Agricultural Exchange, and Sand Hollow Well Field Expansion. Quail Creek & Sand Hollow Reservoir quantities have decreased significantly since 2008, as has Sand Hollow Ground Water. The last column shows the maximum of 2008 and 2016, with almost 180,000 AFY available. It is essential that UDWRe explain in detail:

- What are the storage constraints, and why those cannot be overcome before approving the LPP?
- Why has the potential reuse number come down so much?
- What happened to the water sources that appeared on the 2008 water supply table but didn't appear on the 2016 tables?
- Why is agricultural conversion less in 2016 than in 2008 - land already developed? Water included in M&I numbers now?

Table 4. Water sources from Water Needs Assessments in 2008 and 2016.				
Supplies (existing & potential)	**Use**	**2008 WNA (AFY)**	**2016 WNA (AFY)**	**Max of 2008/2011**
Quail Creek & Sand Hallow Reservoirs	Culinary	29,500	24,922	29,500
Sand Hollow Ground Water	Culinary	8,000	4,000	8,000
Kolob Reservoir	Culinary	2,000		2,000
Meadow Hollow Reservoir	Culinary	200		200
Cottam Well Field	Culinary	2,000	600	2,000
Sullivan Well Field	Culinary	750	750	750
Pintura Well	Culinary		600	600
Diamond Valley Well	Culinary		400	400
Kayenta (Ence Wells) System	Culinary	1,000	730	1,000
Gunlock to Santa Clara PL	Secondary	2,500		2,500
Toquerville Sec Water Sys	Secondary	160	178	178
Ash Creek PL	Culinary	5,000	2,840	5,000
Crystal Creek PL	Culinary	2,000	2,000	2,000
Quail Creek Reservoir Ag Exch	Culinary	4,000		4,000
Sand Hollow Well Field Expansion	Culinary?			-

Table 4. Water sources from Water Needs Assessments in 2008 and 2016.				
Supplies (existing & potential)	**Use**	**2008 WNA (AFY)**	**2016 WNA (AFY)**	**Max of 2008/2011**
Sand Hollow Recharge & Recovery	Culinary?		3,000	3,000
Cottam Well Maximization	Culinary		600	600
Westside Arsenic Treatment	Culinary		5,000	5,000
Subtotal WCWCD Sources		**57,110**	**45,620**	**66,728**
Municipal Supplies (2016 WNA)		35,425	35,425	35,425
Maximize Existing Wastewater Reuse	Secondary	1,700	7,300	7,300
Ag Conversion from Development	Secondary	12,400	10,080	12,400
Existing Wastewater Reuse	Secondary			-
Potential Future Wastewater Reuse	Secondary	54,500	17,380	54,500
Total		**161,135**	**115,805**	**176,353**

UDWRe has inexplicably reduced its estimates of supply. Figure 1 is reproduced from the 2001 Utah State Water Plan and shows 247,000 acre-feet per year (afy) as the water supply for the Kanab Creek/Virgin River basin. However, the Figure 2 from the Plan (page 28) shows a much lower water supply at 79,100 AFY.[14] The massive change in water supply statewide and for the Kanab/Virgin area should be explained. The Plan should detail all water supplies and explain any such major changes.

14. Utah Division of Water Resources, " 2015 Municipal and Industrial Water Use data, 2019 version 2," at https://water.utah.gov/wp-content/uploads/2019/08/2015-MI-Data-2019-v2.pdf

Estimated Water Supply by Basin

Basin	Water Supply (acre-feet/yr)*
Bear River	2,106,000
Jordan River & Utah Lake	1,278,000
Weber River	1,046,000
Sevier River	819,000
Uintah	688,000
West Colorado River	446,000
West Desert	329,000
Kanab Creek/Virgin River	247,000
Cedar/Beaver	216,000
Southeast Colorado River	136,000
TOTAL	**7,311,000**

* Values based on 1961-1990 period of record. For developable supplies, see Table 5.

Figure 1. Estimated Water Supply by Basin from 2001 State Water Plan.

Table 3-1 Total Reliable Supply by Basin (2015)

Basin	Potable Supply (ac-ft)				Secondary Use (ac-ft)	Total Reliable Supply (ac-ft)
	Wells	Springs	Surface	Total		
Bear River	59,200	46,800	34,000	140,000	14,800	154,800
Cedar/Beaver	21,100	3,600	-	24,700	4,500	29,200
Jordan River	99,000	6,500	179,400	284,900	30,700	315,600
Kanab Creek/Virgin River	30,200	8,500	27,400	66,100	13,000	79,100
Sevier River	21,100	22,400	-	43,500	11,900	55,400
Southeast Colorado River	5,900	2,900	4,100	12,900	1,500	14,400
Uintah	4,900	9,700	37,500	52,100	4,600	56,700
Utah Lake	152,900	57,800	49,000	259,700	60,500	320,200
Weber River	99,100	9,200	87,500	195,800	92,500	288,300
West Colorado River	1,700	9,100	15,600	26,400	8,400	34,800
West Desert	22,700	5,000	-	27,700	4,000	31,700
State Total	**517,800**	**181,300**	**434,500**	**1,133,600**	**246,500**	**1,380,100**

Data source: 2015 Municipal and Industrial Water Use Data Report version3. 2020. Table A-3, A-4 Reliable Potable Supply by Basin.

Figure 2. Reliable Supply from 2021 Draft Water Resources Plan, page 28.

We understand and support the goal of reliable water supplies, but we haven't found credible or reasonable estimates over the years. These two figures highlight some of our quandaries. The UDWRe should develop a standard for cities and other agencies on depletions and diversions. On page 34 of the Plan, Kanab/Virgin has 82,300 afy as a diversion and 48,000 afy M&I depletion. However, in reports on agriculture, only 24,000 afy will convert to culinary by 2060. It is difficult to trust any particular report because they are always different.

120,000 AFY Can Service a Population of 500,000

An analysis completed by WaterDM for Western Resource Advocates analyzed the population that could be served by yields similar to those in Washington County:[15]

> *"What Hypothetical Population Could Be Served by 120,000 AF?*

15. Western Resource Advocates, " Local Waters Alternative to the Lake Powell Pipeline 2.0," at: https://westernresourceadvocates.org/publications/local-waters-alternative-to-the-lake-powell-pipeline-2-0/

"The LPP-DEIS reports reliable water supply for the WCWCD of approximately 120,000 AF. For many water providers in the west, this would be an ample supply into the future to cover a population similar to Washington County. How many people in Tucson or Las Vegas or Denver could be served by 120,000 AF of supply, given their reported usage? Using potable production data from the Maddaus Report [commissioned by WCWCD], WaterDM calculated the hypothetical population in each of the comparison communities that could be served by 120,000 AF of supply, which approximates the reported current available supply in Washington County. This analysis shows how many people could be served today in each of these communities with the approximate volume of supply available to Washington County.

"The results are presented in Figure 12 [our Figure 4] *and they show that all of the comparison communities identified in the Maddaus Report could serve a hypothetical population of more than 500,000 people with 120,000 AF supply. This compares to WCWCD estimates that it could only serve a future population of 374,000 with this volume because of excessive outdoor water use. Figure 12: Hypothetical population that could be served with 120,000 AF91 91 Calculated using gpcd derived from Maddaus Report. 57 A lower level of average consumption is also to be expected as Washington County grows and densifies. Adding another 300,000 residents in the next 50 years will require a different style of development. With a population of 550,000, the typical home in Washington County will be smaller with a smaller landscape. Even if the Lake Powell Pipeline is constructed, water rates in Washington County must necessarily increase to pay for the new supply. As a result of those price and rate increases, elastic components of water demand such as outdoor use will decrease."*

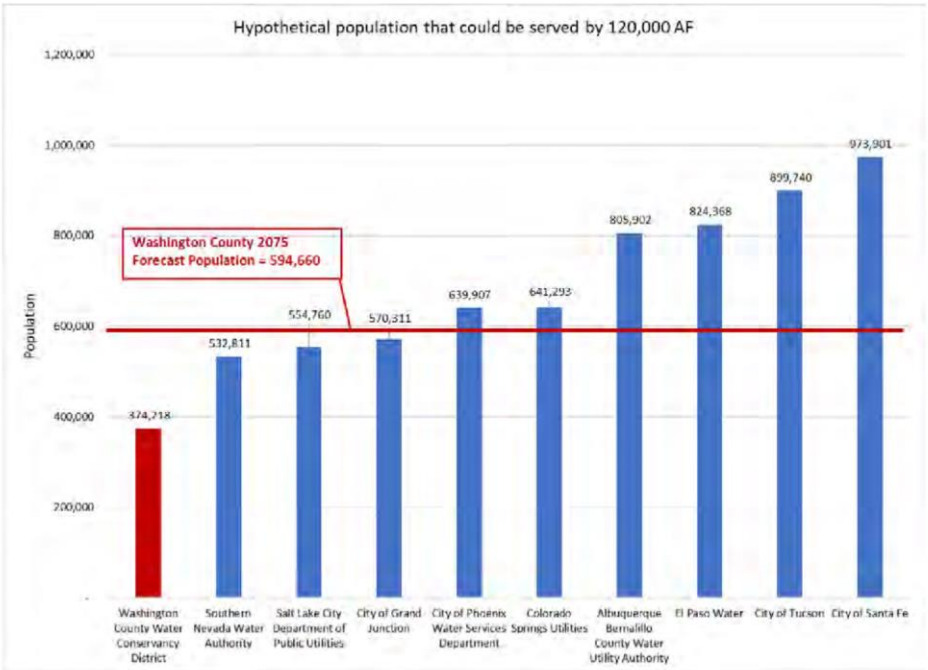

Figure 12: Hypothetical population that could be served with 120,000 AF[91]

Figure 3. Hypothetical population served by 120,000 afy (reproduced from Western Resource Advocates Local Waters Alternative 2.0, page 56).

> *A lower level of average consumption is also to be expected as Washington County grows and densifies. Adding another 300,000 residents in the next 50 years will require a different style of development. With a population of 550,000, the typical home in Washington County will be smaller with a smaller landscape. Even if the Lake Powell Pipeline is constructed, water rates in Washington County must necessarily increase to pay for the new supply. As a result of those price and rate increases, elastic components of water demand such as outdoor use will decrease.*
>
> *If Washington County can adapt its water use patterns over the next 50 years to be similar to those in Grand Junction or Salt Lake City or Colorado Springs, then the volume of supply provided from the Virgin River and other local resources will be more than sufficient to meet the future population anticipated in the Gardner Center forecasts. This demonstrates that this level of consumption is not only possible, but also typical of communities in the western US – a normal level of water use. By adapting its water demand to a similar level as other communities across the US, the WCWCD can avoid*

the expensive, risky, and controversial Lake Powell Pipeline and thrive and grow within the available current supply.[16]

Climate Change Inadequately Accounted

From The Plan, page 41:

> *"Planning for adaptation and mitigation measures to manage and respond to climate change is widely accepted in water planning circles today. Climate change estimates are used to review the suitability of current and planned water resources practices, policies, and infrastructure. The Division is working to evaluate and analyze how, where, and when climate risks will impact Utah's water resources. To plan for adaptation and mitigate the potential changes, climate change is accounted for in water models.*
>
> *"The Division is currently using a 10% net increase in evapotranspiration by 2065 in the water demand model (see Chapter 4) and a possible reduction of 10% in future reliable supplies (see Chapter 6)."*

The Plan underestimates the impact of climate change by only considering a 10% reduction in Colorado River supplies by 2075. UDWRe makes the wrong assumption that the Colorado River provides a secure and reliable second water source. UDWRe ignores climate science in the studies that detail how the Colorado River will not be a secure or reliable water source for the LPP. UDWRe needs to disclose its reasoning considering scientific studies that dispute that claim. Utah depends on its share of the Colorado River, and it deserves a serious discussion in the Plan of water availability to 2075 and beyond. The Plan should include how it could manage with less water from the Colorado River, including how it could repay debt for the LPP if water from Lake Powell is not adequate 100% of the time.

According to the BOR, water demand for Colorado River water has outstripped supply since 2002. The BOR said, in estimating the "natural flow" of the Colorado River (what the unregulated, un-diverted streamflow would have been, absent human intervention):

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16. Western Resource Advocates, " Local Waters Alternative to the Lake Powell Pipeline 2.0," at: https://westernresourceadvocates.org/publications/local-waters-alternative-to-the-lake-powell-pipeline-2-0/, page 56-57

> *"[the] apportioned water following the Law of River exceeds the approximate 100 year average 'natural flow' of the river of 15 million acre feet year (MAFY) at Lee Ferry and is 16.4 MAFY."*[17]

> *"The Basin faces a wide range of plausible future long-term imbalance between supply and demand. This imbalance computed as a 10-year running average ranges from no imbalance to 6 MAF with a median of 3.2 MAF in 2060."*[18]

The reality is that river flows at Lee Ferry during the last 15 years have only been 12.5 - 13 mafy. Yet, these diminishing flows are not used in forecasting water availability for the LPP by UDWRe, the Upper Colorado River Basin River Commission, or BOR. Unfortunately, UDWRe appears to be advocating for more diversions even if the water is not physically available, putting the state and communities at economic risk.

Bradley Udall and Jonathan Overpeck's 2017 research article explains the risks to Utah from lower flows for the Upper Basin States:[19]

> *"2000 and 2014 annual Colorado River flows averaged 19 percent below 1906-1999 average, the worst 15-year drought on record. One third or more of the decline was likely due to warming."*

> *"The Upper Basin also has serious issues, one of which ripples into the Lower Basin. Under such low reservoir conditions, there is also a high likelihood that the Upper Basin states would have to curtail existing water deliveries to cities such as Denver, Colorado Springs, Albuquerque, and Salt Lake City in order to make required deliveries to Lake Mead. Heretofore, largely because of the structure of the Colorado River Compact, the Upper Basin and Lower Basin have been managed separately. With permanent flow declines of*

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17. Colorado River Basin Stakeholders Moving Forward to address Challenges identified in the Colorado River Basin Water Supply and Demand Study, Phase 1 Report: Executive Summary, Bureau of Reclamation, May 2015. and https://www.usbr.gov/lc/region/programs/crbstudy/FactSheet_June2013.pdf

18. Colorado River Basin Stakeholders Moving Forward to address Challenges identified in the Colorado River Basin Water Supply and Demand Study, Phase 1 Report: Executive Summary, Bureau of Reclamation, May 2015, page 3.

19. Udall, B and Overpeck, J. "The Twenty-First Century Colorado River hot drought and implications for the future", AGU Water Resources Research, 4 March 2017, pages 2404, 2407, at http://conserveswu.org/wp-content/uploads/Udall_et_al-2017-Water_Resources_Research.pdf.

approximately 20 percent, however, the required deliveries to Lake Mead would become a hardship on the Upper Basin, as well as create Lower Basin delivery shortages [Reclamation, 2007; Barnett and Pierce, 2009; Rajagopalan et al., 2009]. The original compact, signed during one of the wettest periods in the last 450 years [Woodhouse et al., 2006], did not envision how large scale flow declines would be managed between the basins, and such declines could cause an allocation crisis between the Upper and Lower Basins [Adler, 2008]."

Global Climate Model (GCM) Projections

The BOR's 2012 Colorado River Basin Water Supply and Demand Study (Basin Study), Technical Report B – Water Supply Assessment estimated possible future flow reductions by using the Global Climate Model (GCM) projections.

Information on the GCM from the Basin Study includes the following, from "8.0 Future Supply under the Downscaled GCM Projected Scenario, 8.1 Methods," page B-43:[20]

> *"Future changes in climate variability and trends, and their influence on streamflow and Basin water supply, have been studied by several researchers in recent years, and GCM future projections indicate that the climate may exhibit trends and variability over the next 50 years beyond what has occurred historically. The Downscaled GCM Projected scenario is one representation of this plausible future condition."*

And on page B-81,

> *"Similarly, table B-3 summarizes the annual and monthly statistics for the Downscaled GCM Projected scenario for three distinct future periods (2011 to 2040, 2041 to 2070, and 2066 to 2095) to assist in the evaluation of temporal trends. It should be noted that the last of these three periods is beyond the Study period but is shown to assist in the understanding trajectory of projected changes. Under this scenario, mean annual flows are expected to continue to*

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20. BOR, "Colorado River Basin Water Supply and Demand Study", Technical Report B- Water Supply Assessment, Table B-2, Dec 2012, page B-82, at: https://www.usbr.gov/lc/region/programs/crbstudy/finalreport/Technical percent20Report percent20B percent20-percent20Water percent20Supply percent20Assessment/TR-B_Water_Supply_Assessment_FINAL.pdf

decrease over time (from -7.5 percent around 2025 to -10.9 percent around 2055, to -12.4 percent around 2080) as compared to the 1906 to 2007 mean. At the same time, the shift in peak streamflow timing evolves from a current peak in June to an eventual peak in May due to earlier snowmelt and increased rain-to-snow ratios in response to warming."

Table 5 is excerpted from Table B-3 in the BOR's study. It shows statistics of different expected Colorado River flows at Lee Ferry for three periods, 2011–2040 (2025), 2041–2070 (2055), and 2066–2095 (2080).

Table 5. Global Climate Model outputs of Colorado River Flows based on three future year time periods: 2011–2040 (2025), 2041–2070 (2055), and 2066–2095 (2080).

	Statistic	Downscaled GCM Projected 2011–2040 (2025) (maf)	Downscaled GCM Projected 2041–2070 (2055) (maf)	Downscaled GCM Projected 2066–2095 (2080) (maf)
Annual water year	Annual (Water Year) Average Annual Flow	13.9	13.4	13.1
	Percent Change from Long-Term Mean (1906–2007)	-7.5 percent	-10.9 percent	-12.4 percent
	Median	13.8	13.3	13.4

If there is only 13.4 MAFY as an annual flow at Lee Ferry, there is not enough water for the LPP.

LPP Is Not a Reliable Source of Water

The Plan only considers a 10% reduction in flows, but climate science generally concurs the reduction will be much more by 2075.

Conserve Southwest Utah requested that Ben Harding from Lynker Technologies, an expert on Colorado River hydrological modeling, review the Lake Powell Pipeline's Draft Environmental Impact Statement. Mr. Harding wrote an 18-page memorandum of his comments. He found that the Lake Powell Pipeline will not be a reliable source of water for Washington County. From the Lynker Memorandum:[21]

> *"The Lake Powell Pipeline Project (the Project) is proposed to deliver 86,249 acre-feet (af) of water annually from Lake Powell to Washington County, Utah. The DEIS infers that this full amount would be available every year, but in fact in many years the Project would almost certainly be limited to a lower or to no yield by curtailments under the Colorado River Compact and the Upper Colorado River Basin Compact arising from a flow shortfall on the Colorado River at Lee Ferry (Castle and Fleck, 2019; Harding, 2019). These curtailments would reduce the reliability of the project (and its average, long-term yield) and would consequently reduce the ability of the project to fulfill its declared purpose and need and would reduce its water supply benefits. What is generally unrecognized is that these curtailments are also mechanisms whereby operation of the Project can impair the operation of other more senior Colorado River water rights in Utah, and Colorado River water rights in the States of the Lower Division, impacts that have not been addressed in the DEIS.*
>
> *"The DEIS has also employed analytical methodological choices that overstate the performance of the project and understate its impact on other water rights, and it has not reported analytical results that directly quantify the expected reliability and impacts of the project. The results that are presented in the DEIS suggest that the Project would not be able to deliver its full yield, and possibly any yield, on average about every 4 to 7 years. In any year in which the Project is fully curtailed an impairment of other water rights would almost certainly occur.*

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21. Harding, B., Memorandum prepared for Conserve Southwest Utah: "Lake Powell Pipeline, Draft Environmental Impact Statement", Lynker Technologies, LLC, July 28, 2020, full text at: https://conserveswu.org/wp-content/uploads/2020/08/Ben-Harding-FINAL-July-2020.pdf

"The DEIS is deficient for the following reasons:

- *"It assumes that the Project will be 100% reliable, that is that it will supply its nominal yield of 86,249 af every year during its operational life. The available evidence and analyses suggest that the project yield will be reduced or eliminated in many years due to curtailments of water use in Utah under the Colorado River Compact and the Upper Colorado River Basin Compact;*

- *"It does not evaluate and describe the degree to which curtailments caused by the Project would cause impairment of senior water rights within Utah;*

- *"It does not evaluate and describe the degree to which depletions from Lake Powell by the Project could impair water rights in the Lower Basin;*

- *"It does not evaluate and quantify the effect of climate change on the performance of the Project; it simply assumes that the Project will be able to deliver its nominal yield in every year during its operational life;*

- *"The hydrology analyses on which the DEIS is based, and Reclamation's 2012 Basin Supply and Demand Study suggest that the project will be unable to deliver its full yield or any yield at all in many years in the future, but the results of these analyses are ignored in the DEIS;*

- *"The hydrology analyses on which the DEIS is based and Reclamation's 2012 Basin Supply and Demand Study have methodological shortcomings that result in an overstatement of the performance of the Project and understatement of its impacts."*[22]

These issues are addressed in detail in the rest of his memorandum.

Therefore, the Plan's assumptions that the LPP will be a reliable source of water are based on flawed information. The State may have a valid paper water right, but there is no physical water

22. Ibid, pages 1-18.

to develop the water right because the Colorado River physical water is over-allocated. The LPP DEIS lacked any information on how much physical water the Colorado River Basin states can share and rely on for the long term. This is supposed to occur in future negotiations with the Colorado Basin States, leading to uncertainty for this project.

Utah's Colorado River Allocation Is Not a Fixed Amount of Water

> *"The DEIS cites recent published research by Udall and Overpeck (2017) and Milly and Dunne (2020) to support projections of lower flows on the Virgin River, and thus larger WCWCD supply shortfalls. However, the results in both Udall and Overpeck and Milly and Dunne encompass the entire Upper Colorado River Basin and can be directly applied to natural flow at Lee Ferry. The expected value of flow changes at 2050 ranged from -7% to -27% for Udall and Overpeck and -14% to -31% for Milly and Dunne. Very roughly speaking, these projections translate to reductions in water available to Utah of 240 thousand AFY (kaf) to 1 MAFY."*[23]

A 7 percent reduction to Utah's 23 percent of the Upper Basin's theoretical allocations when the Colorado River was flowing 15 million afy means a reduction of 240,000 afy to Utah. Utah assumes it has 361,000 af left to use (23 percent of 15 million afy less the 7.5 million afy that must be guaranteed to the Lower Basin). If the reductions in Colorado River flows are actually greater, as scientists predict with reductions due to climate change, any remaining water would belong to the Native American Tribes that have senior rights over Utah's.

More importantly, Utah's allocation is not a fixed amount of water; it is only 23 percent of the available water in the Upper Basin and is only available after senior water rights holders are met. Figure 4 (slides from a presentation by the UDWRe) and Table 5 show how the UDWRe is thinking about Utah's water from the Colorado River. Note that Utah's Colorado River water is already allocated, and Utah has not provided for a situation—such as due to climate change—where there is significantly less flow in the Colorado River.

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23. Based on a long-term average flow at Lee Ferry of 15 MAFY. A 7% reduction of 15 MAFY is 1.05 MAFY, which would be borne by the Upper Division states. Utah is apportioned 23% of the water available to the Upper Division states; its share of the 7% reduction is thus about 240,000 AFY. Harding, B., "Memorandum to Conserve Southwest Utah: Lake Powell Pipeline, Draft Environmental Impact Statement", Lynker Technologies LLC, July 28, 2020, page 7, (See at: https://conserveswu.org/wp-content/uploads/2020/08/Ben-Harding-FINAL-July-2020.pdf).

361,500 AF

TOTAL **1007.5**

Potential Depletion
Approved Applications (Undeveloped)

Applicant	Quantity (Ac Ft)
San Juan County WCD	30,000
Central Utah WCD	29,500
Board of W R (et al)	158,000
Wayne County WCD	50,000
Kane County WCD	30,000
Sanpete WCD	5,600
Uintah County WCD	5,000
Others	80,000*
Ute Tribe ?	105,000
TOTAL	493,100

Figure 4. Utah's Misstatements of Depletion Rights to Colorado River.

Table 6 shows UDWRe's proposed uses of water from the Colorado River.

Table 6. Proposed new uses for Colorado River Water.

Utah's planned new users of Colorado River	Utah's Total Proposed Allocations(Assuming 1.369 mafy is available, used (afy)
Ute Tribe Reserved Water (unsettled)	105,000
Navajo Nation Reserved Water (passed Congress)	81,000
Lake Powell Pipeline	86,000
New Agricultural Uses	40,000
New M&I Uses	29,000
Total new planned uses	**361,000**

Therefore, the LPP water right is a paper water right. The primary reasons for the difference between the paper water and actual wet water are: 1) the priority date of the water right; and 2) the reliability of the water source to supply adequate water, particularly during drought conditions. The priority date is very important because in Utah law, the water right(s) with the earliest priority date receives their full supply before water rights with a later priority date are delivered water.

Our recommendation is that the Governor request the BOR complete a hydrological determination to determine the safe yield using the reduced annual flow of approximately 13 mafy for Colorado River flow at Lee Ferry.

Chapter 4 Water Use Trends & Projections (Demand)

The Water Demand Model includes inflated numbers to show a need for the LPP. For example:

1. It stretches the population from the year 2061 to 2075.
2. It adds a 15.4 % water loss every year to the year 2075 with no reduction.
3. It adds an arbitrary 15-year water supply "reserve buffer" requirement that calculated water demand for 2060 but calculated now for a 2075 population.
4. There is no conservation increase from 2045 for thirty years to 2075, which is highly unlikely.
5. It overestimates water demand by including irrigation company water shares in GPCD.
6. Underestimates reuse potential.
7. Limits local supplies by not counting all the water supplies in Washington County.
8. Not considering that raising the price of water will reduce water demand.

The LPP-DEIS noted that the population growth decreased from 2061 to 2075. From the DEIS 6.2.2 Future Water Requirements, page 13:

> *"Estimating total annual water demand in 2060 for Washington County was based on the following generalized equation: Water demand in 2060 must include population projections out to 2075 because the WCWCD incorporates a 15-year reserve buffer. To estimate the population from 2061 to 2075, a constant rate of increase of approximately 1.0174 was applied to the previous year's population projection. This value was used because it was the rate of increase between 2059 and 2060 (the last year before the planning period*

ends) and because it was the lowest rate of population increase from 2020 to 2060, therefore, representing a conservative estimate."

BOR maintains that it cannot forecast water conservation more than 25 years in the future, so cannot reduce demand after 2045, but then uses assumptions even further into the future to justify the LPP based on a 15-year "reserve buffer." Further, Figure 4, created from population projection data from the Gardner Institute,[24] shows growth projections as percent increases, which are continuing to decline as 2060 approaches, so, if anything, even lower growth rates should be used. A scenario planning tool using a lower population growth rate should be used in the Demand Model.

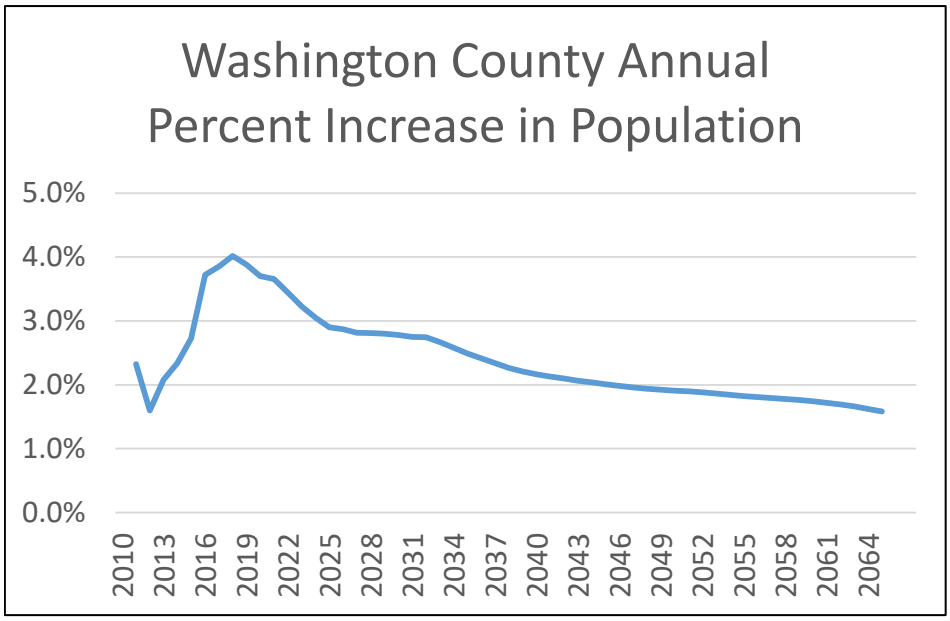

Figure 5. Washington County annual percent increase in population forecast by Gardner Institute.

The Plan projects population growth to justify large water projects by assuming more population means greater water demand. There are two problems with this logic. First, even the Gardner Institute projects show dramatically slower growth in Washington County after 2030. Second population growth does not always require additional water. Cities in the southwest are finding

24. Gardner Policy Institute, "Utah's Long-term Demographic and Economic Projections", July 1, 2017, at: https://gardner.utah.edu/wp-content/uploads/Kem-C.-Gardner-County-Detail-Document.pdf.

that is not true; LPP proponents are trying to inflate the need for water. Put simply, we are consistently using less water even as populations grow. In almost all municipal areas served with Colorado River water, per capita M&I water use is going down, not up, despite population growth. "*We have been getting it wrong for a century.*"[25] Indeed, some cities are still growing rapidly while using less water.[26]

Add to that fact that in 2017 the Gardner Institute projected Washington County's 2060 population at 468,830[27], which is 400,000 less than the 860,378 that was predicted in UDWRe's Water Needs Assessment to FERC just six years earlier. However, to still show the need for the LPP, the proponents must come with creative ways to show more need by now adding a water supply reserve for a population 15 years beyond their projects, as well as a 15 percent water system loss for a total of adding 30 percent more water by 2060.

Of more local interest, according to René Fleming, St. George City Water and Energy Conservation Coordinator, water use in St. George is not growing with population growth:[28]

> *"In 2010, water use reported on the annual reporting the State requires was about 27,000 acre feet. In 2017 it was about 24,000, and the population grew from roughly over 70,000 to above 80,000 in the same time period.*
>
> *"Vegetative cover has decreased by about 16 percent. I have a PowerPoint slide with an aerial view of a home in 1998 with a lot of grass and a similar sized lot and home in 2018 that is mostly xeriscaped."*

Indeed, St. George City uses the same amount of water in 2019 as it did in 2010, even though the population had grown from roughly 70,000 to above 80,000 in the same period. A significant reason is that vegetative cover has decreased by about sixteen percent. LPP proponents' claim that the water demand will grow significantly with population growth needs to be reevaluated in

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25. Kuhn, E. and J. Fleck, Science be Dammed, How ignoring Inconvenient Science Drained the Colorado River, University of Arizona Press, 2019, p. 215.

26. Fast Company, article April 25, 2011, at: https://www.fastcompany.com/1749643/the-big-thirst-nothings-quite-so-thirsty-as-a-las-vegas-golf-course.

27. Gardner Policy Institute, "Utah's Long-term Demographic and Economic Projections", July 1, 2017, at: https://gardner.utah.edu/wp-content/uploads/Kem-C.-Gardner-County-Detail-Document.pdf.

28. Email from René Fleming, Manager Of Energy And Water Customer Services, Water and Power Administration, to Jane Whalen, dated September 24, 2019.

the Plan because that is not the case. LPP proponents must be required to provide evidence of their claims otherwise.

Las Vegas provides another example of growth using less water.[29]

> *"In the last 20 years, per capita water use in Las Vegas for all purposes has fallen 108 gallons a day, from 348 gallons per person a day to 240 gallons.*
>
> *"You don't accomplish that by turning off the water while you brush your teeth (although that helps). You have to fundamentally change people's approach and attitude about water.*
>
> *"In the last 10 years, Las Vegas has grown by 50 percent in population, but the actual use of water hasn't changed at all. The conservation has, in fact, enabled the growth."*

Authors Eric Kuhn, retired General Manager of the Colorado River Water Conservancy District, and John Fleck, director of the University of New Mexico's Water Resources Program, in their book, Science Be Dammed, wrote:[30]

> *"The widespread presumption that population growth means growing water demand drives much of the politics of water planning in the Colorado River Basin. But it is wrong. Simply put, we are consistently using less water. In almost all the municipal areas served with Colorado River water, water use is going down, not up, despite population growth. Water use in the basin's major agricultural regions also is going down, even as agricultural productivity continues to rise. This is not limited to the Colorado River Basin. Such "decoupling" between water use, population, and economies is common across the United States."*

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29. Fast Company, article April 25, 2011, at: https://www.fastcompany.com/1749643/the-big-thirst-nothings-quite-so-thirsty-as-a-las-vegas-golf-course.

30. Utah Public Radio interview with E. Kuhn and J. Fleck, authors of Science be Dammed, How ignoring Inconvenient Science Drained the Colorado River, 2019, p. 215, at: https://www.upr.org/post/science-be-damned-water-rights-and-scarcity-eric-kuhn-wednesdays-access-utah.

Author John Fleck in an interview with the Public Policy Institute of California[31], responding to a question, "What are the main reasons Californians are using less Colorado River water?", described the Metropolitan Water District of Southern California's (MWD) experience:

> *"Prior to the early 2000s, MWD generally took the maximum it could from the Colorado River, usually more than a million acre-feet per year. In recent decades, it has substantially reduced its dependence on Colorado, only taking a full supply in years of State Water Project shortage. Water conservation has been an enormous success in Southern California. There was a lot of progress in conservation during the latest drought, and even after it ended. We're seeing a lot more effective use of water in the basin, with a growing emphasis on groundwater recharge, stormwater capture, and reuse efforts."*

Instead, a more up-to-date evaluation of water demand resulting from a concerted water management program is needed. Conserve Southwest Utah hired WaterDM to analyze the LPP. Here is an excerpt regarding how water efficiency impacts were not considered after 2045:

> *"The forecast for Washington County in the year 2075 would place its water use among the very highest water using communities in the western US today and in the future. With the Lake Powell Pipeline, Washington County must necessarily also have high water rates. Through rates, a strong price signal is proven effective at reducing consumption, even in communities with second homes and significant irrigation volumes. Yet, the DEIS has shown no efficiency improvements or demand reductions in Washington County for 30 years.*
>
> *"It is unclear why efficiency improvements are stopped in 2045. This is neither reasonable nor realistic, particularly given the anticipated impacts of climate change, which will drive up the cost of providing water and reduce supplies. All of the new demand in Washington County will come from new residents and new buildings that will be constructed in compliance with modern plumbing codes and standards. These national codes and standards, such and the 1992 Energy Policy Act, require that all toilets sold in the US use 1.6 gallons per flush or less. Stores like Home Depot only offer EPA WaterSense certified toilets use at 1.28 gallons per flush or less. New buildings will necessarily be more water-efficient than old buildings. Assuming future water*

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31. Public Policy Institute of California, interview with John Fleck, author of Science be Dammed, How ignoring Inconvenient Science Drained the Colorado River, March 2, 2020, at: https://www.ppic.org/blog/why-the-big-drop-in-californias-colorado-river-water-use/.

use in 2075 will be the same as in 2045 without efficiency improvement is not reasonable and not a sound basis for least-cost infrastructure planning.

"Recent failures of demand forecasting (discussed below) have exposed demand forecasting methods that fail to include long-term efficiency improvements; thus, water efficiency and efficiency improvement are now standard considerations for most demand forecasts. These forecasting failures have been mainly due to inflated future per capita demands and inflated population forecasts – two problems clearly evident in the DEIS.

"The changes and efficiency improvements that have been made in indoor residential water use are documented in research conducted by the Water Research Foundation and documented by the American Water Works Association. A summary is presented in Table 6. These data shown that modern, water efficiency homes in the US will use about 40 gpcd indoors. In the future they could use even less."

Table 7 shows typical in-home demand for water. The total of less than 40 gpcd for household use shows that most of the household use is for something else outside the home; and that something else is primarily irrigation of lawns that can be easily reduced.

Table 7. Summary of per capita use from Residential End Uses of Water Studies (REUWS) (gallons per capita per day).

Toilet	18.5	14.2	7.7
Clothes Washer	15	9.6	4.4
Faucet	10.9	11.1	8.1
Shower	11.6	11.1	11.0
Dishwasher	1.0	0.7	0.5
Leak	9.5	7.9	5.0
Bath	1.2	1.5	1.5
Other	1.6	2.5	1.6
Indoor Total	**69.3**	**58.6**	**39.8**

Sources: Mayer, P.W., W.B. DeOreo, et. al. 1999. Residential End Uses of Water. American Water Works Association Research Foundation, Denver, CO.; DeOreo, W.B., P. Mayer, J. Kiefer, and B. Dziegielewski. 2016. Residential End Uses of Water, Version 2. Water Research Foundation. Denver, CO; W.B. DeOreo, A. Dieteman, T. Skeel, P. Mayer, et. al. 2001. Retrofit Realities. Journal American Water Works Association, March 2001.

A major emerging trend in water utilities in the use of advanced metering infrastructure (AMI) to detect customer leaks and alert customers about abnormal usage. Recent research has shown that these programs are capable of reducing customer-side leakage by about 50%.[32] As the cost of

32. San Francisco Water Power Sewer, Leak Alert Program", accessed September 5, 2020, at: https://sfwater.org/index.aspx?page=947.

water increases over the next 50 years, outdoor use will become more and more expensive, and landscaping will be adapted accordingly.[33]

WaterDM also noted that the demand model for secondary water use also improperly forecasted demand. According to WaterDM:

> *"Baked into the DEIS demand forecast is a substantial component of secondary water use…secondary water use accounts for about 20% of 2015 demand once water losses are included.*

Secondary water is defined as "non-potable or untreated water that does not meet EPA Safe Drinking Water requirements. Generally, irrigation and canal companies deliver secondary water through open ditch systems or pressurized pipelines for irrigation of lawns, gardens, landscape, parks, cemeteries, golf courses, and other open areas."[34]

Because secondary water use is embedded into the 2015 water demand of 302 gpcd (71 gpcd is secondary water), secondary water demand is necessarily increased throughout the 60-year forecast. In Washington County today, most of the secondary water is supplied by irrigation companies with limited water rights, about 8,450 AFY. These supplies cannot possibly grow proportionally with population into the future, as shown, yet they have been improperly embedded into the 2015 baseline demand.

Even with the 20% conservation factor applied through 2045, secondary water use must necessarily increase through the demand forecast and after 2045 because of the forecasting method used. This is not reasonable. The LPP should not be constructed to provide secondary water use for irrigation, rather the project is only properly considered as a potable supply. Use of secondary water is seasonal, thus including it as part of the annual gpcd is misleading from the perspective of supply timing as well.

Secondary water is a separate supply and thus demand for secondary water should be determined distinctly from the potable demand into the future. Lumping them together, as has been done in the DEIS, is improper from multiple planning and forecasting perspectives and should be

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33 Western Resource Advocates, " Local Waters Alternative to the Lake Powell Pipeline 2.0," at: https://westernresourceadvocates.org/publications/local-waters-alternative-to-the-lake-powell-pipeline-2-0/

34. 2015 Municipal and Industrial Water Use Data. 2020 version 3, Division of Water Resources, page 5, at: https://water.utah.gov/wp-content/uploads/2020/07/2015WaterDataV3.pdf.

corrected. WaterDM estimates that including secondary water in the demand forecast has improperly inflated per capita demands in the DEIS by at least 20%.

To correct this problem, the DEIS forecast should separate the irrigation company secondary water use of 8450 acre-feet. If secondary water use is projected to increase in the future it should be capped at a volume commensurate with the available surface water rights that could be used for this purpose.

The LPP-DEIS should be corrected, and the Bureau of Reclamation must clarify to what extent secondary water of the irrigation companies will not be carried in the projection for the need for Lake Powell Pipeline. The cost of secondary water is generally much lower than for potable water and it is not clear how the economics of the $2 billion Lake Powell Pipeline work if 20% of the supply is sold at secondary water rates not to mention 15.4% of the supply lost to leakage." [35]

CSU found that secondary water use did not grow with the population in our past FERC comments in LPP Scoping Document 2 in 2011.[36] For example, a review of earlier UDWRe water use reports from 1998-2015 reveals that secondary use has not appreciably increased, even though the population has doubled. Table 8, from an analysis by Conserve Southwest Utah, shows estimates of secondary water use in Washington County, population, and source of information.

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35 Peter Mayer WaterDM, MEMO Review the LPP DEIS. at: https://conserveswu.org/wp-content/uploads/2020/08/Peter-Mayer-Demand-Mangement-FINAL-9-4-20.pdf

36. "Lake Powell Pipeline Coalition's Comments on Proposed Study Plan and Scoping Document 2", accession no. 20081119-5130 (November 19, 2008), pages 23-26, at: https://conserveswu.org/wp-content/uploads/2012/04/scoping-2-comments-final.pdf.

Table 8. Estimates of secondary water use and population in Washington County, 1998-2015.			
Year	**Secondary Water Use (AFY)**	**Population**	**Reference**
1998	Residential 4,510+ Commercial 1593.1+ Institutional 4483= Total 10,587	78,800	Boyle Engineering Corporation, "Water Supply Needs for Washington and Kane Counties & Lake Powell Pipeline Study", 1998. [37]
2005	7,445.5	127,090	Division of Water Resources, "Municipal and Industrial Water Supply and Uses in the Kanab Creek/Virgin River Basin," Table 16, p. 41, Table 17 p. 42 [38]
2010	8504.9		UDWRe "State of Utah Municipal and Industrial water Supply and Study Summary 2010"[39]
2015	Residential 2,750 + Commercial 1,144 + Institutional 8,450 = Total 12,346	151,360	"2015 Municipal and Industrial Water Use Data, 2020 version 3, Utah Division of Water Resources "[40]

37. Boyle Engineering Corporation, "Water Supply Needs for Washington and Kane Counties & Lake Powell Pipeline Study", p. 1, 19,21. December 1998, Table 2.2, Table 2.3, at: https://conserveswu.org/wp-content/uploads/2020/07/Boyle-report-Water-Needs-Assessment-1998.pdf.

38. Division of Water Resources, "Municipal and Industrial Water Supply and Uses in the Kanab Creek/Virgin River Basin," Table 16, p. 41, Table 17 p. 42 , at:https://conserveswu.org/wp-content/uploads/2020/07/DWR-secondary-water-supplies-2005.pdf.

39. Utah Department of Water Resources, State of Utah Municipal and Industrial Water Supply and Study Summary 2010, Table 2-24, page 135, at: https://conserveswu.org/wp-content/uploads/2020/07/DWR-MI-water-use-2010.pdf.

40. 2015 Municipal and Industrial Water Use Data. 2020 version 3, Division of Water Resources, page 147, at: https://water.utah.gov/wp-content/uploads/2020/07/2015WaterDataV3.pdf.

The 2015 secondary water data for institutions of 8,450 AFY[41] is provided by irrigation company water shares, which will not increase. It won't increase with population and, therefore, it should be deleted from the calculations of gpcd because it inflates the need for the LPP.

The Utah Division Water Resources explained the problem of not having accurate data on secondary water use in the 2011 Water Needs Assessment:

> *"4.1.4.2 Secondary Water Supplies* [pages 4-12]
>
> *"A number of irrigation companies deliver secondary water to most of the M&I systems in Washington County. While the 2005 secondary water use data published by DWRe are considered reliable due to the significant validation process followed, reliable data for previous years are not available with enough frequency to assess possible trends in use within the District or on a per capita basis. In 2005, total secondary water use by M&I systems in Washington County was about 7,450 ac-ft (DWRe 2009b)."*[42]

The State of Utah's Office of the Legislative Auditor General, completed a Performance Audit of Projections of Utah's Water Needs, May 2015, and pointed out the problem with counting secondary water from irrigation companies statewide. The Auditors report also shows the problem with the State adding on 55 gpcd as a standard for secondary water without justification throughout the State.[43] They wrote: [44]

> *"Volatility in the reported secondary water use raises doubts about the comparability of past water studies. It also raises questions about the accuracy of the report that water use has declined by 18 percent from 2000."*
>
> *"Figure 2.4 [from UDWRe] shows large fluctuations in secondary water use (shown in blue) during 2000, 2005, and 2010. It shows that the secondary*

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41. Ibid.

42. Utah Board of Water Resources, Water Needs Assessment, Draft March 2011, page 4-12, at: https://conserveswu.org/wp-content/uploads/2012/04/19DraftWaterNeedsAssessmentReport-1.pdf

43. "State of Utah Municipal and Industrial Water Supply and Use Study Summary" 2010, page xvi, of the total, 185 is potable and 55 gpcd is non-potable.

44. Office of the Legislative Auditor General, State of Utah A Performance Audit of Projections of Utah's Water Needs, May 2015, Chapter II Reliability of Water Use Data Needs to Improve, page 25 at: https://le.utah.gov/audit/15_01rpt.pdf.

water use in 2000 was 55 gpcd. This is the difference between the year 2000's total water use of 293 gpcd and the potable use of 240 gpcd. In 2005, that reported secondary water use rose to 70 gpcd. Then it declined to 55 gpcd in 2010. These swings in the reported use are explained, in part, by the use of different methods to estimate secondary water use."

The Auditor's report explained its concerns with the accuracy of accounting for secondary water statewide by referring to their Figure 2.4 in their report.[45] Figure 2 (from their Figure 3-1, Page 3-2[46]) shows how the same 55 gpcd is added to per capita use in Washington County in 2010. The per capita use is explained:

"Section 3.2.1 WCWCD 2010 Per Capita Water Use, page 3-2, 2015

"In 2010 the per capita water use in the WCWCD service area was estimated to be 325 gpcd. Figure 3-1 above shows that 270 gpcd was culinary water and 55 gpcd was secondary untreated water. Residential use contributed 156 gpcd, and commercial, institutional and industrial (CII) use contributed 169 gpcd. CII includes use from second homes." [emphasis added]

45. Ibid, page 22-23.

46. Utah Division Water Resources, Water Needs Assessment, p.3-2, 2016, at https://conserveswu.org/wp-content/uploads/2018/03/FERC-Water-Needs-ASSESSMENT-19-5-5-16-1.pdf

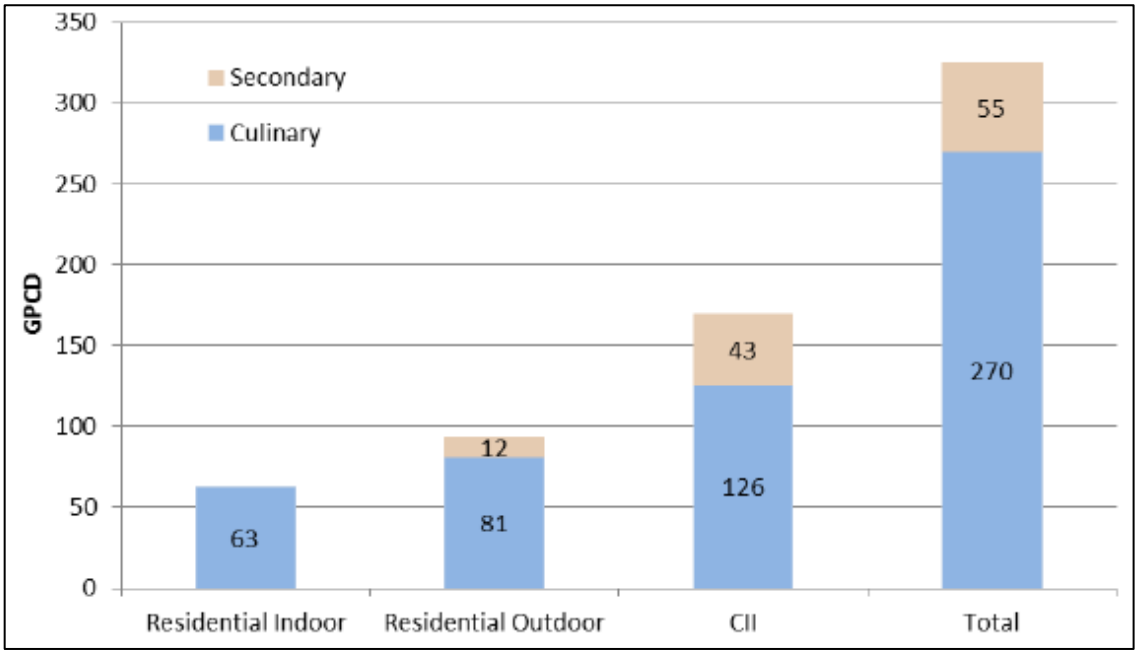

Figure 6. Secondary water added to residential in 2010 (reproduced from UDWRe Figure 3-1).

Cities reported their irrigation company water shares for their secondary use, which is why the amount of secondary water use was so similar over the years. Weber County found after they simply metered secondary water—without changing any pricing—homes used 30 percent less water.

This information indicates secondary water shares of the irrigation companies do not increase with population growth. Thus, it is not justified to add 73 gpcd of secondary use in per capita use for 50 years because it distorts the need for water. The secondary use is also seasonal and not used 365 days a year. Since the institutional water users are using the most secondary water, 8,450 AFY, and do not pay any property taxes for water, or increased water rates, or added surcharges, this puts more of the cost burden paying for the LPP's water on residents and businesses. Also, irrigation companies would not have any fees to help pay for the LPP, and again the LPP's costs fall more on the residents and businesses to pay for the LPP.

The WCWCD is using the wrong information by including the irrigation company water shares that improperly inflate the GPCD demand for the LPP.

Waterdm Concurs That Future Per Capita Use Improperly Inflated in Demand Model

Again, from WaterDM's analysis:

> *"If more than 500,000 people live in Washington County, Utah, in 2075 and use an average of 277 gpcd (including water losses), it will be one of the most water-inefficient communities in America in that year or any year. It is not reasonable to plan for such inefficiency and profligate water use.*
>
> *The future per capita use presented in the DEIS has been improperly inflated given that 30 years of potential efficiency gains are ignored, secondary water use is incorrectly included and allowed to increase, and water loss is never addressed."* [47]

CSU describes in our comments on the LPP DEIS that there is no deficit; the proponents are simply trying to increase the need for the LPP. The UDWRe allowed the WCWCD to artificially inflate Washington County's need for water to justify the need for the LPP; therefore, the decisions were based on the wrong information. The Demand Model needs to be updated with the correct information in the final Plan.

Water Loss 15.4 % Without Reduction to 2075 and 15-Year Reserve Buffer

The Plan promotes controlling water loss, but the analysis in the LPP DEIS based on UDWRe's LPP project data doesn't show any reduction to 2075. Thus, it is conflict with Plan.

The Plan does not provide evidence why the proponents' projected "system loss" of 15.4 percent will be the same annually to 2075. The Plan's timeline is set to 2070. However, UDWRe allows uses another arbitrary way to increase demand by using a 15-year "reserve buffer" and continues to use 15.4 percent "system loss" for a total of increased water demand by 30 percent. These factors appear to be the proponents' contrivances to justify the LPP. If these forecasts hold, annual water losses will be more than 24,000 AFY by 2075, which is more than the potable demands of the commercial and industrial sectors combined. Thus, these measures need to be explained in the final Plan because they inflate the input information to the Demand Model.

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47. Peter Mayer WaterDM, MEMO Review the LPP DEIS, at: https://conserveswu.org/wp-content/uploads/2020/08/Peter-Mayer-Demand-Mangement-FINAL-9-4-20.pdf

WaterDM Describes System Loss in the LPP-DEIS:

> *"In the LPP-DEIS, a 15.4% water loss factor is applied each year to account for real losses in the system. The 15.4% water loss factor, presumably based on current water loss rates, does not change over the 60-year period of the forecast and is applied to both potable and secondary water use.* ***[T]he DEIS predicts real annual water losses (e.g. the physical loss of water from the system) of more than 24,000 AF by year 2075****, which is an astonishingly high volume and more than the potable demands of the commercial and industrial sectors combined.*
>
> *"The Lake Powell Pipeline is $2 billion dollar project and the DEIS forecast states that 15.4% of the product or value delivered through this LPP will be lost each year. This implies that approximately $300 million in value of the $2 billion dollar project will be wasted over the life of the project. This is an outrageous, wasteful, and completely unreasonable assumption to foist upon water rate payers in Utah. The economic consequences of $300 million in water losses are simply too large to ignore. State and national policies are increasing accountability for water loss and requiring utilities to reduce real loss to the extent it is economically reasonable. In 2020, Utah passed HB 40 which will improve water loss accounting across the State.*[48] *This increased scrutiny of water losses will certainly apply to Washington County as well.*
>
> *"The starting point for water loss in Washington County, 15.4%, is an extremely high level of real losses for a system to endure. For many years an industry rule of thumb was that anything above 10% "unaccounted for water" constituted a real problem. Over the past 20 years water loss accounting has improved and advanced which has improved understanding of typical water loss rates, which vary tremendously depending upon the age of a water system. Properly designed and installed new distribution systems have lower levels of loss than older water systems and managing system pressure has a significant impact.*
>
> *"It is unreasonable that water loss levels for Washington County to do not improve over time in the DEIS forecast. This implies that this high level of waste and loss is both tolerable and acceptable and affordable, none of which*

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48. Utah Legislature, H.B. 40 Water Loss Accounting, 2020 General Session, at: https://le.utah.gov/~2020/bills/static/HB0040.html

is true. More properly, the DEIS forecast should show a decreasing level of water loss over time until a level below 10% is achieved. A level of 6% - 8% would not be an unreasonable target for a well-managed system with many new components based upon my experience. Maintaining a loss level of 15.4% unreasonably and unnecessarily inflates the final demand forecast by at least 5.4% - 9.4%." [49]

Price Elasticity Will Reduce GPCD Current Projections

The LPP-DEIS explained on page 245 that water use would go down by 24 percent due to price hikes so that water needs would be much lower. However, it isn't reflected in the Demand Model. Without evidence, LPP proponents assert that conservation gains achieving use below 240 gpcd cannot be considered after 2045, again perhaps to show a need for LPP. Further, the reduced demand resulting from increased water pricing will further lower use, which will make it more challenging to pay for the LPP. This is another reason CSU questions the Demand Model's logic that their water use will stay static at 240 gpcd for 30 years.

Model Inputs, page 48

As we detailed in these comments, CSU suggests that inputs into the Demand Model are flawed and need to be validated. One of the ostensible intents of the Plan is to use reliable data; thus, the supporting data should be included in the Plan. If reasonable numbers are used in the Demand Model, we may find we will not run out of water in ten years. The UDWRe has not put forth creditable assumptions, perhaps because the Plan is trying to inflate the need for the LPP.

Inflated Demand Forecasts = Costly Decisions

WaterDM also found that inflated demand leads to costly decisions. From WaterDM:

"The factors that combine to create a greatly inflated demand forecast in the DEIS are not unique. Water utilities had struggled with making accurate demand forecasts since the mid-1980s when federal plumbing codes and energy standards began reducing the water used for toilets, showers, faucets, clothes washers, dishwashers, and more."

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49. Peter Mayer WaterDM, MEMO Review the LPP DEIS, at: https://conserveswu.org/wp-content/uploads/2020/08/Peter-Mayer-Demand-Mangement-FINAL-9-4-20.pdf

An August 2020 Pacific Institute report found that California water providers consistently inflated forecasts of future demand even as they tried to incorporate the impacts of efficiency. On average, the report found water suppliers projected that per capita demand would decline by less than one percent per year; but actual per capita demand declined twice as fast.[50] The report states:

> *"Urban water suppliers routinely overestimated future water demand, projecting increases in water demand even as actual demand declined. The is largely due to inflated estimates of future per capita demand, although overestimates of population are also a contributing factor." (p.8)*

The consequences of an unrealistic and inflated demand forecast can be significant and can impact a community for years to come. The report states:

> *"Overestimates of future water demands have important implications for local communities and the State. Specifically, they can result in unneeded water supply and treatment infrastructure, higher costs to ratepayers, and unnecessary adverse environmental impacts." (p.8)*

The consequences of the inflated water demand in the DEIS include all of the problems noted by the Pacific Institute such as over-sized expensive infrastructure, higher costs to rate payers, and unnecessary environmental impacts. Even if the Lake Powell Pipeline is constructed and the full population forecast appears, future per capita use is likely to be substantially lower than forecast in the DEIS. An unrealistic population forecast, and unreasonably high levels of water loss compound the problem and further inflate demands to unrealistic levels compared with communities across the western US."

Conclusions on Demand Forecasting in the Plan

The analysis in this report clearly illustrates how the DEIS water demand forecast for Washington County has been grossly inflated. The forecast is inflated through multiple mechanisms including:

- A population forecast that increases by 293%.

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50. An Assessment of Urban Water Demand Forecasts in California. August 2020. Pacific Institute. Oakland, CA., at: https://pacinst.org/wp-content/uploads/2020/08/Pacific-Institute-Assessment-Urban-Water-Demand-Forecasts-in-CA-Aug-2020.pdf

- An excessive level of per capita water use that would make Washington County water users among the highest in the US, even after more than 50 years of available efficiency improvements.
- Improper inclusion and inflation of raw secondary irrigation water in the forecast.
- A 15.4% water loss factor that never improves and thus wastes approximately $300 million in value of the $2 billion dollar project.

A statement of need and water demand forecast for a project of this size and scope must be based on sound data, reasonable assumptions, and conservative resource principles to ensure the water will not be wasted. Water customers across the Western United States have successfully implemented effective water efficiency that today reduced per capita use far below levels shown the Plan's forecasts for 2020 and 2075. The forecast in the Plan provides for an excessive level of per capita water use over the next 55 years with efficiency improvements that simply end at year 2045 with no further improvement in efficiency achieved over the next 30 years. This is neither realistic nor reasonable."

The DEIS forecasted a future population of more than 500,000 people, which is equivalent to a city the size of Tucson, Arizona, or Albuquerque, New Mexico. With this level of development, even spread across Washington County with its rural setting, current housing patterns will necessarily change, and fewer people are likely to live in large sprawling single-family homes with a supply of secondary water for irrigation, as is common today. Under this high growth scenario coupled with escalating costs for water, demand will necessarily change and become more efficient. The DEIS forecast should reflect realistic efficient levels of future use, not wasteful and excessive levels as currently presented."[51]

We Are Not Running Out of Water in 10 Years!

A Virgin River hydrological model used in the LPP DEIS did not include all the water the WCWCD diverts to its reservoirs and its aquifer project every year during higher flows in March, April, and May—the reservoirs fill most years. The DEIS notes on page 10, 1.5.2. Virgin River, that:

> *"The Virgin River gage in Virgin, Utah is located upstream from any major diversions. The long-term mean annual streamflow at this gage is 182 CFS.*

51. Peter Mayer WaterDM, MEMO Review the LPP DEIS, at at: https://conserveswu.org/wp-content/uploads/2020/08/Peter-Mayer-Demand-Mangement-FINAL-9-4-20.pdf

Annual streamflow is usually greater than 100 CFS and in high water, years can exceed 300 to 400 CFS."

In other reports,[52] UDWRe claims a much higher amount of more than 113,000 AFY of Virgin River water use by 2060. This amount of water would fill the shortage that the WCWCD claims.

This information shows there is a lot more water the WCWCD could divert, so there may be no future shortage. The problem with the assumption in the Plan and the DEIS that the WCWCD has to get water from the Colorado River is faulty because it could divert more spring runoff to the reservoirs.

Another option to fill the shortage not considered can be found in the 2010 Maddaus study[53] that projected a list of conservation programs could save up to 57,000 AFY and only cost $88,000,000.

The Plan's analysis is deficient because it leaves out this information. CSU suspects that since the WCWCD only accounts for such a small amount from their existing reservoirs and aquifer their existing infrastructure, they could yield more water.

In addition, the Plan touts conservation goals that are meager, at best. Figure 5 reproduces Figure 4-3 on page 55 of the Water Resources Plan 2021. The line for the scenario of achieving Regional Conservation Goals (RCG) was based on one of the least aggressive conservation targets in the state.

CSU recommends:

1. Hire a third party to evaluate WCWCD projects for their efficiency to increase water yield from the existing meager yield of the reservoirs and aquifer.
2. Create a holistic, integrated approach to water management and conservation that considers all the water supplies in Washington County.

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52. Utah Division Water Resources, "Utah's Perspective: The Colorado River", page 8, at: https://water.utah.gov/wp-content/uploads/2019/01/TheColoradoRiverart.pdf.

53. Maddaus Water Management Inc, " Overview of Maddaus Resource Management's Water Conservation Technical Analysis Memorandum, at: https://conserveswu.org/wp-content/uploads/2020/05/Maddaus-report-2010-1.pdf.

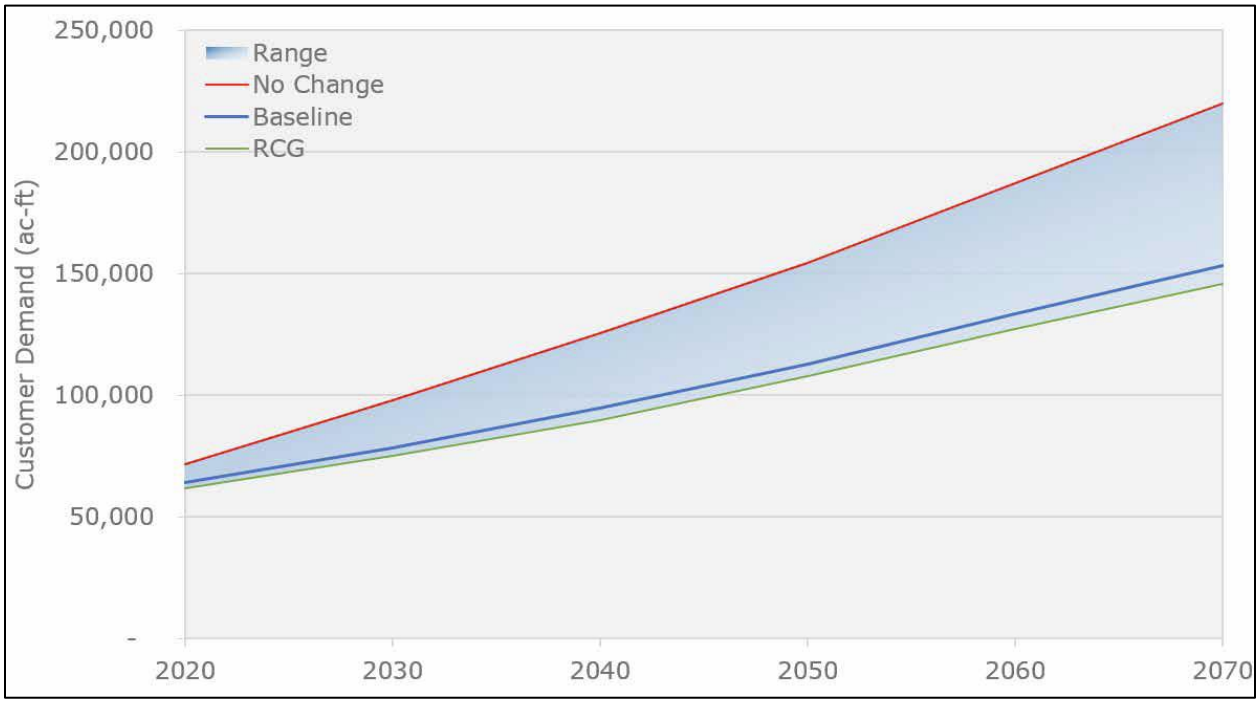

Figure 7. Projected Customer Demand for Kanab/Virgin River Basin, from Figure 4-3 on page 55 of the Water Resources Plan 2021.

UDWRe attempts to explain its reasoning for such a low conservation goal of 240 GPCD by 2060.

> *"In 2019, UDWRe published the Regional Conservation Plan in 2019 that provided conservation goals for each region in Utah (UDWRe 2019b). In that plan, the 2015 baseline water use rate for Washington County was approximately 302 gallons gpcd and approximately 358 gpcd for Kane County. The 2065 conservation goal for Washington County was 236 gpcd. WCWCD's 12 conservation goal of 20 percent by 2060, or 240 gpcd, is in line with the regional goal and is used in this purpose and need report."*

If UDWRe corrects the Demand Model and doesn't inflate the input values, we would have enough water to grow to 2075 and surpass the Kanab/Virgin Regional Conservation (RCG) Goal of 146,000 AFY (Plan p.52).

Chapter 5 Water Conservation

UDWRe's Plan for Water Management Insufficient

The Plan uses the term "water management," but does not define it. Our definition is: "the programmatic management of water supply and demand such that demand is kept safely within verified supply.

The purpose of the plan in the state's water management process is not described. What inputs were used to create it, how were they used, what downstream water management processes are expected to use it, and how? What authorities are defined for implementing the plan? Creating a plan without this context is not meaningful.

The "three principles of water management" as described in the plan do not appear to have a reference in water management literature. What is their basis? These principles seem to reflect an incorrect or invalid focus, with no mention of the key requirements of water management (verified projected water supply, keeping demand safely within the projected supply): (1) Reliable Data is needed to make informed water management decisions; (2) Obtaining a Secure Supply of water to meet future needs requires a comprehensive approach; and (3) Healthy Watersheds are necessary to ensure the viability of the state's precious water resources. The Plan seems to be "supply-focused", giving very light treatment to demand management, and giving no treatment to verification of supply.

CSU requests a response to the issues identified in CSU's Comments on the Regional Water Conservation Goals (submitted March 2019; DWRe committed to respond but never has) and CSU's analysis of Utah's share of the Colorado River (Salt Lake Tribune op-ed and the analysis referenced in it, July 2021). CSU is impressed with the steps UDWRe is taking on water conservation measures statewide. The challenge to how to implement and enforce the measures.

On Water Conservation (LPP DEIS 5.1 page 10)

> *"The WCWCD and its municipal partners have invested over $60 million in recent conservation efforts."*

WCWCD claims that any project they build is a "water conservation project." These include pipelines and other capital projects that transport water, totaling $60 million to date. However, WCWCD has invested very little in the active practices that change users' behavior, resulting in significant conservation. CSU understands that WCWCD is a wholesaler of water and builds water projects. However, WCWCD must provide leadership for cities and require that their water

contracts implement water conservation programs listed in the Maddaus studies (described below).[54]

WCWCD's Claim of Saving 30 Percent Water Use is a Data Error

In the LPP-DEIS, Washington County is lauded for reducing GPCD by 30 percent since 2000. Still, it expects it will take until 2045 to achieve only modest further reductions (to 240 GPCD) and expects no improvement after that, which is a wrong assumption and lacks any credibility.

Water agencies in Washington County have not focused on implementing active water conservation. The gains made in water demand (reduction from ~ 400 gpcd in 2000 to ~296 gpcd in 2020) can largely be attributed to an over-estimation of past unmetered secondary water overuse. Other reasons for a lower GPCD include passive methods such as higher density residential development (reduced lot sizes), resulting in a less landscaped area and less outdoor water use), improved plumbing practices (efficient fixtures and appliances), and education.

Saving 1% Per Year Provides Enough Water for Growth to 2075

According to Western Resource Advocates (WRA), a 1 percent decline per year in water use is reasonable and explained in detail below. In 2015, Washington County used 302 GPCD; by reducing demand by just 1 percent each year, we could eliminate the need for 86,000 acre-feet of additional water from the LPP by 2060, even using UDWRe's population projections.

Summary of the 1 Percent Conservation Alternative From the 2013 LWA[55]

> *"In summary, the 1 percent water conservation alternative is a feasible and responsible solution to the water management issues facing Washington County. If implemented, it would result in total demand of 115,000 AFY in 2060, with a system-wide water use rate of 176 gallons per capita per day, similar to other communities' water use rates today.*[56] *This section presents an*

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54. Maddaus Water Management, Final Draft Technical Memorandum: Water Conservation Technical Analysis, August 30, 2010, at: https://www.wcwcd.org/wp-content/themes/wcwcd/pdf/maddaus-water-management-water-conservation-technical-analysis-report-2010.pdf

55.: Western Resource Advocates, "The Local Waters Alternative to the Lake Powell Pipeline", 2013, p. 23, at: https://westernresourceadvocates.org/publications/the-local-waters-alternative/

56. Western Resource Advocates. 2003. Smart Water: A Comparative Study of Urban Water Use Efficiency, at: https://www.waterboards.ca.gov/waterrights/water_issues/programs/hearings/cachuma/comments_rdeir/pacific_institute/4otherreports/wra_ch3smartwater2003.pdf

analysis of future supplies for Washington County and includes both reuse (recycled) water and agricultural-urban water transfers. The reuse volume reflects the lower level of water use under the 1 percent conservation scenario. And, water supplies made available from agriculture lands is predicted to be greater than what was predicted in Draft Study Report 19. These future supplies, along with water conservation, can be phased in overtime as needed, thereby providing water managers with options that are more flexible than the Lake Powell Pipeline. This is especially important given the uncertain economic development and population growth (as underscored by the recent significant shift in GOPB population projections). Thus, pursuing additional water supplies in an incremental, diversified approach is preferable to relying on a single, large project that may unduly commit residents to high repayment obligations."

WRA noted that the USGS has documented a national trend of declining per capita water use in the municipal sector since 2005.[57] WRA also submitted in the 2018 FERC filing an Appendix. Municipal Deliveries of Colorado River Basin Water by Pacific Institute.[58]

"This report documented 100 cities and water agencies in the Colorado River Basin, finding that the majority of people receiving water from the Colorado River basins live in an area where per capita deliveries dropped an average of a least one percent per year from 1990 to 2008. Some of the water agencies that achieved per capita declines of 1 percent or more per year are located in Utah, namely Salt Lake City, Provo. West Jordon, Orem. Springville and Pleasant Grove, indicating that this is a trend, are not unique to other states. Therefore, the minimal reductions to per capita water use proposed by UBWR are unrealistic and unreasonable."[59]

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57. USGS Summary of Estimated Water in the US 2015 at: https://pubs.usgs.gov/circ/1441/circ1441.pdf

58. Cohen, M., "Municipal Deliveries of Colorado River Basin Water", Pacific Institute, June 2011, at: https://pacinst.org/publication/municipal-deliveries-of-colorado-river-basin-water-new-report-examines-100-cities-and-agencies/.

59. Western Resource Advocates, "Comments on the Preliminary Licensing Proposal for the Lake Powell Pipeline, Project No. P-12966-001", November 16, 2018, page 12, at: https://conserveswu.org/wp-content/uploads/2020/06/WRA-Locals-Water-Alternative-updated-2018.pdf.

Utah's Water Conservation Planning

> *"The Water Conservation Plan Act (Act) (Utah Code 73-10-32) was enacted in 1998. The Act requires culinary water providers with 500+ connections and smaller systems that seek funding from the State to prepare a water conservation plan and submit it to the Division every five years."*
>
> *"By statute, the plan "shall contain a clearly stated overall water use reduction goal and an implementation plan for each of the water conservation measures it chooses to use, including a timeline for action and an evaluation process to measure progress." The Division also requests each water system to describe its pricing structure, reliable water supply, and future demand in its water conservation plan. The Act applies to approximately 175 water systems throughout the State.*

However, most cities don't implement the provisions of the Act, and there is no enforcement. UDWRe should strengthen the Act in new legislation.

Better Water Conservation Planning to Lower Demand

CSU suggests the State should consider using industry-standard planning and management processes to develop executable and accountable water conservation plans regarding objectives, tasks, schedules, responsibilities, and budget. Existing documents following current UDWRe guidance do not continue these essential elements and therefore are neither executable nor accountable. They will not result in significant water conservation but rather contain background information on infrastructure, current usage, and measures that could be taken. Conservation goals should be tied to estimates of future water supplies and what has been achieved elsewhere. Methods to reduce usage should be studied and ranked and then incrementally implemented in projects planned to move us toward the goal in measurable steps while balancing demand and supply.

CSU participated in a 2017 Governor Herbert's water strategy team to develop recommendations for a 50-year water strategy (Strategy). For many years water managers from around the state participated. More recommendations should be carried forward into this Water Resources Plan and not be forgotten. Here are a few recommendations that the State should consider adding to the Plan from the Recommended State Water Strategy July 2017. [60] They include:

Page 14:

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60. Envision Utah, " Utah Water Strategy", at: https://envisionutah.org/utah-water-strategy-project

Recommendations:

1. Prioritize the efficient and sustainable use of water as a critical strategy for meeting Utah's water needs.

2. Establish and utilize clear standards for water use measurement, tracking, and reporting

Page 6:

"10.4. Encourage cooperative interagency water decision making within and between Utah's Departments of Natural Resources, Environmental Quality, and Agriculture and Food, and with states that share watersheds with Utah."

"10.5. Accelerate funding for adjudication of water rights in order to provide greater certainty and marketability of rights. 10.6. Provide adequate ongoing funding and staff for technical work and intergovernmental cooperation needed to quantify and settle Federal Reserved Water Rights claims. 10.7. Enhance legislative and public support for ongoing funding to meet Utah's water-related needs."

Page 18:

1.2. Establish and utilize clear standards for water use measurement, tracking, and reporting. Utah needs to establish the foundation for a more accurate and reliable water use and supply data gathering and reporting system. Clear standards and targets for measuring, tracking, and reporting water use should be set so they can be used consistently by water providers, communities, and the State. These standards and targets should describe how different water uses are to be metered and measured, identify best technologies and practices for measuring devices, and specify reporting requirements in units and time periods of measurement.

UDWRe doesn't have to reinvent the wheel; it can look to other states to see agencies' new water management ideas of working together. For Example, The Denver One Water Plan:

"The partnership between the City and County of Denver, Denver Water, Mile High Flood District, Metro Wastewater Reclamation District, Greenway Foundation and the Colorado Water Conservation Board will break down the historical silos between drinking water, wastewater, stormwater and other water uses to cooperatively manage the entire water cycle. Through enhanced collaboration and predictable land use and

development policies, Denver's One Water Plan will promote healthy watersheds in an equitable, economically, and environmentally beneficial manner."[61]

Page 22:

> *"1.7. Provide adequate funding and investments for effective water efficiency and conservation. Funding and investments are needed to fully realize the potential contributions and return on investment that water efficiency and conservation efforts can make to providing for Utah's water future. Water agencies should budget for water conservation programs in a manner similar to the way they budget to develop new water supplies. Funding for conservation measures also should be made available on an ongoing basis. Investments should be made in water demand management infrastructure to measure, track, report, and implement efficiency standards. Needed resources also include agency staffing and budgeting to better integrate conservation into water systems, enhance ongoing interactions with the public, deliver conservation programs, and conduct research and evaluation. Many different state, regional, and local entities can help promote water conservation, so funding and resources from multiple sources need to be allocated to these efforts. Ongoing and sufficient support for water efficiency and conservation should be prioritized and forthcoming to make these efforts effective at contributing to Utah's water future."*

Water Management Costs VS LPP Costs

The LPP is more expensive than conventional conservation methods and will require an investment upfront. At an *estimated* $1-2 billion development cost, the cost nearly triples when adding interest over the 50-year payback period, even at low-interest rates secured by state bonds. And these costs are likely to be much higher. For example, the planned but recently judicially rejected Snake Valley Pipeline in Nevada began with a cost of approximately $6.4B. A review of the project with interest costs pushed it to $15 billion.[62] If similar economics apply to the LPP, the costs could easily surpass $4-5 billion.

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61. Denver One Water Plan, at: https://denvergov.org/Government/Agencies-Departments-Offices/Department-of-Transportation-and-Infrastructure/Programs-Services/One-Water

62. Southern Nevada Water Authority, "Ability to Finance Report to the Southern Nevada Water Authority", June 2011, at: http://www.riversimulator.org/Resources/Pipelines/LVP/SNWAsAbilityToFinanceExh383HobbsBonowReport.pdf

In contrast, water conservation and management costs are well known and incremental, occurring gradually as required, avoiding the need for large capital projects. Implementing a conservation water use rate structure is very inexpensive for the retailer and can reduce demand by almost fifty percent without compromising community attractiveness and quality of life. Indeed, the greatest negative impacts are only to those who are not conservation minded. Even those impacts can be short-term in nature if the users adapt their behavior. Impact fees could be lowered to help offset Localscapes[63] installations for all new development. A portion of impact fees could help those wishing to convert. New developments should be plumbed for outdoor irrigation using secondary or reuse water instead of culinary water for landscaping. (As noted in a previous section, approximately 70 GPCD of culinary water is currently used for outdoor landscaping.)

Less Costly: Effective Conservation Methods

There have been many studies of various methods of water conservation, their costs and yields. The WCWCD held back the earlier 2010 Maddaus report that showed substantial water conservation potential:

- Analyses in a report contracted by UDWRe, the 2010 Maddaus Study,[64] included a Program C that saved 57,000 AF at a cost of $83,000,000. The 2010 full report[65], on page 33, listed 54,000 AF of saving by 2060.
- Another Maddaus Study in 2018[66] compared all of the earlier Maddaus studies and exposes the 2015 Maddaus Study as flawed because of the projected water use upon which it's based: 317gpcd in 2060 without conservation, more than our current 303 gpcd. Maddaus concluded the best we could achieve with conservation is 282 gpcd.

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63. Localscapes, at: https://localscapes.com/

64. CSU, notes on Maddaus Water Management Final Technical Memorandum: Water Conservation Technical Analysis, August 30, 2010, at: https://conserveswu.org/maddaus-report-on-cost-of-conservation-2010/.

65. Maddaus Water Management, Final Draft Technical Memorandum: Water Conservation Technical Analysis, August 30, 2010, at: https://www.wcwcd.org/wp-content/themes/wcwcd/pdf/maddaus-water-management-water-conservation-technical-analysis-report-2010.pdf.

66. WCWCD, Water Conservation Programs: A Comparative Evaluation, republication of Maddaus study, 2018, at: https://conserveswu.org/wp-content/uploads/Maddaus-Water-Conservation-Program-Comparison-2018.pdf.

- Utah Regional Water Conservation Goals.[67] The state estimates in their 2019 regional goals document that our region's conservation water usage goal for 2065 should be 237 GPCD with a demand of 131,202 acre-feet for a population of 500,000. As explained elsewhere in these comments, balancing supply and demand is very achievable without building the LPP. Washington County can do better using less water, as shown in other desert communities.
- A study of *Integrating Water Efficiency into Land Use Planning in West*[68] by WRA has examples of a proper conservation plan, zoning, costs, and other important planning tools.

The most apparent high yield, low-cost methods to reduce water demand that can be implemented incrementally appear to be:

- Significantly tiered water rate structures.
- Conservation-minded building codes limiting grass and promoting native desert landscaping.
- Water budgeting.[69]
- Just-in-Time education and help (as new methods are implemented).

Chapter 6 – Future

The Reasons for our High Use/Demand

There are various reasons for the high water use in Washington County, including our area's culture, awareness, and lack of water conservation price signals. The cultural aspect is the most difficult to understand. It could include the fact that many residents come from areas with more abundant water where expansive lawns are normal or historic difficulty storing water (including catastrophic dam failures). The awareness aspect is easier to understand. Generally, despite the efforts of water departments, there is very little awareness that water is precious and should be conserved. We live in a desert, with many cues (desert ecosystems, low rainfall, hot summers), but there are few official signals that we should conserve water:

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67. UDWRe, Regional Water Conservation Goals Report Final, 2019, at: https://conservewater.utah.gov/regional-water-conservation-goals/

68. WRA, "Integrating Water Efficiency Into Land Use Planning in the Interior West: A Guidebook for Local Planners, June 2019, at: https://westernresourceadvocates.org/publications/integrating-water-efficiency-into-land-use-planning/.

69. Conserve Southwest Utah on water budgets, at https://conserveswu.org/water-conservation/.

- Institutions (schools, churches, golf courses) and businesses are generally not landscaped in arid vegetation. Institutions and cities are the largest water users, and this should be a focus area of the Plan. However, the residents have to pay for new projects, and these entities don't pay property taxes on water, while the residents do.
- Regulations such as enforcement, landscape ordinances, or requirements on water use or penalties for wasting water are largely missing.
- Communications about the need for conservation are indirect and infrequent.
- Little comparative data given to customers on their water use relative to goals and other customers are missing.

However, the biggest reason is that there is no quantitative economic signal for our water departments that water has a unique value. Utah has some of the cheapest water rates in the country, and Washington County has some of the cheapest in Utah, despite being one of the driest counties in one of the driest states. A commodity that is priced as if it has no value is treated as if it has no value. We purposefully even hide the real cost of water by including a significant line item in our property taxes for water, making about half of our water price not dependent on how much we use. Utah is one of the few states with this practice. Indeed, it is against normal business practices, where infrastructure improvements must be funded from the normal revenue stream. On top of this issue is that water pricing is largely disconnected from usage; our county's water rates are so low with such small price tiering that it makes no difference how much a normal home or business uses. The step increases in the rate structure are so shallow that it sends no conservation signal. There is overwhelming data that pricing is the most influential factor in water use. Water budgeting[70] is a cheap, fair, and highly successful way to reduce water use dramatically. The budgeted rates are structured to support the water district's revenue requirements.

Reuse

In the LPP DEIS, the BOR claimed the projected 16,000 AFY of water reuse by 2060 in the 2013 Local Waters Alternative to the LPP was too high. Although if the community's population grows to 500,000 people, there will undoubtedly be more water than the proponents' low projections of 7,300 AFY. Therefore, the 16,000 AFY reuse in the LWA by 2060 is reasonable and should not be a reason to eliminate the LWA as an alternative.

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70. See analysis at: http://conserveswu.org/programs/water-conservation/.

When, in 2006, the Utah Legislature passed the Lake Powell Pipeline Development Act, it also passed the Wastewater Reuse Act.[71] The Legislature had officially authorized reuse in 1995.[72] A May 2018 reuse presentation[73] to the governor's Executive Water Finance Board (EWFB) showed that twelve reuse projects were filed in eleven years under the 1995 version of the law. However, after the repeal of the Wastewater Reuse Act in 2006, only seven reuse projects had been filed in twelve years.

The mayor of South Jordan, Utah, also presented to the EWFB regarding her city's reuse project.[74] It was designed like a reuse facility in Altamont, Florida,[75, 76] that does not use reverse osmosis, and the costs are half of reverse osmosis.

Utah's Colorado River Water Rights are in disarray.

After CSU reviewed Utah's Colorado River water rights, it seems that Utah has over-promised water to communities across the State in the Colorado River Upper Basin, water that is no longer in the system. People own property worth millions of dollars, thinking they have water, and there may not be any physical water for them to use.

In a 2014 Deseret News article, Utah's water managers explain the over-allocation of its water: [77]

> *"The Water Question: The staggering problem of determining water rights.*

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71. Utah State Legislature, Wastewater Reuse Act, 73-3c-101, 2006, at: https://le.utah.gov/xcode/Title73/Chapter3C/C73-3c_1800010118000101.pdf.

72. Utah State Legislature, Utah Business Trust Registration Act, 16-15-101, 1995, at: https://le.utah.gov/xcode/Title16/Chapter15/C16-15_1800010118000101.pdf

73. Hartvigsen, D., "Why aren't we reusing more water?", Smith Hartvigsen, PLLC, at: https://www.utah.gov/pmn/files/399003.pdf

74. South Jordan City, "Overview of South Jordan Water Conservation Program & DPR Demonstration Project", 2019, at: https://www.utah.gov/pmn/files/505541.pdf

75. Altamonte Springs City, Florida, city website, at: https://www.altamonte.org/754/pureALTA

76. Florida Potable Reuse Commission, "Framework for the Implementation of Potable Reuse in Florida, January 2020, at: http://www.watereuseflorida.com/wp-content/uploads/Framework-for-Potable-Reuse-in-Florida-FINAL-January-2020-web10495.pdf

77. See at:http://www.deseretnews.com/article/865617715/The-water-question-The-staggering-problem-of-determining-water-rights.html; 2014 by Amy Joi O'Donoghue.

"'Your paper water right may look very big and supply everything you are asking, but the wet water, in reality, can be very different,' Kent Jones, the state engineer over water rights, said:

"'The Colorado River, for example, holds 1.4 million acre-feet of water for Utah to put to use. There are applications approved for more than 2 million acre-feet, and about one half of that is currently in use.' Jones said the imbalance has yet to be a problem because the water has not been developed — but the struggle will come with time, and those holding 'junior' rights will go wanting.

"Many of the files are outdated, which means there could be a big difference between what is in the file — paper water — and the actual water that exists or is available — wet water.

"'We are growing so much as a state and there is so much demand for water, it is critical we know where these existing uses are and protect them,' said Mike Styler, executive director of the Utah Department of Natural Resources. 'And there is really no new water to be had.'

"Why should Utahns care? Because the nature of water rights is that there <u>are far more rights than the water that actually exists,</u> so the task is to determine what is real and what is not. [emphasis added]

"Of the 15 major watershed areas in Utah, just two of them have been researched and adjudicated, which means that the investigation and documentation work was carried out and a judge then issued a decree."

In 2019, the State's Upper Basin Water Rights website showed 2.5 MAFY of approved depletions. But even at flows over 16.4 mafy, the Upper Colorado River Basin Compact only allows Utah to deplete 1.4 MAFY:[78]

- "6,450,413 acre feet diversion; and
- "2,542,092 acre feet depletions"

"Water rights can be quantified through both diversion and depletion volumes of water, in acre feet per year (AFY). A water right is permitted to 'divert' a specific amount of water, a portion of which will be returned to the river

78. See at: https://www.waterrights.utah.gov/distinfo/colorado/WRPriorityDDview.asp

depending on its use (i.e., through agricultural return flows or municipal wastewater treatment plants). The portion of the right that is consumptively used (mostly through plant evapotranspiration) is considered 'depleted' from the basin. A depletion is defined as the part of the water that will not return to the river system. It is the amount of water that is lost from the hydrologic system based on the associated beneficial use. It is evaporated, transpired, incorporated into products or crops, and consumed by humans or livestock."

Consequently, there are significantly more approved water rights applications, which, if developed, could potentially exceed Utah's entitlement.[79] All of the authorized city water rights holders should be made aware of this over-allocation to implement water conservation measures to protect their water supply for the future.

Further, in 2008 Utah passed a law (Utah Code 73-3-12) to accommodate the LPP water right that allows water agencies 50 years to prove up on their water rights and show beneficial use. This was supposed to create some security for cities that they would get water in the future. But this is a false promise due to Utah over-allocating its share of the Upper Colorado River Basin. As water supplies decline, it is unclear who will be able to use the water for the long term.

Staff from the State's water agencies said one could not rely on water rights listed on this web page to determine depletions because they are not accurate. Some of these water rights were never developed. They said the staff of the River Basin Planning Section Manager at UDWRe would have a more accurate list of depletions because the depletions must be reported to BOR.

However, when asked, UDWRe staff provided CSU with an outdated depletion list using a water budget model.[80] CSU asked for a more specific list of what data was used for this chart to cross-check the water-right holder-approved applications. However, a detailed and current list was never provided. The outdated depletions estimated in Figure 4 in 2005 show a significant amount of water not included in the list of categories. A staff member said a reason for the over-allocation of rivers and streams was not knowing how much water a stream produced, and the State wanted to make sure they captured it all.

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79. Water Right Issues in the Upper Colorado River Basin of Utah, at: https://www.waterrights.utah.gov/meetinfo/m042005/summary.htm

80. See at: http://conserveswu.org/wp-content/uploads/Upper-Basin-DEPLETIONS-2014_Colorado_River_Compact.xls.pdf

For instance, Bob Fotheringham, a retired Cache County Water Manager, wrote in an article for the State Water Strategy Team, Your Water Your Future that:

> *"…based on the records of the State Engineer, we may be up to 6 times over-appropriated to facilitate the full beneficial use of our water resources."*

Further, a local water official stated that there are significantly more approved water rights applications, which, if developed, could exceed Utah's Compact entitlement.[81]

We asked for proof that Utah has water rights left to use for the LPP for about three years. We formally requested UDWRe and UDWRi to no avail. It is troubling after 14 years of study and studies costing $40 million, and we still can't get that information.

In 2018, Conserve Southwest Utah submitted a formal Government Records Access and Management Act (GRAMA) records request to review the water rights that Utah is using of its 1.369 MAF Upper Basin allocation, and the State failed to respond. This puts in doubt the claim that Utah has enough water in its allocation for the LPP to exchange it with BOR. We suspect Utah does not have this large amount of unused high water to trade. The lack of transparency is concerning.

In 2018, CSU submitted another GRAMA request to the UDWRe to request the specific water rights they are exchanging for the LPP. Their response thus far is that the records from the UDWRe and the Division of Water Rights (UDWRi) do not agree with each other.

CSU could not get the current information from the UDWRe or the UDWRi; therefore, we gathered information on depletions. We found a UDWRi's PowerPoint presentation online, the contents of which are reproduced below.[82]

Utah claims it is using 1,007,500 AFY according to UDWRi, but the State uses a "*Water Budget"* model to come up with these numbers. Conserve Southwest Utah found in its preliminary research of the depletions that much more water is used in these categories today, not yet identified as water use in this PowerPoint slide 2 below. Therefore, that doesn't leave enough water for the LPP.

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81. Water Right Issues in the Upper Colorado River Basin of Utah: https://www.waterrights.utah.gov/meetinfo/m042005/summary.htm

82. Utah Division of Water Rights, "Upper Colorado River Basin Current Water Rights Issues", April 2005, at https://www.waterrights.utah.gov/meetinfo/m042005/jdo_2005.ppt.

Figure 7, reproduced from a Utah Division Water Resources (UDWRe) presentation, shows proposed uses for Utah's remaining share of the Colorado River and shows Utah assumes it has 361,000 AFY of water from Colorado River Compact water left to develop, based on a flow of 15 mafy at Lee Ferry. However, if lower flows of below 15 MAFY are used in the analysis, Utah's compact rights are reduced, eliminating water availability for the LPP. UDWRi's PowerPoint slides below show:

1. The slides show Utah's current Depletions. From CSU's research, we are using a lot more water is being used than the slide reveals.
2. They don't account for water use on federal lands or BLM lands.
3. The third slide shows 493,100 afy, which is an over-allocation, more than the 361,000 AF that agencies say they have left to use.

Another example of over-allocation of Utah's remaining Colorado River share of 361,000 AFY is illustrated in UDWRi 2005 PowerPoint slide:[83] These water districts should be aware of the over-allocation to implement water conservation measures now because they may not be getting these approved applications for water.

Since we haven't been able to get a detailed accounting for currently used water rights, it is questionable whether the UDWRi has water left for the LPP. We suspect that UDWRi doesn't have any physical water left to use due to reduced flows. It is troubling that after 14 years of study and $40 million spent, the state is apparently not capable of proving it has the physical water rights suitable for a permanent water project that the state and its residents have to pay $ billions for.

UDWRe should disclose the water rights it uses, its depletions, and what physical water they plan to use for the LPP.

Conclusions

CSU wants to see Utah succeed in managing its water resources and we suggest a holistic, integrated approach to water management. The Plan includes encouraging steps forward on water conservation measures. However, this draft Plan lacks a way forward toward this 50-year vision, ignoring the realities that Utah will have to use less water from the Colorado River and

83. Ibid.

not more. The Plan misses an opportunity to tell stakeholders that they must take water efficiency and conservation much more seriously because it is in our economic interest.

We understand that Utah has a legal right to water from the Colorado River, but so do 40 million others in the Colorado River watershed. Utah assumes its water right is about 1.4 mafy if you use 15 mafy at Lee Ferry. But the Colorado River is no longer flowing that high; it is more likely flowing at 12-13 mafy and projected to go lower in the future. Further, Utah water right is not fixed; it is 23% of the remaining water after senior water rights holders get their water. Utah's LPP water right is a junior water right. The key question is whether Utah has water for a permanent water project like the LPP. In our research, Utah doesn't have a senior right to the remaining physical water. We suggest that Utah not keep pursuing the LPP until an independent party does the due diligence on the LPP water right.

Another of our concerns is that Utah needs a compact with Nevada and Arizona on using the Virgin River. Utah must negotiate an agreement for depletions for the LPP water where that water will be used in the lower basin but will be accounted for in the upper basin.

These larger issues that have yet to be resolved in the 50 period are not even in the Plan. It has taken 20 years to do this new State Water Plan, and we feel these issues must be addressed in this Plan.

Our intent is to make the 50-year Plan ,more robust and more sustainable. Please don't hesitate to contact us if we can answer any questions on our comments.