

The Lower Basin Drought Contingency Plan: Development and Delays

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Water Policy in Arizona and the Semi-arid West – Research Paper

1. Abstract

This Research Paper will discuss the Lower Basin Drought Contingency Plan, a voluntary agreement developed to conserve water in the Lower Basin system and protect water supplies in Lake Mead. The Lower Basin Drought Contingency Plan (LBDCP) was produced through a series of negotiations between Arizona, California, Nevada, and Mexico. Though the outlines of the LBDCP are largely fleshed out, the Plan has not yet been enacted due to political complications. The structure of this Research Paper will include a Literature Review, Results Section, and Policy Discussion Section. The Literature Review will trace the development of the LBDCP from initial discussions to the present, while the Results Section will describe the current iteration of the LBDCP in full. The Policy Discussion Section will describe current complicating factors that have prevented LBDCP adoption and recommendations to move past the impasse.

2. Methodology

Research for this paper was made difficult by the continued and current (as of May 3rd, 2018) negotiations over the LBDCP. While no formal agreement has been finalized or published, alternative information sources provided sufficient information to flesh out a narrative of the LBDCP development. Prior signed and enacted intergovernmental agreements and official federal studies provide the foundation to contextualize the LBDCP process. News articles were then used to begin constructing a narrative framework of the LBDCP negotiations. This narrative was further developed using water agency presentations and memoranda made publicly available via online archives. These presentations and memoranda, while not always explicitly describing the development of the LBDCP, give context to the news articles while providing a primary source. Additionally, interviews were conducted for this to further fill in the gaps, especially in the early LBDCP negotiations where written documentation is lacking. Finally, informal sources such as blog posts, press releases, and public interviews were added to complete the picture.

3. Literature Review

3.1. 2007 Interim Guidelines

Before diving into the initial stages of the LBDCP development, an explanation of the prior conditions is needed. On December 13th, 2007, the *2007 Colorado Interim Guidelines for Lower Basin Shortages and the Coordinated Operations for Lake Powell and Lake Mead* (2007 Interim Guidelines)¹ were signed and enacted. The full story on the development of this interstate agreement between Arizona, California, and Nevada is outside of the scope of this paper, but it began in earnest with a 2005 public process to develop operation rules for shortages in Lake

Powell and Lake Mead.¹ As described in the document, a consensus developed on the following themes: “encourage conservation, plan for shortages, implement closer coordination of operations of Lake Powell and Lake Mead, preserve flexibility to deal with further challenges such as climate change and deepening drought, implement operation rules for a long – but not permanent – period in order to gain valuable operating experience, and continue to have the federal government facilitate – but not dictate – informed decision making in the Basin”.¹ Through this process, participants in the plan identified four actions included in the final 2007 Interim Guidelines that took effect immediately and were to last through 2026 (hence the name “Interim”). These actions were as follows:

- 1) discrete levels of Lake Mead at which reductions in water deliveries to Nevada and Arizona would occur,
- 2) the development of coordinated operations between Lake Mead and Lake Powell to minimize shortages in Lake Mead,
- 3) the creation of the Intentionally Created Surplus (ICS) program to encourage water conservation by allowing the holding of unused or surplus water in reservoirs without forbearance and right to use the water later², and
- 4) the modification of interim surplus guidelines through 2026.

The 1st and 3rd actions are most relevant to the LBDCP and will be described in further detail below.

3.2. Action 1 of 2007 Interim Guidelines

The discrete levels developed for the 2007 Interim Guidelines were tiered at Lake Mead elevation levels of 1075’, 1050’, and 1025’. At each elevation, a new set of cuts to water deliveries would be implemented. According to the Interim guidelines, the Secretary of Interior will declare a shortage when the August 24-month projections by the U.S. Bureau of Reclamation (USBR) show a January 1 Lake Mead elevation below 1075’.² At that point Arizona will have a cutback of 320 KAF (thousand Acre-feet) and Nevada will have a cutback of 13 KAF. At 1050’ the cumulative cuts will bump up to 400 KAF for Arizona and 17 KAF for Nevada. Finally, at 1025’ Arizona will face cuts of 480 KAF and Nevada will see cuts of 20 KAF. It should be noted that throughout this process California will not see supply reductions from the Colorado River system. In November of 2012, the shortage sharing guidelines were modified by Minute 319 of the *United States-Mexico Treaty on Utilization of Waters of the Colorado and Tijuana Rivers and of the Rio Grande* (US-Mexico 1944 Water Treaty)³. As part of Minute 319, Mexico volunteered to accept reductions in delivery at the same Lake Mead elevations outlined in the 2007 Interim Guidelines. Those cuts were 50 KAF, 70 KAF, and 125 KAF at the respective elevations of 1075’, 1050’, and 1025’.³ Table 1 below shows specific 2007 Interim Guideline and Minute 319 cuts triggered by Lake Mead elevations.

Lake Mead Elevation	Arizona Reduction	Nevada Reduction	California Reduction	Mexico Reduction
1075'	320,000 AF	13,000 AF	0 AF	50,000 AF
1050'	400,000 AF	17,000 AF	0 AF	70,000 AF
1025'	480,000 AF	20,000 AF	0 AF	125,000 AF

Table 1. Cuts to deliveries triggered by Lake Mead elevation levels.^{1,3}

3.3. Action 3 of 2007 Interim Guidelines

The second equally important action of the 2007 Interim Guidelines, Action 3, created a program known as Intentionally Created Surplus (ICS). The ICS was key to the 2007 Interim guidelines because it allowed banking of unused water without a total loss to the system or to other users in the system². The ICS program created four unique ICS categories. They were:

- 1) Extraordinary Conservation ICS – created through fallowing of land, canal lining, desalination in lieu of Colorado River water, conservation programs enacted prior to the 2007 Interim Guidelines,
- 2) Tributary Conservation ICS – the purchase of water rights on a Colorado River tributary in the ICS Contractor’s state,
- 3) System Efficiency ICS – water saved via the contribution of capital by an ICS contractor to the United States for projects to increase system efficiencies,
- 4) Imported ICS – non-Colorado River System water introduced into the Colorado River proper.¹

To create an ICS the contractor needs to have a predetermined plan submitted and allow for a one-time 5% deduction of volume from the ICS to Colorado River System.¹ The 2007 Interim Guidelines also capped the maximum volume of per year ICS creation at 400 KAF for California, 125 KAF for Nevada, and 100 KAF for Arizona, while simultaneously capping a maximum accumulation of ICS credits at 1.5 MAF (million acre-feet) for California and 300 KAF for Nevada and Arizona.¹ The rules created in the 2007 Interim Guidelines also prevent delivery of ICS volumes unless the elevation of Lake Mead is above 1075' and the Secretary of Interior has determined and ICS Surplus Condition.

3.4. Actions taken following 2007 Interim Guidelines

After the 2007 Interim Guidelines were put into place, there was a collective feeling of ‘mission accomplished’ among the water management community of the Colorado River Basin. In a 2018 interview with KRCC, Ted Cooke (General Manager of the Central Arizona Project), described the prevailing belief that the 2007 Interim Guidelines would not be immediately necessary.⁴ He said: “I think everybody was subconsciously thinking well this will be over soon, probably. Droughts don’t last that long ... But ten more years of it has gone by now. And it may be the new normal”.⁴ This assumption was challenged in 2012 by the Bureau of Reclamation’s *Colorado River Basin Water Supply and Demand Study*. Using the Colorado River Simulation

System (CRSS), the USBR found the median supply-demand imbalances were modeled to reach 3.2 MAF by 2060.^{5,6} In reality, prior to the Supply and Demand report, the managers of the Lower Colorado River system had already discovered a ‘structural deficit.’ According to Ted Cooke in a post on the Central Arizona Project (CAP) webpage in 2015, between 2000 and 2013, at least 8.23 MAF was released from Lake Powell to Lake Mead each year.⁷ However, Lake Mead still fell 100 feet because the 8.23 MAF release only covered a portion of the 9 MAF delivered to the three states and Mexico.⁷ Add in the gains from small tributaries between Lake Powell and Lake Mead and take away approximately 600 KAF of evaporative losses in Lake Mead, and you have a net annual loss in Lake Mead of 1.2 MAF.⁷

In response, in July 2013 then-Secretary of Interior, Sally Jewell, convened the seven Colorado River Basin states (Arizona, California, Colorado, Nevada, New Mexico, Utah, and Wyoming) to see if they were prepared for a continuation of a 2000 to 2013 type drought.⁸ When the states’ response was a resounding ‘no’, a legal-technical group was convened with representatives of each Basin state and agencies within the states to evaluate what steps could be taken to address the near-term and long-term risk.^{8,9} According to Chuck Collum, the Colorado River Programs Manager at CAP, the legal-technical group was tasked with developing “out of the box” solutions for the Basin system.⁹ By the end of 2013 and beginning of 2014, the legal-technical group had proposed approximately 42 concepts that could be layered together to reduce the near and long term risk to the Colorado River System.⁹ Two Lower Basin programs grew out of the legal-technical group’s concepts. Known as the PSCP (Pilot System Conservation Program) and the MOU (Pilot Drought Response Memorandum of Understanding), these voluntary agreements were designed to reduce the risk of Lake Mead dropping below 1075’.

3.5. Pilot System Conservation Program (PSCP)

The first voluntary agreement resulting from the legal-technical group was the Pilot System Conservation Program (PSCP). Known formally as the “Agreement among the United States of America, through the Department of the Interior, Bureau of Reclamation, the Central Arizona Water Conservation District, the Metropolitan Water District of Southern California, Denver Water, and the Southern Nevada Water Authority, for a Pilot Program for Funding the Creation of Colorado River System Water through Voluntary Water Conservation and Reductions in Use,” the agreement was signed and became effective on the 30th of July, 2014.¹⁰ This agreement provided for the phased implementation of conservation projects funded jointly by the participating agencies described in the full title of the PSCP. The conservation measures were primarily focused on funding to fallow agricultural fields or pay for efficiency improvements. The water conserved as part of the PSCP only went to increasing storage levels in Lake Mead and Lake Powell and did not add to storage accounts for any individual user.¹¹ Two phases have been completed between October 2014 and the end of 2017 as part of the PSCP, with Phase 1 conserving approximately 63 KAF and Phase 2 conserving 54 KAF, for a total program cost of \$18.6 million.¹¹ The PSCP Phase 2 water conservation projects were completed in conjunction with the Tohono O’odham Nation and Colorado River Indian Tribes to conserve 20 KAF.¹¹ As of May 3rd, 2018 there is a new solicitation by the USBR for competitive proposals for Phase 3 funding of the PSCP.¹² Phase 3 will fund projects of the same nature as Phases 1 and 2.

3.6. Pilot Drought Response Memorandum of Understanding (MOU)

The other voluntary agreement to come out of the legal-technical group was the informally known Pilot Drought Response Memorandum of Understanding (MOU), which was signed on the 10th of December 2014. Like the PSCP, the MOU has an equally cumbersome full title of “Memorandum of Understanding Among the United States of America, through the Department of Interior, Bureau of Reclamation, the Central Arizona Water Conservation District, the Metropolitan Water District of Southern California, the Southern Nevada Water Authority, the Arizona Department of Water Resources, the Colorado River Board of California and the Colorado River Commission of Nevada for Pilot Drought Response Actions”.¹³ The Pilot Drought Response MOU expressly explains that the program was developed in response to the 2012 Colorado River Basin Study’s findings of a long-term imbalance between supply and demand.¹³ In response, the parties to the MOU committed to the between 1.5 and 3.0 MAF of “Protection Volume” between 2014 and end-of-year 2019.¹³ The Protection Volumes could be generated through expanded ICS creation, reductions in water use, or other actions to increase Lake Mead elevations. As part of the MOU, the Central Arizona Water Conservation District (CAWCD) agreed to save 345 KAF while the Metropolitan Water District of Southern California (MWD) agreed to a conservation volume of 300 KAF. The USBR and the Southern Nevada Water Authority (SNWA) agreed to reductions of 50 KAF and 45 KAF respectively. The MOU explicitly states that reductions cannot come from PSCP conservation savings. The CAWCD estimated that the actions taken by the parties involved in the PSCP and MOU had collectively boosted the Lake Mead’s elevation by nearly 5 feet by April 2016. Both the PSCP and MOU are still currently in effect.

3.7. Prelude to the LBDCP

At the same time that the legal-technical team was developing the framework that would become the PSCP and MOU programs, the USBR and SNWA began modeling the hydrology of the Lower Basin system. In the Fall of 2013, the legal-technical team found that a repeat of the post 1980s dry period would crash Lake Mead levels.^{8,14} The other agencies in the Lower Basin, particularly MWD and CAWCD, have the modeling capability to also test this proposal, but no public record of similar tests by those agencies exists.¹⁴ Further runs of the CRSS model in 2015 included what was known as a “stress test”.^{9,14,15} The stress test used the dry conditions seen in the recent 25-year period from 1988 to 2012 to simulate the a potential impacts of continued drought conditions.¹⁴ The CRSS model included the rules for the 2007 Interim Guidelines and the actions taken as part of the PSCP and MOU programs.⁹ The results were sobering. As shown in Figure 1 below, the stress test modeling predicted that with “no action” there would be 25 percent chance of Lake Mead hitting 1020’ by 2026.^{15,16} According to Chuck Collum of CAWCD, the narrowing shape of Lake Mead (an inverted triangle) increases the speed of hitting lower elevations, so 1020’ quickly leads to 1000’ and then dead pool (895’) can then be reached within 36 months.⁹

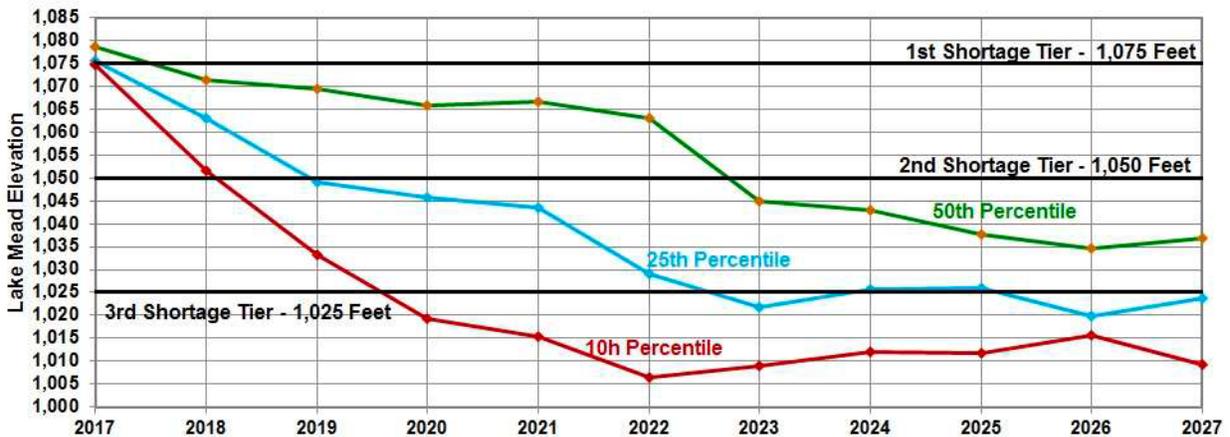


Figure 1. Lake Mead modeled elevations using “Stress Test” hydrology and implementation of no actions other than 2007 Interim Guidelines. From November 22nd, 2016 presentation by Tom Buschatzke.¹⁷

3.8. Response to CRSS Modeling

In response to these modeling results, the USBR convened representatives of Arizona, California, and Nevada to, as Kathryn Sorenson of Phoenix Water put it in her memorandum to the Phoenix City Council, “[discuss] how to prevent shortages that could cause great economic disruption”.¹⁸ The Bureau of Reclamation noted that the 2007 Interim Guidelines would work but there was a need for a ‘contingency’ plan in case the 2007 Interim Guidelines proved insufficient.⁹ It is unclear if Mexico was included in the initial negotiations, but by the December 2016 memo written by Kathryn Sorenson, they were mentioned as a party to the negotiations.¹⁸ Bill Hasencamp, Manager of Colorado River Resources for MWD believes that the drive for negotiations was driven by the Arizona water management community’s need to “show progress on resolving the system imbalance before a shortage” and also “show California was participating in cutbacks at certain levels to make it easier for Arizonans to accept water shortages”.¹⁹ Although there is little information available on the initial negotiations to produce what would become the LBDCP, by early 2016 the negotiations were well underway. There were simultaneous efforts to produce an Upper Colorado River Basin version of the LBDCP that would be known as UBDCP (Upper Basin Drought Contingency Plan).⁸ A brief blog post on April 25th, 2016 by Arizona Department of Water Resources Director (ADWR) Tom Buschatzke on the CAWCD website alluded the importance of an Upper Colorado River Basin plan: “Actions contemplated by all three states [Arizona, Nevada, and California] are groundbreaking, unprecedented and the negotiations are sensitive and difficult. Those discussions continue to evolve... If the states can reach a new agreement – no sure thing at this state – the impact will be more significant than the cutbacks agreed to in 2007”.²⁰

3.9. Public Release of Lower Basin Drought Contingency Plan (LBDCP)

This section will describe the LBDCP in broad strokes and discuss the public presentations and negotiations that occurred up to the most recent draft of the LBDCP presented in August 2017. The discussions that continued after this date will be reviewed in the Policy Discussion section.

The complete terms and proposals of the current iteration of the LBDCP will be explored further in the Research Results section.

By mid-2016, the LBDCP negotiations were largely complete and an informal term sheet had been prepared.⁹ The first public presentation of the LBDCP occurred on July 25th and 26th, 2016 at a CAP Tribal, Municipal & Industrial, and Agricultural Stakeholder Meeting held by the CAWCD.²¹ In this presentation they officially laid out the proposed LBDCP as an “insurance policy” to provide more certainty and greater protection of Colorado River supplies” with the goal to “bend the curve” in the decline of Lake Mead”.²¹ The CAP presentation primarily highlighted the new elevation levels chosen to enact steeper cuts to water deliveries, including a cut to California’s water supply for the first time. These changes in supply reductions would be overlain on the existing 2007 Interim Guideline numbers. A new shortage level would occur at 1090’ at which point Arizona and Nevada would see an immediate supply reduction of 192 KAF and 8 KAF.²¹ New tiers would be enacted at 1045’, 1040’, 1035’, and 1030’, with 1045’ being the elevation that cuts to the California supply would begin. Table 2 below shows the proposed LBDCP reductions. These numbers have remained largely unchanged to the present, with the exception of additional voluntary Mexican cuts to deliveries as part of Minute 323 of the US-Mexico 1944 Water Treaty.

Lake Mead Elevation	AZ Total	NV Total	CA Total	USBR	Mexico Minute 319	Total
1090’	192,000 AF	8,000 AF	0 AF	100,000 AF	0 AF	300,000 AF
1075’	512,000 AF	21,000 AF	0 AF	100,000 AF	50,000 AF	683,000 AF
1050’	592,000 AF	25,000 AF	0 AF	100,000 AF	70,000 AF	787,000 AF
1045’	640,000 AF	27,000 AF	200,000 AF	100,000 AF	70,000 AF	1,037,000 AF
1040’	640,000 AF	27,000 AF	250,000 AF	100,000 AF	70,000 AF	1,087,000 AF
1035’	640,000 AF	27,000 AF	300,000 AF	100,000 AF	70,000 AF	1,137,000 AF
1030’	640,000 AF	27,000 AF	350,000 AF	100,000 AF	70,000 AF	1,187,000 AF
1025’	720,000 AF	30,000 AF	350,000 AF	100,000 AF	125,000 AF	1,325,000 AF

Table 2: LBDCP proposed reductions modified from July 25/26 presentation by CAP.²¹

As demonstrated in this table, there is an immediate 300 KAF cut to supplies at 1090’ and while the California cuts do not occur until 1045’, they get increasingly steep with each additional 5 foot drop in Lake Mead Elevation. While the primary message of the CAP presentation was the importance of a reduction in deliveries, an August 22, 2016 presentation made by ADWR director Tom Buschatzke noted the LBDCP plan also included modifications to the ICS guidelines.¹⁶ These included an agreement to allow ICS withdrawals at lower Lake Mead elevations and modification of the evaporative loss calculations applied ICS volumes.¹⁶ Buschatzke also indicated that the LBDCP would remain in effect until new Interim Guidelines took effect in 2026.¹⁶ This was the first mention of a modification to the ICS rules. In his presentation, Buschatzke also explained that the DCP was a formal policy matter, and would need to be approved by the Arizona Legislature.

3.10. LBDCP Modifications to the ICS

Bill Hasencamp of MWD noted in an interview with the author that California had two goals when it entered into the LBDCP negotiations, “(1) to establish reasonable water reductions to California if drought conditions worsened; and (2) to be able to access our ICS storage in shortage years” and he felt that they accomplished those goals.¹⁹ The importance of ICS rules modification can be seen in the next publicly available agency document, a MWD presentation of the Water Planning and Stewardship Committee on October 10, 2016. In this presentation, the MWD discussed how ICS volumes would be recoverable above 1025’, a modification from the 2007 Interim Guideline prohibition on ICS withdrawal below 1075’.²² Also Interstate banking would now be allowed above 1045’ and binational exchanges of water would be allowed above 1025’.²² The water reductions caused by the DCP cutbacks would also be recoverable by the Lower Basin states through 2057, and would be fully recoverable above a Lake Mead elevation of 1110’, with conditional withdrawals above certain levels.²² It was around this time the first media attention came to the LBDCP. Writing in the Arizona Hydrological Society blog on October 7th, 2016, Alan Dulaney was the first non-agency/management individual to report on the LBDCP. His post repeated the broad outlines presented by CAP, ADWR, and MWD, while also including a mention of then ongoing negotiations with Mexico to join the LBDCP as part of a new “Minute 32x” of the US-Mexico 1944 Water Treaty.²³ On November 16, 2016 Lauren Sommer and Grace Hood of KQED San Francisco presented the first media report on the LBDCP. Their article also touched on the broad points of the LBDCP, but introduced a new issue of how cutbacks affecting Imperial Irrigation District (IID) farmers.²⁴ As will be seen in the Policy Discussion section, this was only the beginning of a process that severely complicated the passage of the LBDCP.

4. Results

4.1. Components of the Lower Basin Drought Contingency Plan (LBDCP)

The Results section will describe the detailed components of the LBDCP. According to a January 5, 2017 presentation by the CAP²⁵, the LBDCP has three main components:

- Water Use Reductions,
- ICS Program Flexibility,
- Accounting and Recovery of LBDCP Water Use Reductions.

4.2. Water Use Reductions

The water delivery reductions in the current iteration of the LBDCP proposal have remained the same as the initially proposed reductions seen in Table 2 of this report. It should be noted that the LBDCP reductions are voluntary, as stated in Kathryn Sorensen’s December 13, 2016 memo to the Phoenix City Council. In it, she emphasizes that “no state has authority to force the holder of a federal contract for Colorado River water to relinquish its water”.¹⁸ Yet, in an interview on the We Are Rivers podcast, Kathryn Sorensen highlighted the symbolism of these reduction proposals.²⁶ For the first time California stepped up to reduce water deliveries, a

politically significant move because of their senior rights to the Colorado River water. She also commented that the LBDCP is structured to reduce water usage over a longer period of time in order to lessen the shock to the system caused by drastic cuts.²⁶ Modeling by CAP appears to confirm that initially sharp cuts from the LBDCP will impact farming and groundwater banking in Arizona, but ultimately provide better protection for higher priority Tribal and M & I water rights in Arizona.²¹ Table 3 below shows the most recent set of proposed water reductions in comparison to the original 2007 Interim Guideline. It can be seen that there is an additional voluntary commitment by Mexico to take reductions at the new Lake Mead lake level triggers proposed in the LBDCP. This came out of the Minute 323 negotiations of the US-Mexico 1944 Water Treaty that was formalized on September 21, 2017.²⁷ Known as the Binational Water Scarcity Contingency Plan (BWSCP), Mexico also agrees to an initially large reduction of 41 KAF at 1090' similar to Arizona and Nevada reductions.²⁸ The Minute 323 set up the BWSCP in such a way that it is triggered only after LBDCP has been implemented by the Lower Basin states.²⁸ All of the actions taken on the Water Use Reductions should be seen in the context of a goal called "Absolute Protect." As part of the LBDCP, when the August 24-Month study from the USBR projects Lake Mead to be below 1030' within two years, the parties in the Lower Basin agree to meet and come up with necessary measures to prevent Lake Mead from dropping below 1020'.^{25,29} This is a last-ditch mechanism built into LBDCP in the case of complete collapse in Lake Levels.

Lake Mead Elev.	AZ 2007	AZ LBDCP	AZ Total	NV 2007	NV LBDCP	NV Total	CA 2007	CA LBDCP	CA Total	USBR	Mexico Minute 319	Mexico Minute 323	Mexico Total	TOTAL
1090'	0	192	192	0	8	8	0	0	0	100	0	41	41	341
1075'	320	192	512	13	8	21	0	0	0	100	50	30	80	713
1050'	400	192	592	17	8	25	0	0	0	100	70	34	104	821
1045'	400	192	640	17	8	27	0	200	200	100	70	76	146	1,113
1040'	400	192	640	17	10	27	0	250	250	100	70	84	154	1,171
1035'	400	192	640	17	10	27	0	300	300	100	70	92	162	1,229
1030'	400	192	640	17	10	27	0	350	350	100	70	101	171	1,288
1025'	480	192	720	20	10	30	0	350	350	100	125	150	275	1,475

Table 3: Current LBDCP cutback plan with inclusion of Mexico Minute 323 reductions. All units in KAF (thousand acre-feet). Modified from August 2017 CAWCD presentation on Minute 323.²⁸

4.3. ICS Program Flexibility

The second component of the LBDCP was an agreement to add flexibility to the Intentionally Created Storage (ICS) program created in the 2007 Interim Guidelines. As stated above, this was a key component to getting California's buy-in of the LBDCP.¹⁹ The January 5, 2017 presentation by CAP describes four changes to the ICS rules that were confirmed in the MWD memorandum from November 8, 2016.^{15,25} They are: 1) Recovery of ICS, 2) Evaporative Losses, 3) Maximum ICS Accumulation, and 4) Annual ICS Creation Limit.

4.3.1. Recovery of ICS

According to the 2007 Interim Guidelines, agencies were prevented from recovering ICS volumes below a Lake Mead elevation of 1075'.¹ The LBDCP would allow recovery of previously deposited ICS volumes above 1045', and under certain conditions, above 1025'.^{15,18,25} This provision was particularly valuable to California because it gave them operational flexibility the previous rules did not allow.¹⁸

4.3.2. Evaporative Losses

The current 2007 Interim Guidelines assess a 3% evaporative loss each year to ICS credits when they remain in Lake Mead and the elevation is above 1075'.¹ The LBDCP would modify evaporation loss calculations. Existing ICS volumes would have no additional evaporative losses assessed after the LBDCP was implemented.²⁵ New ICS created between 2017 and 2026 would only have 3 years of evaporative losses assessed, 5% the initial year, followed by 3% then 2%.²⁵

4.3.3. Maximum ICS Accumulation

Currently 2007 Interim Guideline rules cap total ICS accumulation for Arizona, California, and Nevada at 300 KAF, 1.5 MAF, and 300 KAF respectively.¹ The new rules in the LBDCP would bump up Arizona and Nevada's caps to 500 KAF, while California would see its cap rise to 1.7 MAF. These volumes may not be directly preserved in Lake Mead, but "debited" to a state. For example, one district could pay a second district to fallow fields and the ICS credits created would go to first district even if the first district took its full annual allotment. This is a component of California's plan for the LBDCP.¹⁵ The Maximum ICS Accumulation puts a cap on a state's ability to create more than a certain amount of these "debited" ICS credits.

4.3.4. Annual ICS Creation Limit

Under the 2007 Interim Guidelines each state is prevented from creating more than a specific amount of ICS credits each year. These caps would remain in place for the LBDCP; however, if one state does not utilize its full ICS creation capacity, another state would be allowed, with permission, to use that ICS creation capacity.²⁵ Additionally, the

LBDCP would allow interstate banking to continue to occur above a Lake Mead elevation of 1045' and binational exchanges of water to continue above 1025'.¹⁵

4.4 Accounting and Recovery of LBDCP Water Use Reductions

The final component of the LBDCP deals with the management of the water savings created as part of compliance with the LBDCP initiated cutbacks proposed above in section 4.2. These water use reductions can be split into two types: 1) Drought Contingency Plan ICS (DCP-ICS) and 2) System Water.²⁵ The DCP-ICS water is required to meet a rigorous test for qualification, including qualification for what would typically be an Extraordinary ICS as described in the 2007 Interim Guidelines.²⁵ The Extraordinary ICS is primarily a reduction in existing beneficial consumptive use. ICS. In addition, existing ICS credits can be converted to DCP-ICS if they are offsetting an LBDCP reduction.²⁵ Credits created as DCP-ICS will be recoverable like in the ICS program but with more stringent rules. DCP-ICS can be recovered through 2057, but only when Lake Mead is above 1110'.^{15,25} Between 2027 and 2057, DCP-ICS credits will be recoverable if Lake Mead is above 1075', but only under two conditions. When a DCP-ICS credit is recouped either a 20% cut to the system is immediately taken or the user must return the volume of the DCP-ICS within five years.^{15,25} Finally, if Lake Mead is between 1025' and 1075', a Lower Basin State may temporarily take a portion of the accrued DCP-ICS but with the obligation to absolutely return the water by the end of the following year.^{15,25} The other category of conserved water created by the LBDCP is "System Water." This type of savings goes directly to the Lower Basin system and may not be returned to the user. It is created if the user does not create a DCP-ICS volume, the portion saved does not meet DCP-ICS standards, or the state's ICS account is full.²⁵

4.5 Intra-state Negotiations Pertaining to the LBDCP

Following the general agreement between Lower Basin principals on the LBDCP in 2016, each State and entity needed to determine how it would approach the rules outlined in the proposed LBDCP.

4.5.1 California Intra-State Negotiations

In California, as part of the development of the LBDCP a shortage sharing agreement was developed to allot reductions to the four primary users of Colorado River Water. Those four users were the Palo Verde Irrigation District (PVID), the Coachella Valley Water District (CVWD), the IID, and the MWD. Because MWD has junior priority in the California system, they recognized that they would be cutoff first and did not want that to happen.¹⁹ Therefore, they came together with the other three agencies and were able to get the others to agree to taking a portion of cutback that was proportional to the total volumes typically allotted. So, when a cutback is required each of the four districts will reduce their usage by a certain percentage of the total cutback. The numbers proposed had PVID and CVWD taking 8 and 7 percent cuts, with IID and MWD taking 60 and 25 percent cuts.¹⁹ In addition, the other three irrigation districts agreed to fallow additional land in return for reimbursement by MWD.¹⁵

4.5.2 Arizona DCP Plus Plan

Shortly after the release of the LBDCP, the Arizona Department of Water Resources (ADWR) began leading an effort to achieve a consensus in Arizona to develop the support for the legislative action needed to approve the LBDCP. This led to development of a program that would conserve even more Lake Mead water than is proposed in the LBDCP. Known as the DCP Plus, its goal was to keep Lake Mead above 1075' through 2020 by conserving approximately 400 KAF a year between 2017 and 2019.²⁵ The DCP Plus Plan conserves water through three methods: 1) Uncompensated System Conservation, 2) Compensated System Conservation, and 3) additional ICS development.²⁵ The Uncompensated System Conservation would be approximately 192 KAF/year and come from the CAP without compensation. The Compensated System Conservation would be about 410 KAF over 3 years at a cost of \$150/AF. The expenses would go to CAP Tribes, Non-Indian Agriculture, and other CAP subcontractors to forbear deliveries. The final portion of the DCP Plus Plan is an expansion of ICS through agreements with the Gila River Indian Community (GRIC) and other tribes to produce approximately 255 KAF of credits.²⁵ The availability of funding for the DCP Plus Plan was and continues to be an issue that needs resolution due to the expected \$63 million price tag.

5. Policy Discussion Section

5.1. Complications preventing LBDCP implementation

Prior to the annual Colorado River Water Users Association (CRWUA) meeting in 2016, the eventual passage of the LBDCP appeared to be inevitable. John Fleck discussed the LBDCP development in California with an eye towards official announcement at the CRWUA meeting.³⁰ Unfortunately, there was no announcement at the 2016 CRWUA or at the following year's CRWUA.³¹ Several issues have complicated the implementation of the LBDCP, focused in three areas, California, Arizona, and the Upper Basin states.

5.2. Difficulties in California

The complications arising out of California were the primary reason for the delay at the end of 2016.^{9,31} Two issues in particular held up the agreement, the Salton Sea and the Sacramento-San Joaquin Delta tunnels.³¹ The IID was concerned that any agreement to reduce water usage would also need to be met with a plan to control dust in the Salton Sea.³² The Salton Sea is a terminal lake and receives most of its inflows from the IID, so as the IID became more efficient less water flowed into the lake and it began to shrink.³³ In 2003, a 15-year agreement gave "mitigation water" to the IID to provide a buffer for the state and the IID to determine how to mitigate the impacts from the exposed lake bed of the Salton Sea.³² The current concern is that LBDCP would further reduce inflows to the Salton Sea, exposing more lakebed, and ultimately making the IID liable for air quality issues (because the own much of the lakebed land).³³

The second issue that delayed California's agreement was the MWD's need for the San Joaquin Delta tunnels (Delta tunnels).³⁴ The Delta tunnels would be constructed in the Sacramento-San Joaquin Delta where they would connect the water coming from Northern California with the Canals in Southern California via the State Water Project (of California).³⁴ Currently that water flows through the Delta, but the tunnels would bypass the Delta and make the State Water Project water more reliable. MWD would like to see the tunnels built so they have a reliable alternate sources when the LBDCP comes into effect.³⁴ At present, the Delta tunnels have been proposed, but not enacted by the state.

Finally, a recent lawsuit in the IID complicates their ability to reduce water usage. In 2013 the IID switched from a historic water rights based apportionment to a per/acre apportionment of water in order to reduce the likelihood of overruns.³⁵ A farmer in the district sued over this decision and a California State Appellate Court forced the IID to repeal this program.³⁵ With this repeal, IID has much less control over distribution of water and may have difficulty moving forward in conserving the agreed-upon volumes necessary for California to meet the goals of the LBDCP.

5.3. Difficulties in Arizona

While tentative progress was being made in California, the spirit of cooperation in Arizona quickly went south after the release of the LBDCP. In February of 2017, the CAWCD sent a terse statement to the USBR in response to an announced agreement between the USBR and GRIC that would leave the GRIC's CAP water in the lake.³⁶ CAWCD was upset by the agreement because they felt it bypassed the efforts of the multiple parties in Arizona to come together on the DCP Plus agreement, and would impinge on their authority over water management in the CAP.^{36,37} Shortly after this, in April 2017, dueling editorials were published by Mark Taylor and Alexandra Arboleda of CAWCD (who were speaking as individuals and not on behalf of CAWCD) and Tom Buschatzke of ADWR.^{38,39} These editorials publicly laid out disagreements on what water management approaches were needed to protect Lake Mead from reaching 1075'. The CAWCD board members argued for a flexibility approach that would manage water deliveries so as to keep Lake Mead in a narrow elevation band between 1073 and 1083. If correctly modeled and planned for the resulting elevation would take advantage of an operation rule from the 2007 Interim Guidelines and trigger a release of 9 MAF from Lake Powell (rather than the typical 8.23 MAF).⁴⁰ Tom Buschatzke of the ADWR publicly argued that DCP Plus Plan was the better approach to prevent a shortage on Lake Mead because it involved less risk. He also argued that the ADWR is the primary representative of Arizona on Colorado River issues which began a disagreement between the two parties that is beyond the scope of this paper and continues to this day.

5.4. Issues in the Upper Basin of the Colorado River

Finally, as the Lower Basin states were working on the LBDCP, the Colorado River Upper Basin states were simultaneously working on an Upper Basin Drought Contingency Plan (UBDCP). The UBDCP consisted of three broad goals: 1) Modification of operations of Upper Basin reservoirs

to protect Lake Powell water levels, 2) Demand management through the temporary and compensated reduction in use, and 3) Weather modification via cloud seeding.^{8,41} This plan is relatively broad compared to the LBDCP, but as John Fleck mentioned in an interview conducted for this paper, the hydrologic situation of the Upper Basin states requires more flexibility. Whereas the Lower Basin controls most of its water through a single point (Lake Mead), the Upper Basin has numerous water sources with users distributed throughout the headwaters. A simple command and control agreement could not capture the complexity of this system.¹⁴ Another issue is over the question of Federal legislation. Theoretically the LBDCP and UBDCP should work in a coordinated fashion, but how this will work is still unknown. According to Daniel Rothberg in his March 2018 piece for the Nevada Independent, there is a growing consensus that Federal legislation will be needed to enact the entire LBDCP and UBDCP plans.⁴² The prospect of Federal legislation opens a Pandora's box of potential other measures going into a Federal authorization as Eric Kuhn of the Colorado River District wrote in his memo to the water district's board.⁴³ Lastly, a recent dust-up over the narrow-range management of Lake Mead levels by CAWCD has exploded into public disagreement. An infographic showing what the CAWCD called the "sweet spot" described their attempts to keep Lake Mead within the narrow range previously discussed.^{44,45} The Upper Colorado River Commission accused the CAWCD of disregarding the Colorado River Basin's "dire situation", and Denver water threatened to pull funding from conservation measures like the PSCP.⁴⁴ This in turn led to nearly all the parties in the Colorado River Basin to condemn the CAWCD actions, which while technically legal, appeared to violate the spirit of cooperation. CAWCD responded by attending an Upper Colorado River Commission on April 30th 2018 to discuss the issue at hand.⁴⁶ Following the meeting CAWCD did issue an apology for their rhetoric and a spokesperson for CAWCD said the agency "resolves to have a more respectful and transparent dialogue in the future".⁴⁷

6. Conclusion

Given the continuing nature of the LBDCP negotiations it is difficult to recommend specific policy negotiations. In conducting interviews for this paper each respondent agreed that the rules laid out in the LBDCP could be rolled into the next set of negotiations for the development of post 2026 Interim Guidelines.^{9,14,19} This represents a collaborative consensus to respond to a serious structural deficit in the Colorado River Lower Basin. It shows the effectiveness of the current management network that has developed throughout the Colorado River system. Although it has had difficulty reaching a point of adoption, the mere fact of the LBDCP's existence rather than a legal battle in the courts is an indication of the magnitude of change that has occurred in interstate management of the Colorado River since the Supreme Court fights of the 1960's.

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