

# The Reliability of the Colorado River for the Lake Powell Pipeline

Climate change and prolonged periods of drought are affecting the Colorado River. The National Oceanic and Atmospheric Administration declared 2018 as the driest year on record for the state of Utah. Despite these conditions, studies by the Bureau of Reclamation (BOR) and others indicate that the Colorado River is a reliable source of water for the Lake Powell Pipeline (LPP).

The LPP is a water infrastructure project that would transport Colorado River water from Lake Powell through an underground pipeline to Washington County in southwest Utah. When operating at full capacity, the LPP would deliver up to 86,249 acre feet of the State of Utah's water allocation under the Colorado River Compact.

## The Colorado River Compact

The 1922 Colorado River Compact defined the upper and lower basins and apportioned, for beneficial consumptive use, 7.5 million acre feet (maf) to each basin annually. The compact also provided that the states in the upper basin "will not cause the flow of the river at Lee Ferry to be depleted below an aggregate of 75,000,000 acre feet for any period of ten consecutive years...."

In 1928, the Boulder Canyon Act apportioned the lower basin's 7.5 million acre feet among the states of Arizona (2.8 maf), California (4.4 maf) and Nevada (0.3 maf) and authorized the Secretary of the Interior to function as the sole

contracting authority for Colorado River water use in the lower basin.<sup>1</sup>

The 1948 Upper Colorado River Basin Compact created the Upper Colorado River Commission and allocated the upper basin's 7.5 maf to Colorado (51.75%), New Mexico (11.25%), Utah (23%) and Wyoming (14%). The portion of Arizona that lies within the Upper Colorado River Basin was allocated 50,000 acre feet annually.

The various compacts, laws and acts that govern the management and operation of the Colorado River system are collectively known as the Law of the River.

## Colorado River Storage & Management

The Colorado River storage system includes numerous reservoirs, including the two largest reservoirs in the country, lakes Mead and Powell. Lake Mead was constructed mostly for the benefit of the lower basin states while Lake Powell was constructed mostly for the benefit of the upper basin states. In the case of Lake Powell, the BOR operates the reservoir in

close coordination with the upper basin states and the Upper Colorado River Commission.

Lakes Mead and Powell work in tandem and provide most of the storage capacity in the river basin. They were built to serve as a savings account, banking water in wet years for use during the dry ones.

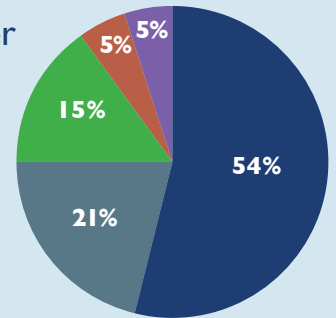
<sup>1</sup> The United States Supreme Court confirmed this apportionment. *Arizona v. California*, 376 U.S. 340 (1964)

## Utah's Colorado River Allocation

The seven river basin states, including those located in the upper and lower basins, have the right to develop and beneficially use the Colorado River water allocated to them under the Law of the River. Utah's Colorado River Compact allocation is 1.725 million acre feet of water, or 23% of the Upper Basin's compact allocation. Of that amount, Utah has plans to develop approximately 1.4 million acre feet, reserving more than 350,000 acre feet to account for climate change. The state is currently using less than one million acre feet.

### Utah's Colorado River Compact Allocation

- Average Use (2013-2017)
- Lake Powell Pipeline
- Average Evaporation
- Unused Supply
- Climate Change Reserve



## The Colorado River's Track Record

Both tree ring data and human measurements confirm that the Colorado River system has experienced many cycles of drought and recovery dating back hundreds of years. A National Research Council report, "Colorado River Basin Water Management: Evaluating and Adjusting to Hydroclimatic Variability," noted that the data show several periods of time in which flows measured lower than those assumed in the 1922 Colorado River Compact.

In both wet and dry cycles over the past century, the river has always provided enough water to meet established uses and compact requirements. Recent hydrologic modeling, based on projected drought scenarios, has shown the river to be a reliable supply for the upper basin into the future.

The system's reliability is documented in the 71st Annual Report of the Upper Colorado River Commission. The report cites that, during the 10 years preceding its issuance, which had been some of the driest of the last century, the upper

basin states (Colorado, Wyoming, New Mexico and Utah) delivered more than 93 million acre feet of water to the lower basin states (Nevada, Arizona and California)—that's 18 million acre feet more than required by the Colorado River Compact.<sup>2</sup>

The Law of the River does not allocate water to the states on a "first in time, first in right" basis. The compacts were expressly developed to ensure that faster growing states would not be able to claim all of the available basin water. Utah has the right to develop its 23% share of the Upper Basin allocation whenever the demand for such water arises. The amount of water specifically available to the LPP is, in turn, subject to state administrative principles. The mainstem water right being used by LPP carries a priority that has never been curtailed or called out pursuant to the state system of water rights administration. According to Utah's former state engineer, Kent Jones, Lake Powell is "one of the firmest water supplies in Utah's allocation of the Upper Colorado River Basin."

<sup>2</sup> 71st Annual Report of the Upper Colorado River Commission, September 2020;  
<http://www.ucrccommission.com/wp-content/uploads/2020/05/UCRC-2019-Annual-Report-Final-May-15-2020.pdf>



## Looking Ahead

The 2012 Basin Study and associated climate model projections indicate a potential decrease in mean natural flow of the Colorado River of approximately 9% over the next 50 years. In addition, some scientists predict that as a consequence of continued warming in the basin, the decrease in river flows could be even greater.

Modeling conducted by BOR in August 2018, taking into account future water uses in the upper basin including the LPP, indicates a near 0% chance of a declared 1922 Compact shortage for the upper basin through the year 2050 presuming hydrology remains similar to what the basin has experienced over the last 100 years. On the other hand, if the future hydrology of the basin is similar to the drier, hotter climate change predictions, and more closely resembles the last 30 years, including a period of historic drought, the probability of a declared 1922 Compact shortage rises to less than 13% through the year 2050.

BOR and the states are planning for the possibility of a long-term imbalance in supply and demand. BOR has identified a number of “options and strategies to resolve supply and demand imbalances” and is actively encouraging stakeholders to work together to advance strategies and implement actions that will significantly reduce shortage risks. The seven basin states recently signed drought contingency plans (DCPs) designed to help ensure compact compliance and reduce the risk of future shortages.

In conjunction and coordination with the development of the DCPs, the states and individual water suppliers are enhancing water conservation and reuse practices, identifying supplemental or surplus supplies, exploring reservoir reoperations, and brokering water sharing or transfer agreements between users, including with agriculture.



## What if Shortages Occur?

If temporary Colorado River supply interruptions arise due to a declared system shortage, the Upper Colorado River Commission and the four upper basin states would determine how to allocate upper basin water equitably based on a number of factors, including the Law of the River, existing agreements and available scientific data. Each state would determine how water users subject to its jurisdiction would share in the state's portion of the available supply. It is anticipated that basic domestic needs would take priority.

Even if there were an interruption in LPP deliveries due to a Colorado River system shortage declaration, it would be temporary in nature, may not entail more than a partial curtailment of LPP deliveries, and would be accommodated

under applicable comprehensive state and local water supply plans. LPP beneficiaries would, for a period of time, rely on water that has been placed in underground storage, increased groundwater pumping or other interim measures. Such a low risk eventuality, for which a prudent backup plan is nevertheless in place, does not affect the viability of this essential second source of water supply for southwestern Utah.

What all this all means for southwest Utah is that there is no imminent threat to LPP water supplies. The Colorado River, in conjunction with other existing or planned supplies, is more than capable of providing the water necessary to sustain the 10 communities who are beneficiaries of the project.