Four West Slope Basin Roundtables

Joint Meeting Agenda

Thursday, June 20, 2019; 10 a.m. to 3 p.m.

Ute Water Building, 2190 H 1/4 Road, Grand Junction, CO 81505

- Colorado Basin Roundtable
- Gunnison Basin Roundtable
- Southwest Basin Roundtable
- Yampa-White-Green Rivers Basin Roundtable

10:00 Welcome and Purpose of the Meeting
Chairs: Jackie Brown, YWG; Kathleen Curry, Gunnison; Jim Pokrandt, Colorado; Mike Preston, Southwest

10:15 Drought Contingency Plan Overview
Karen Kwon or Amy Ostdiek – Colorado Attorney General's Office

10:30 Phase III Risk Study Update
John Carron, Hydros Consulting; John Currier, Chief Engineer, Colorado River District

11:30 Phase III Risk Study Q&A: Panel with John and John

12:00 Box Lunches

12:30 CWCB Update on its Demand Management Workgroups
Brent Newman

12:45 Roundtables-Level Demand Management Workgroup Updates
Representatives from the 4WSBRTs

1:15 IBCC Demand Management Initiative
Russ George, IBCC Director

1:35 Colorado Water Bank Workgroup Update/Secondary Impacts Study
Chris Treese, Colorado River District

1:50 Colorado Water Plan Funding
Tim Wohlgenant

2:10 Facilitated Discussion of What's Next

3:00 End of Meeting

4WSBRT Zoom Access to the meeting

Topic: Western Slope Roundtables
Time: Jun 20, 2019 10:00 AM Mountain Time (US and Canada)

Join Zoom Meeting
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Joint Four West Slope Roundtable
Colorado River Risk Study Discussion Guide

6/20/19 - Ute Water Building - Grand Junction, Colo.

At the December 14, 2014 joint meeting of the four West Slope Roundtables, participants requested information to facilitate intra-basin discussion of demand management, should low levels at Lake Powell require that tool, as well as discussion of potential future development of West Slope Colorado River system supplies. In response, the Colorado River District and Southwestern Water Conservation District proposed Phase I of the Colorado River Risk Study. Each district and each Roundtable shared in the costs. This continued into a Phase II. Today we will learn about the work of Phase III. Keep in mind that the work resulting from the Risk Study is for discussion purposes only, that it does not represent the official position of any entity with respect to factual or legal matters concerning the Colorado River.

Major aspects of Phase I

1. To maintain the storage levels at Lake Powell above elevation 3,525 feet (above sea level), **demand management would be occasionally needed under all different hydrology and demand scenarios.** Without corrective action (implementing Drought Contingency Plans), **the risk that Lake Powell would be drained below critical levels is real (10-20%).**
2. **Demands and hydrology matter, the drier the hydrology, the more often demand management is needed and the larger the shortages that must be covered. Demands also matter**. For the same hydrology, the higher the level of consumptive uses, the more often demand management is needed**. A 10% increase in Upper Basin depletions roughly doubles the frequency that demand management is needed and doubles the amount of the large shortages** that will have to be covered by demand management.
3. During the rare severe droughts such as 2000-2004 or the 1950s, the amount of water needed by demand management can exceed 1 million acre-feet -- far more than the amount of water that could be obtained by demand management in a single year**. This means that, as a practical matter, demand management will have to be designed as a water bank or reserve account,** where smaller annual contributions are made annually into a "bank" then released to Lake Powell when needed.

During the presentations to the Roundtables, there were many questions about how the implementation of demand management would impact projects and water use within the individual basins. The Phase I study used the Bureau of Reclamation's CRSS (model) which is a

good model for operating the Colorado River system (the big reservoirs like Powell and Mead) but can't be used to look at the details of what happens within the West Slope sub-basins. To address these more specific questions and to consider further system questions, we moved forward with phases II and III.

Major aspects from Phase II

Phase II had two basic technical tasks. The first task was to again use the Bureau of Reclamation's Colorado River Simulation System (CRSS) computer model to look a paleo-hydrology scenario and to consider in more detail a demand-management approach utilizing a demand-management concept of putting a smaller amount (for example 100,000 acre-feet per year) into a dedicated water bank, then using the banked water for demand management. The results of this task were consistent with the Phase I results. **The concept of water bank works provided dedicated reservoir space is available and there is water in the bank when the drought begins.**

The second task was to look at how to use CRSS in conjunction with Colorado's State-Mod computer model to look at the basin-specific impacts of demand management. State-Mod is water-rights based and models the operation of diversions and projects within Colorado (but ends at the state line). **The task results were successful and we now have the ability look at the basin-specific questions related to demand management options.**

Major aspects from Phase III

(See the full slide deck appended to this packet)

GENERAL OBSERVATIONS

1. Of Colorado's approximate 2.5 million acre-feet (maf) of average annual consumptive use, approximately 1.6 maf is attributable to Pre-Compact rights, and approximately 900,000 acre-feet is Post-Compact

2. Transmountain diversions (TMDs) constitute over half of the Post-Compact depletions (~56%)

3. Because of #2, the Colorado Mainstem users comprise 2/3 of all Post-Compact uses

4. The large TMDs often end up being the swing call, even across different volumetric reductions

5. Allocating deficit volumes pro-rata by sub-basin depletions results in substantially different administration dates for certain sub-basins when compared to a state-wide curtailment of all Colorado River water users.

What does modeling tell us about risk?

Model analysis from Phase III of the Risk Study using the 1988-2015 Stress Test Hydrology indicates:

1. The likelihood of Lake Powell Dropping below 3525 feet in elevation at some point in the next 25 years is about 39% (11 of 28 traces).

2. The likelihood of the 10-year running average Lee Ferry volume dropping below 82.5 maf is about 46% (13 of 28 traces)

3. The likelihood of the 10-year running average Lee Ferry volume dropping below 75 maf is about 0%* (0 of 28 traces)

An increase in annual Upper Basin Consumptive Use averaging 11.5% (approximately 500,000 acre-feet** roughly doubles the risk of #1 and #2.

*Note that previous Risk Study simulations and Reclamation runs have shown likelihoods greater than zero at the 75 maf threshold (Model assumptions matter!)

**The Upper Colorado River Commission Demand Schedule anticipates reaching that level of use by about 2037.

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A Closer Look at Pre/Post Compact Depletions

Basin	Average Annual Depletions (acre-feet)		
	All Users	Pre-Compact	%Pre-Compact
Yampa	196,982	138,544	70%
White	62,060	50,173	81%
Colorado	1,220,386	594,169	49%
In-Basin	*669,397*	*574,997*	*86%*
TMDs	*550,989*	*19,173*	*3%*
Gunnison	552,418	495,147	90%
Southwest	500,717	322,561	64%
Total	2,532,564	1,600,594	63%

All Results Presented herein are Preliminary and Subject to Change

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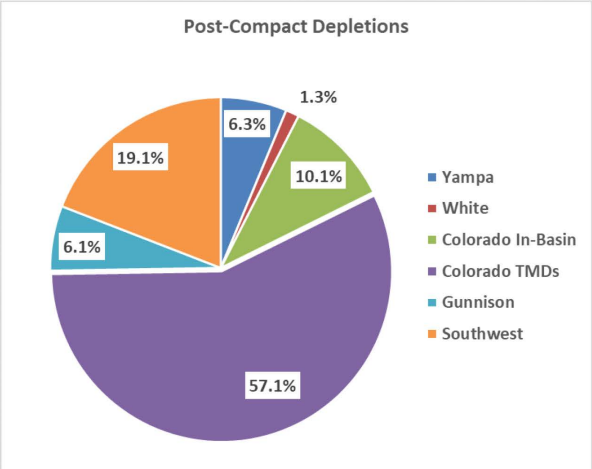
Who is Impacted by Curtailment of all Post-Compact Rights?

Basin	Average Annual Depletions (af)	
	Post-Compact	% of Total
Yampa	58,438	6.3%
White	11,887	1.3%
Colorado	626,216	67.2%
In-Basin	*94,400*	*10.1%*
TMDs	*531,816*	*57.1%*
Gunnison	57,271	6.1%
Southwest	178,157	19.1%
Total	931,969	100.0%



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Big River Challenges: Background Conditions, Actions and Planning

1. Since 2000 to now, the Colorado River system has experienced an extended dry period. **<u>During this 19-year period, the average natural flow at Lee Ferry has averaged about 12.4 million acre-feet per year through 2017.</u>** This is about 20% below the long term (1906-2015) average of 14.8 million acre-feet per year.
2. Science suggests that **<u>as regional temperatures increase, this drying trend will continue.</u>**
3. At the beginning of 2000, system-wide reservoir storage (Mead, Powell and the other CRSP reservoirs) was nearly full. **<u>Today system storage is less than 50% full.</u>**
4. **<u>Annual releases from Glen Canyon Dam (Lake Powell) are controlled by the 2007 Interim Guidelines.</u>** The guidelines were negotiated by the basin states (and the federal agencies) and approved by the U.S. Secretary of the Interior. Under the guidelines, the operations of the Lakes Mead and Powell are integrated. The guidelines will expire after water year 2026 and will have to be renegotiated. The negotiations are scheduled to commence in 2020.

5. **In 2013, to address continuing drought, the basin states began preparing Drought Contingency Plans (DCPs).** There are now two integrated plans, one for the Upper Basin and one for the Lower Basin.
6. **Colorado's Water Plan** was finalized in November 2015. The plan includes what is referred to as the "conceptual framework." The framework was negotiated and approved by the Interbasin Compact Committee (IBCC). **The principles are intended to guide the development of new supplies and the protection of existing uses** within Colorado. **Principle #4 provides that Colorado will take a proactive approach to avoiding a future compact deficit. The program will cover existing uses plus a reasonable** growth within the Colorado River Basin, but not new transmountain diversions.

Drought Contingency Plans (DCPs)

1. The **Upper Basin DCP** includes three basic elements:
   a. **Drought operations of the Colorado River Storage Project (CRSP) storage reservoirs upstream of Lake Powell – Blue Mesa, Navajo and Flaming Gorge Reservoirs.** These three reservoirs were authorized under the same federal law as Lake Powell, the 1956 Colorado River Storage and Participating Projects Act. Although smaller, they have the same basic purpose as Lake Powell – re-regulation of the Colorado River so that the Upper Basin can develop its water resources while meeting its compact obligations at Lee Ferry. Under Drought Operations, additional releases will be made from these reservoirs to help maintain Lake Powell above critical levels.
   b. System augmentation: this consists of **cloud seeding and non-native vegetation control of phreatophytes.** This element of the DCP is already underway.
   c. **Demand Management: Under the DCP, the Upper Division states agree to investigate programs to reduce consumptive uses** (referred to as demand management) as needed to avoid Lake Powell storage dropping below critical levels. None of the states, including Colorado, has made a formal decision to implement demand management. The commitment is only to study the feasibility of demand management.

What are the critical storage levels in Lake Powell?

The goal of the Upper Basin DCP is to take proactive measures to always have a storage cushion in Lake Powell. The theory is that as long as the Upper Basin has some storage available, it will have the water on hand to meet its downstream commitments**. The current target (which is subject to change) is elevation 3,525 feet above sea level. At this this elevation, there is only 2 million acre-feet of storage available until minimum power.** There is another 4 million acre-feet of storage below minimum power, but above the low-level outlet works (this is referred to as inactive storage).

While the primary purpose of the DCP is to pro-actively meet downstream commitments, maintaining minimum power has major side benefits. Power revenues, pay for the operation of the CRSP reservoirs, repay the federal government for the costs of the projects and fund critical environmental programs. Further, because the capacity of the dam's outlet works drops with the elevation of the reservoir, dropping below minimum power may prevent the Upper Basin from actually meeting its downstream requirements. This is referred to as a compact hole.

2. **The Lower Basin DCP,** which covers mainstream uses in and below Lake Mead – not the Lower Basin tributaries – is designed to add to the shortages that are required by the 2007 Interim Guidelines. As Lake Mead drops toward critical storage levels, **defined as elevation 1,020 feet in Lake Mead**, the three Lower Division states ramp up their conservation measures to preserve storage in Lake Mead. **If Lake Mead was forecast to drop below 1,025 feet, then the combined effect of the Lower Basin DCP and the 2007 Interim Guidelines results in a reduction of about 1.4 million acre-feet per year.**
3. Minute 323 with Mexico: **Under Minute 323,** which is effective through the term of the 2007 Interim Guidelines, Mexico both shares shortages when the 2007 Interim Guidelines require a shortage and, similar to the DCP, they will implement additional conservation measures.

Total Contemplated Lower Basin Volumes (in KAF)
2007 Interim Guidelines, Minute 323, Lower Basin Drought Contingency Plan &
Binational Water Scarcity Contingency Plan

Lake Mead Elevation (ft msl)	2007 Interim Guidelines Shortages		Minute 323 Delivery Reductions	Total Combined Reductions	DCP Contributions			Binational Water Scarcity Contingency Plan Savings	Combined Volumes by Country *US: (2007 Interim Guidelines Shortages + DCP Contributions)* *Mexico: (Minute 323 Delivery Reductions + Binational Water Scarcity Contingency Plan Savings)*					Total Combined Volumes
	AZ	NV	Mexico	***Lower Basin States + Mexico***	AZ	NV	CA	Mexico	*AZ Total*	*NV Total*	*CA Total*	*Lower Basin States Total*	*Mexico Total*	***Lower Basin States + Mexico***
1,090 - >1,075	0	0	0	***0***	192	8	0	41	192	8	0	*200*	*41*	***241***
1,075 - >1050	320	13	50	***383***	192	8	0	30	512	21	0	*533*	*80*	***613***
1,050 - >1,045	400	17	70	***487***	192	8	0	34	592	25	0	*617*	*104*	***721***
1,045 - >1,040	400	17	70	***487***	240	10	200	76	640	27	200	*867*	*146*	***1,013***
1,040 - >1,035	400	17	70	***487***	240	10	250	84	640	27	250	*917*	*154*	***1,071***
1,035 - >1,030	400	17	70	***487***	240	10	300	92	640	27	300	*967*	*162*	***1,129***
1,030 – 1,025	400	17	70	***487***	240	10	350	101	640	27	350	*1,017*	*171*	***1,188***
<1,025	480	20	125	***625***	240	10	350	150	720	30	350	*1,100*	*275*	***1,375***

The US will work to create or conserve 100,000 af or more of Colorado River system water on an annual basis to contribute to conservation of water supplies in Lake Mead and other Colorado River reservoirs. All actions taken by the United States shall be subject to applicable federal law, including availability of appropriations.

Principle #4 of the Conceptual Framework in Colorado's Water Plan

Chapt. 8, pp 14-17

Principle #4 of the Framework is a critical policy statement and the primary reason the West Slope Roundtables asked for the risk study. This principle states that "a collaborative program that protects against involuntary curtailment is needed for existing uses and some reasonable increment of future development in the Colorado River system, but will not cover a new TMD." The supporting information notes that the collaborative program "should provide a programmatic approach to managing Upper Basin consumptive uses, thus avoiding a Compact deficit and insuring that system reservoir storage remains above critical levels such as minimum (power)." The similarities between the objectives of the Upper DCP and the collaborative program are obvious. During the IBCC discussion of the Framework, it was recognized that the collaborative program and the long term Upper Basin DCP would be the same. Drought operations of the CRSP reservoirs and demand management would be the primary components.