

ARKANSAS RIVER COMPACT ADMINISTRATION

Lamar, Colorado 81052

For Colorado

Chairman and Federal Representative

For Kansas

James Eklund, Denver
Colin Thompson, Holly
Scott Brazil, Vineland

Vacant

David Barfield, Topeka
Randy Hayzlett, Lakin
Hal Scheuerman, Deerfield

December 1, 2014

Mr. Hal Scheuerman, Chairman
Mr. Colin Thompson, Member
Operations Committee
Arkansas River Compact Administration

Re: Compact Year 2014 Summary
Assistant Operations Secretary Report

Gentlemen,

In this report, I will provide my perspective as Assistant Operations Secretary on operations that have occurred over the past Compact Year (CY), including communications, the Pueblo Winter Water Storage Program (PWWSP), Kansas Reservoir Call, Pass-thru & Status Accounting, Water Issues Matrix, and Presumptive Depletion Factor (PDF) Evaluation.

Communications

The Operations Secretary, Assistant Operations Secretary, and their respective staff have set a goal of open and frequent communications regarding Arkansas River operational issues to foster a positive, collaborative, and productive working relationship. We continue to work on achieving this goal.

Meetings: In CY 2014 the OS and AOS had the following meetings:

- February 26 – OS, AOS, their staffs, and Hal Scheuerman, Kansas Compact Representative met in Lamar, Colorado. The discussions centered on the PWWSP.
- June 10 – OS, AOS, their staffs, and Hal Scheuerman, Kansas Compact Representative met in Lamar. Various issues were discussed.
- November 14, 2014 – meeting in Pueblo attended by the OS, AOS, their staff, and Colin Thompson, Colorado Compact Representative. The discussions centered on the three (3) Kansas account water releases, with the first release being the primary topic. See discussion below.

Regular Communications: The States communicated throughout the year on a variety of topics including John Martin Accounting System (JMAS) data updates, PWWSP operational issues, John Martin Reservoir (JMR) permanent pool deliveries, Offset Account operations, and runoff conditions within the Arkansas River Basin.

As issues arose, they were communicated to the Division 2 office. This report will have a couple of specific instances noted below. An additional item arose during the writing of this report concerning the Kansas release accounting which was communicated as I worked through the issue via three emails over a period of four days. In the end, I determined that there was no issue that needed to be resolved, which was also communicated.

Deliveries to Kansas

The below JMR river conditions in June had improved compared to the 2012 and 2013 conditions. Figure 1 and Figure 2 show the mean daily flows for the Arkansas River near Granada and at the Stateline. With these improved conditions, the decision was made to call for the available account water stored in JMR.

We coordinated with Colorado Division 2 staff on this release starting on June 25th (Wednesday). Three items discussed were: (1) the calling of Section II Account water first, allowing the concurrent release from the Transit Loss Account; (2) the amount of Transit Loss Account water to be released concurrently with the Kansas Section II Account water; and (3) calling at a rate that would keep the release within the primary banks of the river such that water would not spread-out thus increasing the transit loss. During this same time we informed the Kansas USGS section of the impending release, including the need for a streamflow measurement the following week.

The account release was interrupted twice due to precipitation runoff events occurring below JMR, resulting in three separate releases. Compact conservation and Amity Great Plains storage extended the Kansas release duration beyond what was initially expected. The three releases are described below.

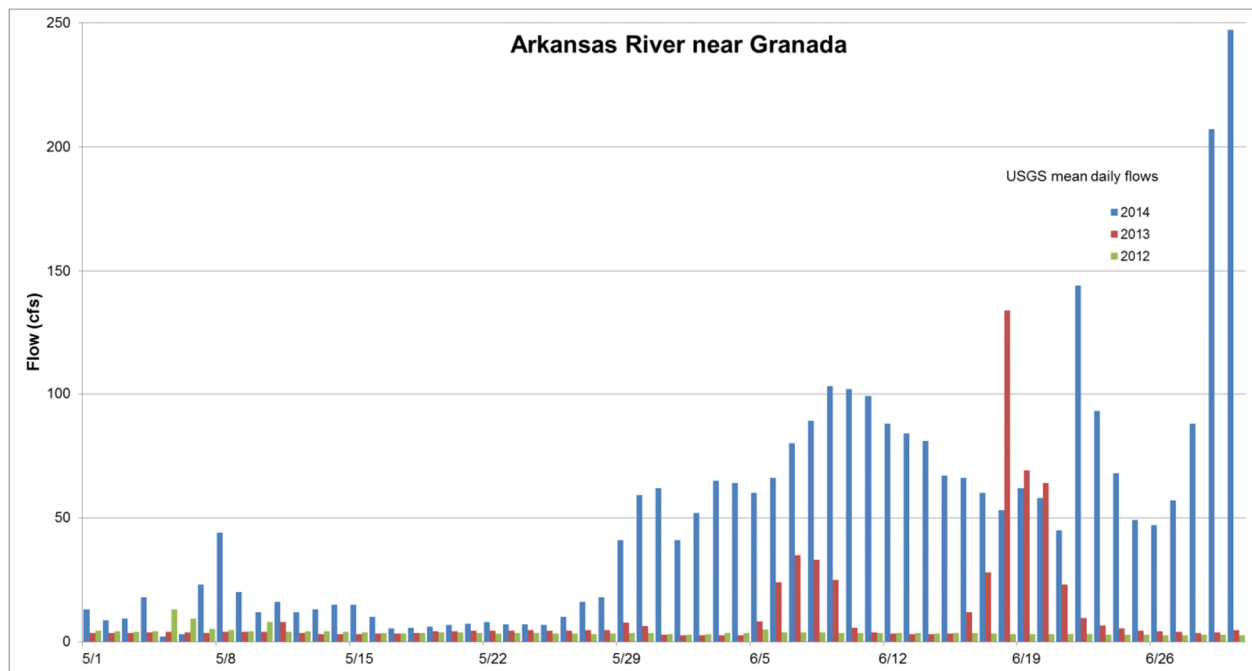


Figure 1 Mean daily flow of the Arkansas River near Granada for May and June

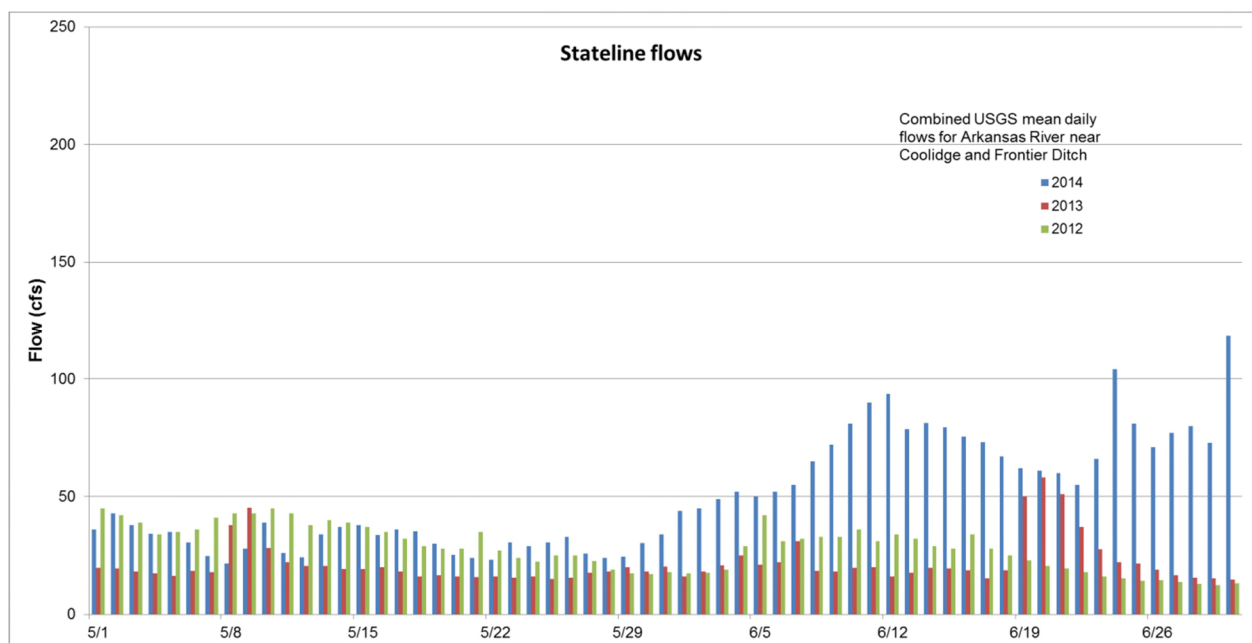


Figure 2 Stateline mean daily flow for May and June

Kansas Run/Release 1: On June 27th Kansas requested a 450 cfs release from the Kanas Section II and Transit Loss Accounts. The desired release from Kanas Section II was 350 cfs, but the State staffs determined a 450 cfs total release rate would stay within the primary channel. The release was front loaded with Transit Loss Account water: 250 cfs from the Kansas Section

II and 200 cfs from the Transit Loss Account. The Section II release rate was increased and Transit Loss Account release was decreased over a period of days. See Table 1.

Table 1 Kansas Section II Account and Transit Loss Account releases during first Kansas release

date	Kansas Section II (cfs)	Transit Loss (cfs)	Total (cfs)	Kansas Section II (af)	Transit Loss (af)	Total (af)
6/27	250.0	200.0	450.0	495.88	396.7	892.6
6/28	250.0	200.0	450.0	495.88	396.7	892.6
6/29	300.0	150.0	450.0	595.05	297.5	892.6
6/30	350.0	100.0	450.0	694.23	198.4	892.6
7/1	350.0	79.1	429.1	694.23	156.9	851.1
7/2	350.0		350.0	694.23	0.0	694.2
7/3	350.0		350.0	694.23		694.2
7/4	350.0		350.0	694.23		694.2
7/5	350.0		350.0	694.23		694.2
7/6	350.0		350.0	694.23		694.2
7/7	350.0		350.0	694.23		694.2
7/8	350.0		350.0	694.23		694.2
7/9	350.0		350.0	694.23		694.2
7/10	350.0		350.0	694.23		694.2
7/12	350.0		350.0	694.24		694.2
7/13	350.0		350.0	694.24		694.2
7/14	167.7		167.7	332.65		332.7

Kansas staff monitored the release as it progressed from JMR. On June 29th (Sunday), I noted the Arkansas River flow at Lamar was higher than expected. Reviewing the JMR release, diversions, and augmentation flows between JMR and Lamar, I found a gain of 41 cfs. Given the river and general hydrologic conditions at that time, significant flow loss was expected. I concluded that the flow readings shown for the USGS gage at Lamar were in excess of what was actually present. This was communicated to Mr. John Van Oort with the Colorado Division 2 by email and telephone conversation that same Sunday. Mr. Van Oort contacted Bill Payne, USGS, for measurements below John Martin Reservoir on Monday. Mr. Van Oort noted that Granada would be measured either Tuesday afternoon or Wednesday morning.

When the release arrived at Granada, we noted a similar problem, that the gage was showing flows in excess of what was actually present. It was confirmed that the USGS gages at Lamar and Granada were showing more flows than what was actually present once the USGS made measurements at these sites. When these measurements were applied to the rating curves, we saw a significant decrease in the amount of flow being measured at those sites. See Table 2.

Table 2 USGS flow measurement information

Location	Date & time	Flow measured by USGS (cfs)	Flow before adjustment ¹ (cfs)	difference (cfs)
Lamar	2014-07-01 18:13	388	544	(156)
Granada	2014-07-01 15:20	265	429	(164)
Coolidge	2014-07-08 09:30	205	331	(126)

The leading edge of this release arrived at the Stateline approximately two days after the release was started at JMR as was expected. However, the release built slower than normally seen in past releases. The Stateline flow stabilized around July 5th or 6th (Saturday or Sunday). Again, it was determined that the flows were actually lower than what was being shown at the Coolidge gage. Besides reviewing the known diversions and inflows, we also had the flow measurements and subsequent rating shifts made by USGS at both Lamar and Granada. When the USGS measured the Arkansas River near Coolidge on July 8th (Tuesday), they found that this gage was also giving readings in excess of actual flows. To correct for this error, a significant shift was applied to this site. See Table 2.

The release was stopped on July 15th at 11 am MDT due to a precipitation-runoff event.

The States are not in agreement on this first release of Kansas Section II Account water. The disagreement stems over the use of provisional data that is known to be incorrect by both States and was reported as incorrect in a timely manner. As discussed above, we knew that the flows being shown at the USGS gage sites between JMR and the Stateline were in excess of the actual flows. This was confirmed with the USGS flow measurements at Lamar, Granada, and Coolidge.

The Colorado accounting uses this faulty provisional data for the entirety of the first Kansas release. The initial Kansas accounting replaced the provisional data for the period it was known to be incorrect with corrected flows based on the USGS measurements. The Kansas accounting used the provisional data after July 8th. Charts showing the release as determined by each State are in Figure 3 and Figure 4.

¹ Fifteen minute data as captured by Colorado and is unchanged by subsequent rating shifts applied.

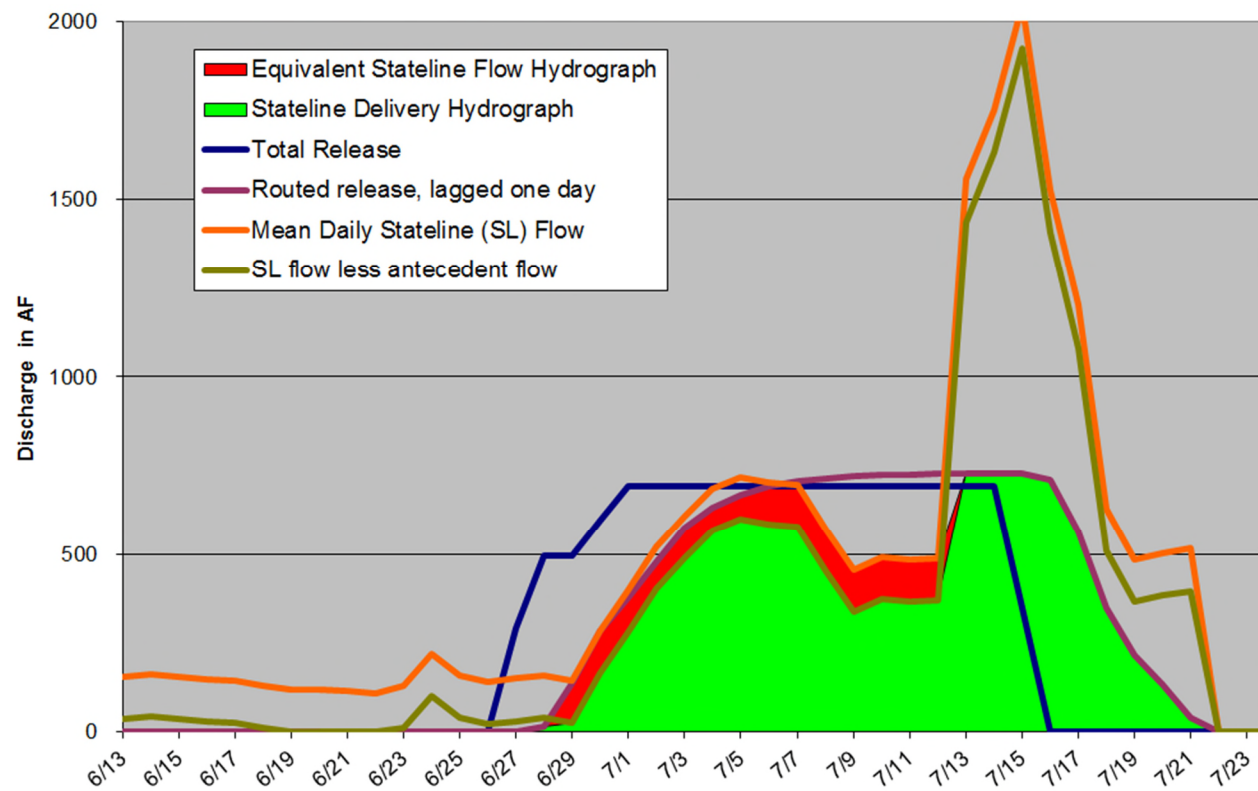


Figure 3 Colorado Release 1 hydrograph using provisional data

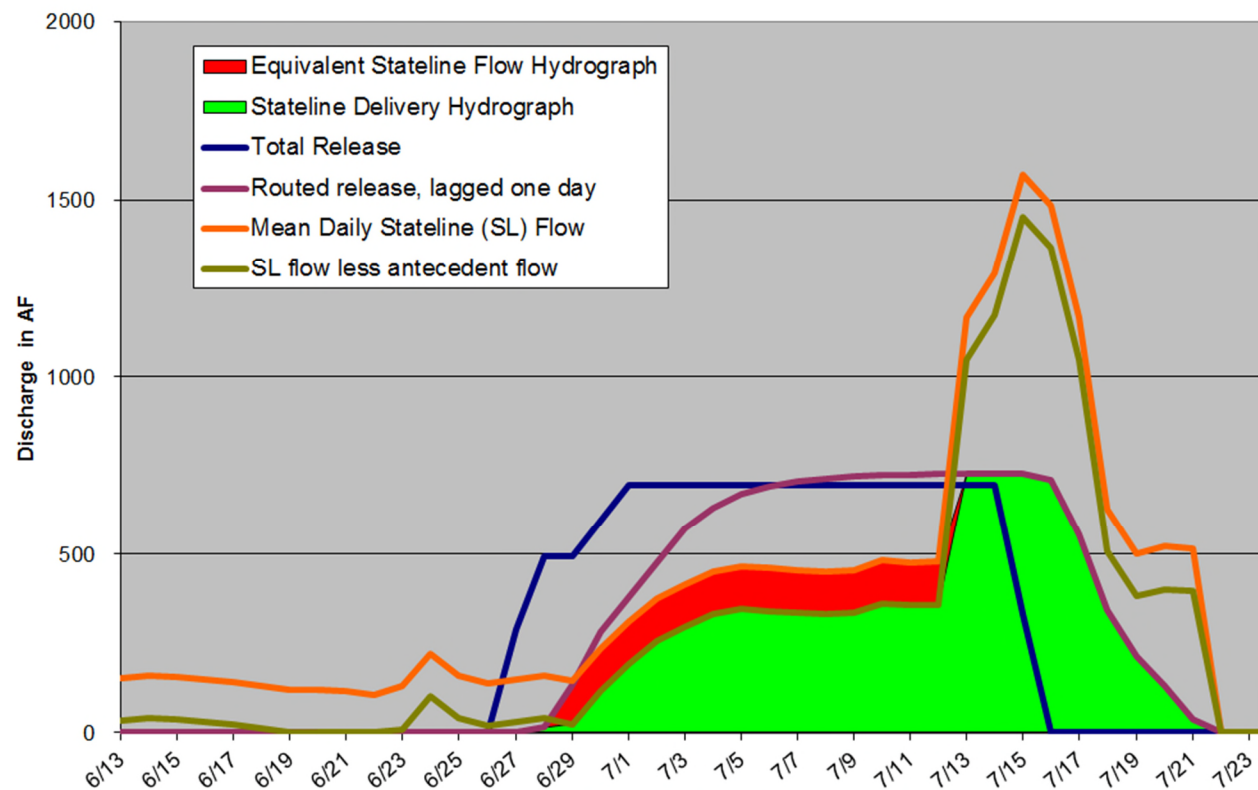


Figure 4 Kansas Release 1 hydrograph using corrected flow data to July 8th and provisional thereafter

To determine whether or not there has been a delivery deficit on a Kansas Section II Account release, the States use the “Agreement on Determination of Transit Loss under the provisions of Section II E (4) of the Resolution Concerning an Operating Plan for John Martin Reservoir as revised December 2006” (Section II Agreement). Section B.iii of this agreement has the following provision concerning the use of provisional data:

Provisional data shall be used for all the calculations described in this agreement. Corrections for data omission, erroneous hourly measurements or mechanical errors *discovered in a timely manner* and not due to *merely* a shift change made by USGS following a subsequent measurement should be included in the provisional data. (*emphasis added*)

The Kansas release was initiated on Friday morning June 27th and as noted above, the issue of gaged flow at Lamar being in excess of actual flow was communicated to Colorado Division 2 staff on Sunday June 29th. During the next week, I communicated with Colorado Division 2 staff about the problem of inaccurate flow readings at Granada and Coolidge. This discussion included my coordination with the Kansas USGS field office on the measurement of the Arkansas River near Coolidge.

When USGS made measurements at Lamar, Granada, and Coolidge, significant changes to the ratings at these sites were found. When the Section II Agreement was being negotiated, it was anticipated that the use of provisional data might result in discrepancies with the corrected data on the order of tens of acre feet. I would note that the language used in the provision above uses “merely” suggesting that significant changes to the ratings should be corrected. The language could have as easily said “...and not due to a shift change made by USGS...”.

In the process of drafting this report, Kansas decided to present a third alternative of using the USGS corrected data for the entire first Kansas release. Table 3 below shows these three different accountings of the first release based on different data being applied. The difference in the delivery deficit between the provisional and corrected data is 1,380 AF (2,092 minus 712).

In writing the Section II Agreement, the States desired to be very explicit on the data to be used. As Colorado does its water administration based on provisional data, Kansas was agreeable to use this same data for delivery determinations based on the understanding that the differences between provisional and corrected data would be minor, if any. We believe the provision noted above precludes the use of provisional data which suffers from this level of inaccuracy, when the errors are reported on a timely basis.

Table 3 - Release 1 comparison of Kansas Section II Account release using provisional and corrected data

	Colorado	Kansas	Kansas	difference
Streamflow data type	Provisional	Corrected/ Provisional	Corrected	
Kansas Section II Account release	11,928 AF	11,928 AF	11,928 AF	
ESF Delivery Efficiency	94%	82.5 %	82.5 %	
Section II Delivery	11,230 AF	9,836 AF	9,836 AF	
Section II Delivery Transit Loss	712 AF	2,092 AF	2,092 AF	1,380 AF

Kansas Run/Release 2: Kansas initiated the second Kansas Section II Account release of 350 cfs on July 17th at 11 am MDT. Given the lack of performance at the Stateline of the first release, Transit Loss Account water was released concurrently with Kansas Section II Account water. This release was stopped on July 30th at 1 pm MDT due to a precipitation runoff event. Table 4 shows the differences in the accounting methods for this release.

The States are in agreement with the Kansas Section II Account delivery using provisional data. Table 4 compares using the provisional data to the corrected data as downloaded on November 5th. There is no delivery deficit using the corrected data.

Table 4 - Release 2 comparison of Kansas Section II Account release using provisional and corrected data

	Colorado	Kansas	difference
Flow data type	Provisional	Corrected	
Kansas Section II Account release	9,025 AF	9,025 AF	
ESF Delivery Efficiency	96.1%	100 %	
Section II Delivery	8,671 AF	9,025 AF	
Section II Delivery Transit Loss	354 AF	0 AF	(354) AF

Kansas Run/Release 3: Kansas initiated the third release on August 1st at 9:30 am Mountain. Kansas called for 350 cfs to be released from the Offset Account. The Offset Account was effectively exhausted on August 7th and the release was continued with a 350 cfs from the Kansas Section II Account. Given the lack of performance at the Stateline of the second release, Transit Loss Account water was released concurrently with the Kansas Section II Account water release. This release was stopped when the Kansas Section II Account was exhausted on August 9th at 10:34 pm MDT. Table 5 shows the differences in the accounting methods for this release.

The States are in agreement with the Kansas Section II Account deliver using provisional data. Table 5 compares using the provisional to the corrected data as downloaded on November 5th. There is no delivery deficit using the corrected data. The accounting for the Offset Account portion of this release is also changed as shown in this table.

Table 5 – Release 3 comparison of Kansas Section II Account and Offset Account release using provisional and corrected data.

	Colorado	Kansas	difference
Flow data type	Provisional	Corrected	
Kansas Section II Account release	1,583AF	1,583AF	
ESF Delivery Efficiency	96.1%	100 %	
Section II Delivery	1,521 AF	1,583AF	
Section II Delivery Transit Loss	62 AF	0 AF	(62) AF
Offset Account released			
- consumable	3,390 AF	3,390 AF	
- nonconsumable	952 AF	952 AF	
Offset Account delivery efficiency	80.5%	94.6 %	
Offset consumable net delivery	2,728 AF	3206 AF	(478) AF

In summary, Kansas made three releases from the Kansas Section II and Offset Accounts. The States are not in agreement for the first release because of the use of provisional data that was known to be incorrect. The errors in the provisional data were timely communicated, and the change in rating curves for the Arkansas River near Lamar, Granada, and Coolidge was significant. The intent of using provisional data was to reduce disputes, but under this summer's river conditions it created a dispute because it was recognized early that the provisional data was very far from accurate.

Corrected data was used to compare the delivery results for the second and third releases. It was found that the corrected data would impact the results of these two releases as well.

After reviewing the delivery accountings for this year, it is my recommendation that corrected flow data should be used for all Kansas releases, thus accurately reflecting what actually occurred. Since the agreements used to determine Kansas deliveries at the Stateline are between the Kansas Chief Engineer and Colorado State Engineer, I recommend that the Operations Committee add the issue of using corrected USGS data for Kansas releases' to the Water Issues Matrix and then immediately refer to ARCA's Special Engineering Committee.

Pueblo Winter Water Storage Program

Kansas continues to have its long standing concern regarding how the split between the Compact conservation storage and PWWSP water passing through the Arkansas River at Las Animas USGS gage is determined. This is Issue 22 on the Water Issues Matrix. While both States have spent considerable time evaluating this issue, it has not been resolved. PWWSP issues have held up approval of the Operations Secretary's annual reports since 2006.

Our concern is whether the split methodology allows water to be stored under PWWSP that should have been stored in Compact conservation storage. The determination of the split

between Compact conservation storage and PWWSP at the Arkansas River at Las Animas gage seems subjective and it raises questions such as whether it is subject to manipulation, e.g. by upstream ditch operations during the November 1st to November 14th period which reduce flows at that gage.

Additionally, in 2009 we noted a drop in the Purgatoire River near Las Animas gage between November 14th and November 15th. This raised a question of whether water was being passed around the Arkansas River at Las Animas gage. In reviewing the flow history of the Purgatoire River near Las Animas gage, this has occurred but not consistently and to varying degrees. Starting in November 2010, we have tried to visit the Consolidated Ditch on or before November 14th to determine whether the wasteway to the Purgatoire River is being used.

Another concern is the 2007 condition where a significant snowpack was present on the Las Animas Consolidated service area through a large part of the PWWSP storage period. Water would not have been diverted onto those lands during those times and that water would have likely been stored in Compact conservation storage absent the PWWSP.

CY2014 PWWSP: Figure 5 shows the Arkansas River at Las Animas flow, the Compact water stored in John Martin, and the Compact ratio from November 1, 2013 thru March 31, 2014. The PWWSP period is from November 15th through March 14th each year. This period presented several difficulties. Both States were in close communication during this period to deal with operational changes and ice impacted gaged flows. As seen in this figure, the Compact share of the Arkansas River at Las Animas varied greatly during this period.

Both States are reviewing pre and post PWWSP years to determine whether there have been any changes to the gross diversions. Additionally, guidelines are being developed for how the split between Compact conservation storage and the PWWSP is initially determined and is changed due to subsequent operational changes.

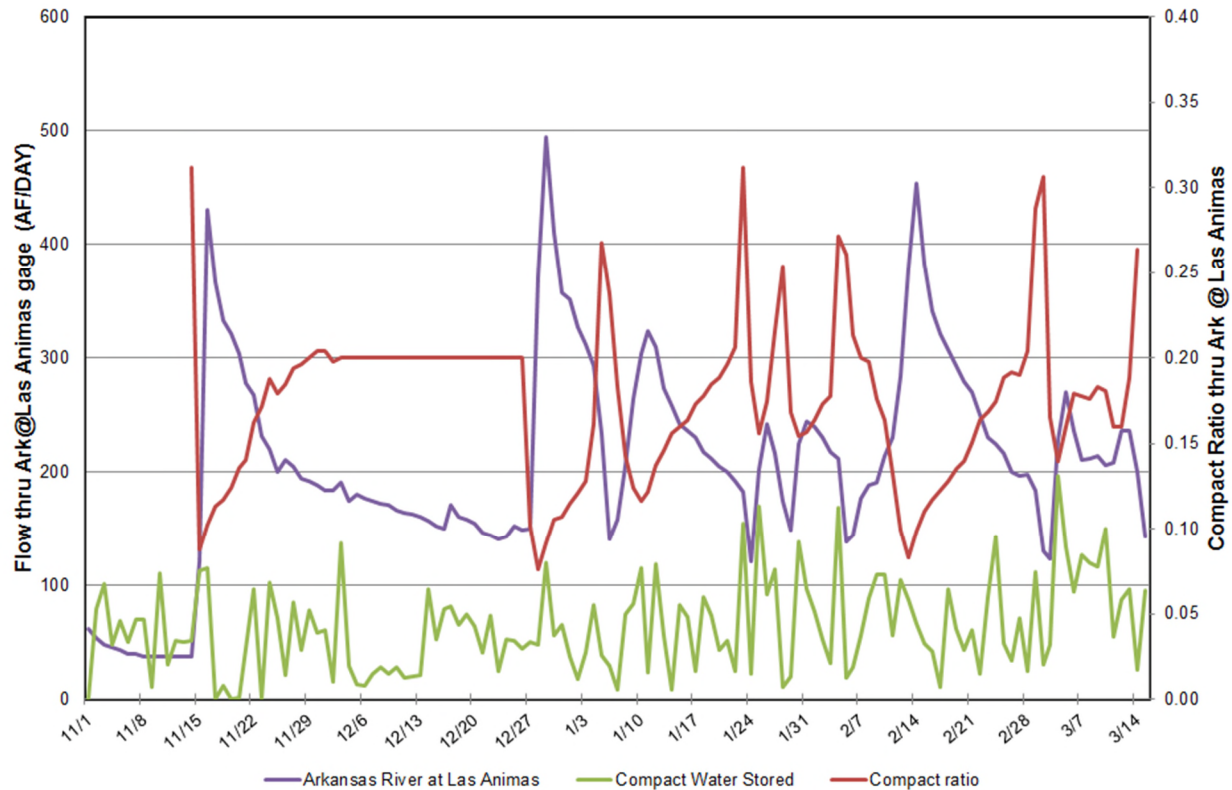


Figure 5 Arkansas River at Las Animas and Compact Conservation storage for the period of November 1, 2013 to March 15, 2014 and the Compact ratio of the Arkansas River at Las Animas flows for the period of November 15, 2013 to March 14, 2014.

CY2015 PWWSP Although we scheduled a visit to the Consolidated on November 14, 2014, to review operations with Division 2 staff, we didn't visit given that the Consolidated has ceased diversions on the previous Monday and poor road conditions.

Pass-thru and Status Accounting

JMR daily inflow, storage, and outflow were tracked by the Garden City Field Office staff for CY2014. A pass thru spreadsheet was first provided to the Operations Secretary on November 17th for inclusion in the Operations Secretary's report. This spreadsheet tracks the amount (AF) of river flows; JMAS inflow & release; reservoir evaporation, storage, and release.

The information in this spreadsheet was regularly updated and reviewed by the Garden City Field Office staff. The spreadsheet uses the tracked information to calculate: (1) gaged and ungaged inflows, (2) pass-thru, and (3) the reservoir "status." The pass-thru represents that amount of JMR inflows which are not stored in any account and are released on downstream. The reservoir "status" represents the difference between the amount considered stored in JMAS and the amount shown as stored in JMR.

Water Issues Matrix

This is a joint work product of the States which is designed to track various disputed issues. These disputed issues are primarily concerned with JMR related operations and accounting. Approximately half have been resolved through the efforts of this Committee and others. The matrix currently has 35 issues, of which 12 are pending resolution, four (4) have been removed or suspended, and 19 have been resolved. The current versions of the matrix and issues summary table are attached to this report.

Potential changes to this matrix as the result of actions taken during these committee and annual meetings:

- Steve Witte has provided language to address Issue 27 by an email of November 10, 2014 which should be considered, and
- the addition of the use of provisional data for measuring Kansas deliveries.

Summary

The States are not in agreement on the first release of Kansas Section II delivery. After comparing the use of provisional to corrected data, I have recommended that corrected USGS flow data be used for any Kansas release. I ask that the Operations Committee add this to the Water Issues Matrix and refer this particular issue to the Special Engineering Committee.

Regarding the PWWSP, both States continued their efforts to review this program in this past Compact year. Progress should continue in this Compact year in both determining PWWSP impacts, if any, and the development of guidelines to be used in determining the split between Compact conservation and PWWSP storage in John Martin Reservoir.

I look forward to working with the Operations Secretary and his staff on these and the day-to-day operations of the Arkansas River.

Sincerely,



Kevin L. Salter, P.E.
Assistant Operations Secretary

Attachments

Water Issues Matrix

Pending JMR Accounting Issues	2
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11 – Removed	2
12 – Consideration of new sources for permanent pool water – remaining Muddy Creek Storage Right	2
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20 – Resolved.....	3
21 – Resolved.....	3
22 – Criteria for determining Section III storage under the Pueblo Winter Water Storage Program (PWWSP)	3
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24 – Utilization of “Summer storage season” as defined by the 1980 Operating Plan...	5
25 – Criteria for Summer storage event trigger – Section II. B 1	5
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Pending JMR Accounting Issues

10 – Resolved -- Permanent Pool evaporation charges calculated by pro rata volume vs. incremental area
11 – Removed -- Transfer of Account water to Permanent Pool during flood control operations in JMR

12 – Consideration of new sources for permanent pool water – remaining Muddy Creek Storage Right	
<i>ARCA Committee</i>	Engineering
<i>Issue Category & Priority¹</i>	B – 8
<i>Legal² – Policy³ – Technical⁴</i>	Policy
<i>Kansas Staff Position</i>	<i>Colorado Staff Position</i>
<i>Kansas Staff Comments</i>	<i>Colorado Staff Comments</i>
<i>ARCA Committee or other general comment(s)</i>	
<p>Related to transfer of the remaining Muddy Creek Storage Right proposal:</p> <ul style="list-style-type: none"> ▪ In June 2012, Grady McNeill suggested that they would bring a proposal to transfer the remaining 8,425 AF to the JMR permanent pool ▪ In October 2012, Grady McNeill forwarded a proposed resolution to transfer the remaining portion ▪ On 14 November 2012, CO Div 2, John Tonko, and KS DWR staff visited the Muddy Creek Reservoir, Muddy Creek and Rule Creek gage sites ▪ December 2012: xxx <p>Related to the Keesee proposal:</p> <ul style="list-style-type: none"> ▪ LAWMA made a conceptual proposal at the December 2005 ARCA Annual Meeting ▪ LAWMA provided additional detail for this proposal in February 2007 ▪ Informal discussion between Kansas, LAWMA and Colorado ▪ A timeline for discussion between Kansas & LAWMA was established at 2007 ARCA Annual meeting. ▪ David Barfield letter (26 December 2007) ▪ Matt Heimerich letter (January 7, 2008) ▪ David Barfield provided a list of discussion items (email Jan 18, 2008) ▪ Discussion between Barfield & Heimerich on proposal (call Feb 5, 2008) ▪ Email from Matt (Feb 5, 2008) to Colorado team / Barfield agreed to provide a list of LAWMA Colorado Water Rights for use as a source for the permanent pool ▪ LAWMA withdraws its request by letter dated (letter July 1, 2008) ▪ LAWMA has an obligation to provide a source of water for the JMR Permanent Pool, so this issue remains active ▪ David Barfield provides to Matt Heimerich principles that would guide Kansas evaluation (letter dated Nov 25, 2008) 	

¹ Categories: **A** – capable of resolution; **B** – may need to be addressed by an ARCA Committee other than Operations; and **C** – staffs have taken this issue as far as they can. The priority based on two groupings “A” issues and “B & C” issues. From memos dated 5 Feb 2004 and 19 August 2004 (Witte & Rude)

² **Legal** is defined as an issue that is not resolvable at this time or within ARCA

³ **Policy** is defined as an issue that needs to have input or guidance from either Operations Committee or ARCA

⁴ **Technical** is defined as an issue that can be resolved by the respective State staffs

13 – Removed -- 1980 Operating Plan’s Restriction on use of Section III related to Perm Pool
20 – Resolved -- Winter Water Account of convenience
21 – Resolved -- Timely distribution of Section III storage charge during Pueblo Winter Water Storage Program (PWWSP)

22 – Criteria for determining Section III storage under the Pueblo Winter Water Storage Program (PWWSP)	
<i>ARCA Committee</i>	Operations
<i>Issue Category & Priority</i>	A – 4
<i>Legal – Policy – Technical</i>	Legal 1 st / Technical 2 nd
<i>Kansas Staff Position</i>	<i>Colorado Staff Position</i>
The criterion used by Colorado fails to adhere to what was established under the 1980 Operating Plan, specifically: “The Amity may store such water as it could otherwise divert from the Arkansas River for storage in the Great Plains Reservoir system ...” (Section III.A.) and for the Fort Lyon and Las Animas Consolidated they may deliver water under the PWWSP but “the delivery cannot include water that otherwise would have accumulated in conservation storage” (Sections III.B. and C.).	The criteria used to divide inflow to JMR into conservation storage/Section III is not provided in the 1980 Operating Plan, but has been continuously used. Since KS did not prove PWWSP caused injury, CO is reluctant to change.

<i>Kansas Staff Comments</i>	<i>Colorado Staff Comments</i>
<p>ARCA should establish criteria for determining the water available for Section III storage in JMR to protect inflows to conservation storage. Water delivered to JMR under the PWWSP should not include water that otherwise would have accumulated in conservation storage.</p> <p>In 2007, a snowpack covered SE Colorado that would have prevented direct irrigation. This snowpack may have impacted off-channel storage as well.</p> <p>In 2008, 2009, & 2010, drops in flow between November 14th and 15th on the Purgatoire River near Las Animas appear to be related to the Las Animas Consolidated operations were noted. In reviewing the flow history of this gage site, there appears to be other occurrences prior to 2008.</p> <p>In response to noting the flow drops, the Las Animas Consolidated was visited with Division 2 staff in Nov 2010. We didn't observe any significant returns to the Purgatoire above the USGS gage, nor did we note any other significant returns to the Ark River below the Ark River at Las Animas gage. Additional visits with Colorado Div 2 staff in November, 2011 & 2013 have occurred: we found returns below the Ark @ Las Animas gage consistent with irrigation operations and the wasteway above the Purgatoire River at Las Animas gage not being used during our visits.</p> <p>In November 2011, Salter developed a spreadsheet to gage impacts of changes to the Ark @ Las Animas split between the Compact and PWWSP.</p> <p>In November 2012, we scheduled a visit to the Consolidated but didn't visit given the hydrologic conditions, dry Purgatoire River at the USGS gage and no water being used east of the highway as noted as we traveled to the breached Muddy Creek Reservoir site.</p>	<p>Colorado consideration of changes may occur.</p>
<i>ARCA Committee or other general comment(s)</i>	
<p>The Operation Secretary and the Assistant Operation Secretary should continue to work on this issue (10 May 2002).</p>	

23 – Resolved --Reporting of Winter Water vs. Winter Compact storage split calculation

24 – Utilization of “Summer storage season” as defined by the 1980 Operating Plan	
ARCA Committee	Operations
Issue Category & Priority	
Legal – Policy – Technical	
Kansas Staff Position	Colorado Staff Position
The 1980 Operating Plan defines the "Summer storage season shall be the period of time commencing at the first exhaustion of conservation storage and continuing to and including the next succeeding October 31."	
Kansas Staff Comments	Colorado Staff Comments
The 1998 Operations Secretary's Annual Report notes that the Operations Secretary deviate from ...	This is an aspect of Kansas' complaint regarding Agreement B (Issue # 60), not a separate issue and therefore should be removed.
ARCA Committee or other general comment(s)	

25 – Criteria for Summer storage event trigger – Section II. B 1	
ARCA Committee	Operations Committee
Issue Category & Priority	na
Legal – Policy – Technical	technical
Kansas Staff Position	Colorado Staff Position
ARCA needs to address Section II. B (1) with respect to determination of “existing irrigation requirements” for ditches that no longer engage in irrigation. Also the criteria related to how the 1,000 AF over then existing irrigation requirements is applied.	Colorado law defines the extent of a water right based on historical use. Water rights submitted for adjudication of changed uses must meet standard of non-injury to other water users. This issue may be resolved by striking the word “irrigation” from the phrase quoted at left. The 1980 Operating Resolution should also be amended to add the words “per day” to follow “1000 AF”, to resolve the second concern
Kansas Staff Comments	Colorado Staff Comments
In general, this appears to be primarily a technical issue and we need to discuss the mechanics of how to quantify the “then existing irrigation requirements.” This issue does have some relationship with Issue 26	
ARCA Committee or other general comment(s)	

26 – Section II limitations on use made of account water to irrigation only	
ARCA Committee	Operations Committee
Issue Category & Priority	na
Legal – Policy – Technical	policy &/or legal
Kansas Staff Position	Colorado Staff Position
Use of Section 2 account water for uses other than irrigation is not allowed unless approved by ARCA. Such approval should be conditioned such that the historic flow regime of the river under irrigation is maintained and would be done on a case-by-case basis.	Colorado is not aware of any restrictions on the use of water stored in the respective Section II accounts of Kansas or the Colorado Water District 67 ditches. Water stored in the Section II accounts has been used to replace depletions from well pumping for many years without objection by Kansas.
Kansas Staff Comments	Colorado Staff Comments
Both the Compact and the 1980 Operating Plan are predicated on irrigation use. Any changes need to maintain the flow regime of the river as if irrigation was the only use of the water. ARCA has governance over operations of John Martin Reservoir, including storage accounts created under the 1980 Operating Plan. Any deviations from irrigation operations need to have those operations approved by ARCA so that the flow regime of the river can be maintained.	
This issue does have some relationship with Issue 25.	
ARCA Committee or other general comment(s)	
xx	

27 – First reference to Section II in Section III (A)	
ARCA Committee	Operations Committee
Issue Category & Priority	na
Legal – Policy – Technical	Policy
Kansas Staff Position	Colorado Staff Position
The language in Section III.A is not consistent with other provisions of the 1980 Operating Plan. For example, Section II.G where water stored in Section III.A is called to spill specifically before the Section II account water.	The reference granting Amity permission to “store such water as it could otherwise divert for storage in the Great Plains Reservoir system in its account granted in Section II ” (emphasis added) appears to be inappropriate and is contrary to longstanding practice.
Kansas Staff Comments	Colorado Staff Comments
xx	xx
ARCA Committee or other general comment(s)	
<ul style="list-style-type: none"> Added to matrix at direction of Operations Committee in Dec 2009 	

30 – Resolved -- Determination of transit loss under Section II(E)(4)
31 – Resolved -- Sections II (E)(4) and III (D) are unclear as to where transfers to make up deficits should be made
32 – Resolved -- How should transit loss account be used?

33 – Transit loss on reservoir-to-reservoir deliveries	
ARCA Committee	Operations Committee
Issue Category & Priority	na
Legal – Policy – Technical	Technical
<i>Kansas Staff Position</i>	<i>Colorado Staff Position</i>
Given Livingston's assumptions regarding the nature of the transit loss and other river operations that could consume "unconsumed" transit loss, the credited delivery for unconsumed transit loss to John Martin is too large. If there is an unconsumed transit loss portion that can be recovered, then the accounting for that portion should correspond with actual timing of when it is delivered to the JMR.	The 1978 Livingston Report provides a sound and reasonable basis for determining transit losses and should be relied upon until improved by a subsequent study.
<i>Kansas Staff Comments</i>	<i>Colorado Staff Comments</i>
<p>Kansas' basis described in 12/1/07 AOS Report to ARCA Operations Committee, pg. 6-10. From that report:</p> <p>"The Livingston 1978 Report notes that the transit loss model simulates response during steady-state conditions and that during un-steady state condition the transit losses are approximations. Tributary inflows, canal diversions, or water table conditions are listed as factors that would affect transit losses (page 21 of Livingston 1978 Report). The report also notes that conditions that are significantly different from the conditions that existed at the time of the calibration release (Sept 1975) would also affect the accuracy of the transit loss estimation.</p> <p>In addition, Livingston 1978 Report noted an administrative decision was made by the Colorado State Engineer and the Southeastern Colorado Water Conservancy District for reservoir to headgate transit loss determinations. It was noted that some of the bank storage would return for an extended period, particularly for water that is temporarily stored in the river banks. This decision appears to reflect the difficulty in distinguishing water that was part of a release from natural flow soon after the end of the release."</p> <p>Based on the above, it appears that other river operations may result in the delay of the unconsumed portion return to the river, or in the diversion and/or consumption of the unconsumed transit loss.</p> <p>Beginning in CY 2011, the Operations Secretary appears to have ceased the practice of recovering transit loss attributable to bank storage. We are discussing how to bring this issue to closure.</p>	<p>Colorado's basis is described in a memorandum to the Operations Committee captioned: "Response to (2007) Assistant Operations Secretary's Report.</p>

<i>ARCA Committee or other general comment(s)</i>
<ul style="list-style-type: none"> Added to matrix at direction of Operations Committee in Dec 2008 An investigation to determine transit losses and travel times of reservoir releases from Pueblo Reservoir to John Martin Reservoir is being conducted by Russell K. Livingston, to update a similar report he developed under the auspices of the U.S.G.S. in 1978. This investigation was commissioned by the Colorado Water Conservation Board, the Colorado Division of Water Resources, the Lower Arkansas River Valley Water Conservancy District and the Southeastern Colorado Water Conservancy District and is scheduled to be completed at the end of December 2010. Further discussion of this issue has been suspended by mutual consent pending consideration of the results of this investigation. In CY 2011, Russ Livingston completed his transit loss study between Pueblo and John Martin Reservoirs.

40 – Resolved -- Exchange of daily reservoir status accounting
41 – Resolved -- Non-reporting of Section II(C)(1) determinations
42 – Resolved -- Summer season interruption of transfers from conservation storage to accounts
43 – Resolved -- Winter storage period interruption of transfers from summer conservation storage to accounts

44 – City of Lamar regulating account	
<i>Kansas Staff Position</i>	<i>Colorado Staff Position</i>
[Kansas is considering conditions that would allow the temporary regulation storage]	City of Lamar requested a permanent account at December 2006 meeting of ARCA. Matter referred to the Engineering Committee.
<i>Kansas Staff Comments</i>	<i>Colorado Staff Comments</i>
The City of Lamar should propose an account in JMR to allow for the re-regulation of flows from other releases. Consideration should be given to conditions contained in the minutes of 1989 ARCA Annual meeting and Kansas comments from ARCA Special Meeting May 2002.	An engineering proposal describing proposed operations was provided to the Engineering Committee in December 2007.
<i>ARCA Committee or other general comment(s)</i>	
<ul style="list-style-type: none"> 2006: City of Lamar renewed their request at the December 2006 ARCA Annual Meeting / ARCA referred to Engineering Committee / 2007: engineering report provided in December 2007 2008: Colorado and Kansas provided comments on the City of Lamar's proposal in Dec 2008. This issue appeared to be dropped after these comments. 2013: With the river conditions experienced this year, the City through their attorney contacted Kansas about using a temporary account in John Martin Reservoir. Kansas is considering conditions that would allow the temporary regulation storage. 	

50 – Commencement of a spill event	
ARCA Committee	Full ARCA
Issue Category & Priority	C – 6a
Legal – Policy – Technical	Policy
Kansas Staff Position	Colorado Staff Position
The language places the event on the physical operation of the projects control structure and not on the elevation of the water surface or some other trigger. Colorado's timing of spill accounting is not suggested in the governing language.	Compact Article IV C (3) provides that the conservation pool will be operated for the benefit of water users in CO and KS...as provided by the Compact. See also, Art. IV C (2).
Kansas Staff Comments	Colorado Staff Comments
Rely on the physical operations of the project control structure to govern the loss of account water. No change to the language is required, unless clarifying language is desired.	Kansas' position ignores Corps of Engineers exclusive authority to determine flood control releases when JMR surface elevation rises into flood pool space. Contrary to express language of 1980 Operating Plan, water does not "spill physically over the project's spillway" during flood operations. Flood releases are normally made through the outlet works.
ARCA Committee or other general comment(s)	
OS recommendation 12/08/03: amend Section II G of 1980 Operating Resolution to clarify criteria defining the commencement of spill.	
Operations recommended moving this issue to Full ARCA. (14 December 2004)	
Moved to Special Engineering Committee pursuant ARCA 2005-01.	

51 – Resolved -- Spilling accounts

52 – Upstream storage during JMR spill events	
ARCA Committee	Administrative & Legal
Issue Category & Priority	B - 10
Legal – Policy – Technical	Legal
Kansas Staff Position	Colorado Staff Position
Upstream storage is not in priority until Section II accounts is completely spilled.	Compact not intended to impair use of water by either state if no material depletion to useable Stateline flows results. Apportioning water during flood operations may be a Compact issue for negotiation by ARCA, but is clearly not a 1980 Operating Plan issue to be determined by the Operations Committee. See earlier exchange of letters between Mr. Simpson and Mr. Pope on this issue.
Kansas Staff Comments	Colorado Staff Comments
Discontinue the practice until authorized by resolution of ARCA.	
ARCA Committee or other general comment(s)	
OS recommendation 12/08/03: Operations Committee should refer this issue to the Administrative and Legal Committee.	
Operations Committee transferred this issue to the Administrative and Legal Committee by memo dated 8 October 2004.	

53 – Adjusted JMR inflows during times of spill	
ARCA Committee	ARCA
Issue Category & Priority	C – 6c
Legal – Policy – Technical	Policy*
Kansas Staff Position	Colorado Staff Position
The 1980 Operating Plan does not provide for these adjustments. *Only can be resolved if 52 is resolved	Adjustments to inflow are necessary to account for the effect of post-compact upstream storage during the period that JMR is spilling.
Kansas Staff Comments	Colorado Staff Comments
Discontinue the practice until authorized by resolution of ARCA.	Inappropriate accounting related to conservation storage balances jeopardizes entitlements afforded by Compact Article V (f)
ARCA Committee or other general comment(s)	
OS recommendation 12/08/03: Operations Committee should table this matter until issue #52 is resolved.	
Operations recommended moving this issue to Full ARCA. (14 December 2004)	
Moved to Special Engineering Committee pursuant ARCA 2005-01.	

54 – Resolved -- Section II spill volume during summer storage season

60 – Section II(C) (2) compliance (Agreement B)	
ARCA Committee	Administrative & Legal
Issue Category & Priority	B - 9
Legal – Policy – Technical	Legal
Kansas Staff Position	Colorado Staff Position
District 67 priority calls under pre-JMR conditions are to occur when conservation storage is exhausted into accounts. Colorado does not comply with this requirement of the 1980 Operating Plan.	Agreement B is a separate document, not part of the 1980 Operating Plan, whereby Colorado water right owners agreed to subordinate certain aspects of their entitlement to enforce the priority of their water rights and is entirely consistent with administration of the priority system in Colorado. This issue is not properly before the Operations Committee.
Kansas Staff Comments	Colorado Staff Comments
Operate according to the 1980 Operating Plan as written or propose changes to the plan for consideration by the administration.	Agreement B is necessary to maintain the respective benefits of JMR between Colorado water rights above and below JMR granted under the Compact. It is not inconsistent with the Compact, the 1980 Operating Plan, or administration by Colorado of its priority system.
ARCA Committee or other general comment(s)	
No further progress can be made at this time.	
OS recommendation 12/08/03: Committee should refer this matter to the Administrative and Legal Committee with a recommendation that no further consideration be given to this issue.	
Operations Committee transferred this issue to the Administrative and Legal Committee by memo dated 8 October 2004.	
Moved to Special Engineering Committee pursuant ARCA 2005-01.	

61 – Resolved – Retroactive adjustments of accounting for prior years if accounting methods are revised
62 – Resolved -- OS Report status for 1994 through 2006
63 – Removed -- Status of Assistant Operations Secretary Reports: 1998, 1999, 2000, 2001 & 2002
64 – Resolved -- Assistant Operations Secretary Reports: purpose and timeliness
65 – Removed -- Consider Moving Date of Annual Meetings to January or February
66 – Resolved -- Need for definite process for introducing and resolving operational issues
67 – Resolved -- When issues are resolved, is it in the form of separate resolutions and /or revisions to the 1980 Operating Plan?

70 – Trinidad Reservoir: Passing of inflows exceeding 1,000 cfs	
ARCA Committee	Operations
Issue Category & Priority	
Legal – Policy – Technical	
Kansas Staff Position	Colorado Staff Position
Releases exceeding 1,000 cfs should be passed as soon as possible, up to the channel capacity called for.	December 3, 1999 letter from Hal Simpson to USBR includes revised ‘Criteria for Temporary Detention and Subsequent Release of Flood Flows Below Flood Control Capacity...’ recognizes a 3000 cfs ‘non-damaging flow’ constraint directed by the Corps of Engineers by letter dated April 16, 1993.
Kansas Staff Comments	Colorado Staff Comments
Inflows to Trinidad Reservoir exceeded 1,000 cfs on two separate occasions in August 2004. Those releases should have been passed through the reservoir and may have triggered a summer storage event at John Martin Reservoir.	The Water Commissioner requested that the release of these inflows be made: beginning at 1,000 cfs on Friday afternoon, August 6, 2004. He requested that the release be increased to 1,500 cfs on Saturday afternoon. The Corps rating curve for a downstream gage had a maximum release of 1,000 cfs. The Corps should reconsider the allowable release criteria in light of the USBR’s October 2009 Hydraulic Modeling Results. There is no controversy at issue between the states. Furthermore, ARCA has no authority to determine the non-damaging flow below Trinidad Reservoir. Therefore, this matter should be removed from the matrix.
ARCA Committee or other general comment(s)	
A letter was received from the Corps, dated 1 Nov 2004. This letter explains the events in August and steps that have been and will be taken to assure these releases will be passed in the future.	
Moved to Special Engineering Committee pursuant ARCA 2005-01.	
Channel capacity study for the Purgatoire River below Trinidad Reservoir through Trinidad, Colorado, has been undertaken in 2008.	

Notes on Water Issues Matrix

Resolutions:

- ❖ ARCA Adopted Resolution 2006-01 (John Martin Reservoir Permanent Pool Evaporation Method) on 12 Dec 2006 based on ARCA Special Engineering Committee Recommendation A
- ❖ ARCA Adopted Resolution 2006-02 (Winter Water and District 67 Winter Water Storage Charge Holding Accounts in John Martin Reservoir) on 12 Dec 2006 based on ARCA Special Engineering Committee Recommendation B
- ❖ Colorado should have a draft resolution on the Winter Water Program account. – May 2002
 - Kevin Salter responded to the Colorado draft resolution in October 2003
- ❖ ARCA Adopted Resolution 2006- 03 (Transfer of Conservation Storage to Section II Accounts
- ❖ under the 1980 Operating Plan) on 12 Dec 2006 based on ARCA Special Engineering Committee Recommendation C
- ❖ ARCA Adopted Resolution 2006-04 (Section II Account Spill Volume) on 12 Dec 2006 based on ARCA Special Engineering Committee Recommendation D
- ❖ For Issues #31 and 32, ARCA Special Engineering Committee Recommendation E addresses clarification of the 1980 Operating Plan for these two issues. *Issue #31 has been resolved, but need to look at clarification of the 1980 Operating Plan.* Steve Witte has drafted proposed resolution for this clarification.
 - Kevin Salter has presented an interpretation of the 1980 Operating Plan that may negate the need for a resolution or amendment in August 2003.
- ❖ City of Lamar is expected to submit at the May ARCA meeting a resolution for a regulating account in JMR.
 - Colorado indicated that this issue has been tabled indefinitely
 - LAWMA & DOW made presentation at December 2005 ARCA Annual Meeting
 - December 2006 ARCA referred renewed request to Engineering Committee

Versions	Modification Date	Description of Modification(s)
		Issues #32 & 67 were added 24 October 2003 at a meeting between State staffs
2002issues_table09b.doc	14 June 2004	Incorporate changes suggested by Steve Witte as transmitted by email dated 21 Jan 2004. Change issue status based on Joint categorization document dated 5 Feb 2004; made formatting and grammatical changes.
2005issues_table09c.doc	19 August 2004 12 Nov 2004 19 April 2005	-- Add a Trinidad Issues category. Specifically, Issue #70, the passing of inflows exceeding 1,000 cfs. -- Show Issue 52 & 60 as being transferred to the Admin & Legal Committee. -- add Issue #13 & 24 (19 April 2005), make formatting changes to table, adjust according to 19August 2004 Joint Prioritization memo, rename columns combining Legal, Policy & Technical and adding ARCA Committee and issue categorization
2005issues_table09d_letter.doc	20 April 2005	-- Changed format to 8-1/2 by 11 inch and reorganize sections -- Add actions taken at ARCA CY2004 Annual meeting
2006issues_table09d_letter.doc	11 December 2006	-- Add actions proposed by the ARCA Special Engineering Committee (created by ARCA Resolution 2005-01) on Issues 10, 20, 21, 30, 32, 42, 43 & 54.
2006issues_table10a_letter.doc	18 December 2006	-- Add ARCA actions taken at the 2006 ARCA Annual meeting -- Remove issues resolved by ARCA accepting Special Engineering Committee recommendations
2006issues_table10b_letter.doc	19 December 2006	-- Steve Witte offered suggestions for modifications in conference call with Kevin Salter on this date.
2007issues_table10bb_letter.doc	11 April 2007	-- working draft -- added Issue #25 & 26 according to the Operations Committee instructions -- added ARCA Resolutions information -- added ARCA Special Engineering Committee Recommendations on 31 & 32
2007issues_table10c.doc	1 December 2007	-- added Table of Contents -- modified according to 19 Nov OS-AOS meeting
2008issues_table10d.doc 2008issues_table10e.doc	1 December 2008	-- updated issues / Recommendation G / added City of Lamar / removed resolved issue(s)
2009issues_table11a.doc	22 December 2008	-- added reservoir-to-reservoir delivery issue -- updated issues / ARCA resolution adopting Recommendation G
2010issues_table11c.doc	17 September 2010	-- added Issue 27 (Section III.A language) -- updated Issue 33 positions & comments
2011issues_table11d.doc	25 November 2011	-- update 22 & 33 language
2012issues_table11d.doc	26 November 2012	-- update 12 language
2013issues_table11d.docx	14 November 2013	-- Modify language related to Kansas' positions on several pending issues

Water Issues Matrix Summary Table

Version Date: 12/01/2014

Issue #	Description	April 2005	Pending	Suspended	Removed	Resolved	ARCA Resolution	Comment
35	Totals	31	12	1	3	19		
10	Permanent Pool evaporation charges calculated by pro rata volume vs. incremental area	X				X	2006-01	Special Engineering Committee Recommendation A
11	Transfer of Account water to Permanent Pool during flood control operations in JMR	X			X			
12	Consideration of new sources for permanent pool water	X	x					In 2012, CDOW has proposed using the remaining portion of the Muddy Creek storage rights
13	1980 Operating Plan's Restriction on use of Section III related to Perm Pool	X			X			Steve Witte will review this to determine if it is still an issue.
20	Winter Water Account of convenience	X				X	2006-02	Special Engineering Committee Recommendation B
21	Timely distribution of Section III storage charge during Pueblo Winter Water Storage Program (PWWSP)	X				X	2006-02	Special Engineering Committee Recommendation B
22	Criteria for determining Section III storage under the Pueblo Winter Water Storage Program (PWWSP)	X	X					
23	Reporting of Winter Water vs. Winter Compact storage split calculation	X				X		See Joint Recommendations as transmitted by Operations Committee letter dated 19 August 2004.
24	Utilization of "Summer storage season" as defined by the 1980 Operating Plan	X	X					kls -- consider re-characterizing this issue under Issue 60 and remove as a separate issue per Steve's recommendation on 19 Nov 2007.
25	Criteria for Summer storage event trigger -- Section II.B 1		X					Placed on matrix in April 2007 / not currently before the Special Engineering Committee
26	Section II limitations on use made of account water to irrigation only		X					Placed on matrix in April 2007 / not currently before the Special Engineering Committee
27	First reference to Section II in Section III A appears to be inappropriate		X					Placed on matrix December 2009 / not currently before the Special Engineering Committee
30	Determination of transit loss under Section II(E)(4)	X				X		Resolved pursuant to an Agreement between State & Chief Engineers (December 2006).

Water Issues Matrix Summary Table

Version Date: 12/01/2014

Issue #	Description	April 2005	Pending	Suspended	Removed	Resolved	ARCA Resolution	Comment
31	Sections II (E)(4) and III (D) are unclear as to where transfers to make up deficits should be made	X				X	2007-05	Subject of Special Engineering Committee Recommendation E to be considered at the 2007 ARCA Annual meeting.
32	How should transit loss account be used?	X				X	2007-05	Subject of Special Engineering Committee Recommendation E to be considered at the 2007 ARCA Annual meeting.
33	Transit Loss on Reservoir-to-reservoir deliveries (e.g., deliveries of transmountain water to permanent pool)		X					Added in December 2008 / potentially resolved - pending documentation
40	Exchange of daily reservoir status accounting	X				X		See Joint Recommendations as transmitted by Operations Committee letter dated 19 August 2004.
41	Non-reporting of Section II(C)(1) determinations	X				X		See Joint Recommendations as transmitted by Operations Committee letter dated 19 August 2004.
42	Summer season interruption of transfers from conservation storage to accounts	X				X	2006-03	Special Engineering Committee Recommendation C
43	Winter storage period interruption of transfers from summer conservation storage to accounts	X				X	2006-03	Special Engineering Committee Recommendation C
44	City of Lamar regulating account	X	x					City of Lamar requested consideration in 2013 / Kansas considering
50	Commencement of a spill event	X	X					
51	Spilling accounts	X				X	2007-06	Subject of Special Engineering Committee Recommendation F to be considered at the 2007 ARCA Annual meeting.
52	Upstream storage during JMR spill events	X	X					
53	Adjusted JMR inflows during times of spill	X	X					
54	Section II spill volume during summer storage season	X				X	2006-04	Special Engineering Committee Recommendation D
60	Section II(C)(2) compliance (Agreement B)	X	X					
61	Retroactive adjustments of accounting for prior years if accounting methods are revised	X				X	2008-03	Special Engineering Committee Recommendation G

Water Issues Matrix Summary Table

Version Date: 12/01/2014

Issue #	Description	April 2005	Pending	Suspended	Removed	Resolved	ARCA Resolution	Comment
62	OS Report status for 1994 through 2006	X				X	2008-03	Special Engineering Committee Recommendation G
63	Status of Assistant Operations Secretary Reports: 1998, 1999, 2000, 2001 & 2002	X			X			
64	Assistant Operations Secretary Reports: purpose and timeliness	X				X		See Joint Recommendations as transmitted by Operations Committee letter dated 19 August 2004.
65	Consider Moving Date of Annual Meetings to January or February	X				X		Moved from removed to resolved in recognition of By-laws change (Sept 2011) which allows meeting date changes
66	Need for definite process for introducing and resolving operational issues	X				X		See Joint Recommendations as transmitted by Operations Committee letter dated 19 August 2004.
67	When issues are resolved, is it in the form of separate resolutions and /or revisions to the 1980 Operating Plan?	X				X		Process has been established to address resolution of issues as they were resolved.
70	Trinidad Reservoir: Passing of inflows exceeding 1,000 cfs	X		X				