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Sent: Thursday, November 16, 2006 5:56 PM
To: Pam Andersen; peter.ampe@state.co.us
Cc: Rolfs, Lee
Subject: Republican River Memorandum on Non-Federal Evaporation
Attachments: Memo re Republican Non-Fed Evap.pdf

Dear Pam and Pete-

Attached is a memorandum on the question whether evaporation from non-federal reservoirs is supposed to be included in Compact Accounting.

We would be most interested in your comments once you have had a chance to look it over.

Best regards-

John

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7/5/2007

DNR 007298

MEMORANDUM

By U.S. Mail and Email

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Subject: Whether Evaporation From Non-Federal Reservoirs Below Harlan
County Lake is Required to be Included in Republican River Compact
Accounting

Date: November 16, 2006

I. INTRODUCTION

The State of Kansas filed an original action, No. 126, *Kansas v. Nebraska and Colorado*, in the United States Supreme Court in May 1998. After resolution of certain issues by the Court and negotiations of the parties and the United States, the U.S. Supreme Court approved the Final Settlement Stipulation (FSS) by Decree of May 19, 2003, and dismissed related claims, 538 U.S. 720, which dismissal became final on October 20, 2003, 540 U.S.964. *See* Final Report of the Special Master With Certificate of Adoption of RRCA Groundwater Model 1-2 (Sept. 17, 2003).

The FSS consists of five printed volumes dated December 15, 2002, which were submitted to the Supreme Court in conjunction with the Second Report of the Special Master (Subject: Final Settlement Stipulation). Volume one of the FSS contains the non-appendix part of the FSS, together with Appendices A - D and K-M. Most of the citations for this Memorandum are found in that volume.

The implementation schedule for the FSS is found in Appendix B. It provides that compliance determinations under the FSS will begin with a five-year running average starting with the year 2003.

In accordance with the FSS, the States have agreed on the data for the years 2003 and 2004. *See, e.g.*, RRCA 2005 Annual Report, at 7. The FSS required the States to conduct inventories of Non-Federal Reservoirs by December 31, 2004, for inclusion in the annual Compact Accounting. FSS, at C53. Non-Federal Reservoirs are defined as

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“Reservoirs other than Federal Reservoirs that have a storage capacity of 15 Acre-feet or greater at the principal spillway elevation.” *Id.*, at 6. Each State submitted an inventory of Non-Federal Reservoirs in accordance with that requirement. The Nebraska inventory and updates thereof through March 2005 include Non-Federal Reservoirs below Harlan County Lake. See Email from Mike Thompson to Ken Knox et al., dated March 21, 2005 (includes reservoirs in Franklin, Webster and Nuckolls Counties).

The 2003 data used for Compact compliance accounting for that year does not include Non-Federal Reservoir data either above or below Harlan County Lake, in accordance with the fact that the inventory was not submitted until after computations for 2003 were complete. The 2004 compliance accounting agreed to by Nebraska includes Non-Federal Reservoirs in the accounting, both upstream and downstream of Harlan County Lake.

Concurrent with the adoption of the 2004 compliance accounting by the States, the RRCA Engineering Committee did a review and clean-up of the FSS Accounting Procedures. Certain corrections to the Accounting Procedures were made. None of the States suggested any change to the Accounting Procedures with respect to accounting of Non-Federal Reservoir evaporation.

The current question, whether the Compact accounting required in the FSS includes evaporation from Non-Federal Reservoirs below Harlan County Lake, arose in the context of finalizing the data, model runs and Compact accounting for the year 2005. The new

Engineering Committee representative for Nebraska argued that a different section of the FSS, entitled "VI. Soil and Water Conservation Measures," includes a provision that indicates that Non-Federal Reservoir evaporation below Harlan County Lake should be excluded from Compact Accounting. That provision, Section VI.A, reads as follows:

"For the purposes of Compact accounting the States will calculate the evaporation from Non-Federal Reservoirs located in an area that contributes run-off to the Republican River above Harlan County Lake, in accordance with the methodology set forth in the RRCA Accounting Procedures." FSS, at 32.

The question is whether the specific requirement in Paragraph VI.A that evaporation from Non-Federal Reservoirs above Harlan County Lake be included in computations of Compact compliance, by implication, excludes evaporation from Non-Federal Reservoirs below Harlan County Lake from such computations.¹

II. ANALYSIS

A. **The Republican River Compact Requires That Evaporation From Non-Federal Reservoirs Below Harlan County Lake be Included in Compact Accounting.**

Article III of the Republican River Compact sets out the computed average annual water supply originating in the various designated drainage basins or parts thereof. Article IV of the Compact then allocates the average virgin water supply among the States for beneficial consumptive use. The allocation for each State begins, "There is hereby

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The analysis in this Memorandum does not rely on the confidential information from the negotiations that would explain the reasons for including Section VI.A more explicitly. That confidential analysis could be made if necessary.

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allocated for beneficial consumptive use in” (emphasis added). In turn, the term

“Beneficial Consumptive Use” is defined as follows:

“The term ‘Beneficial Consumptive Use’ is herein defined to be that use by which the water supply of the Basin is consumed through the activities of man, and shall include water consumed by evaporation from any reservoir, canal, ditch, or irrigated area.” RRC, Art. II. (emphasis added).

Thus, the allocations provided for in the Compact itself clearly require that evaporation from any reservoir, including Non-Federal Reservoirs below Harlan County Lake, be accounted for in the allocation among the States.

The Final Settlement Stipulation does not seek to alter this rule from the Compact:

“The States agree that this Stipulation and the Proposed Consent Judgment are not intended to, nor could they, change the States’ respective rights and obligations under the Compact.” FSS, at 2. The United States Supreme Court has said as much. *Texas v. New Mexico*, 462 U.S. 554, 564 (1983) (“once given, congressional consent transforms an interstate compact within [the Compact] Clause into a law of the United States. One consequence of this metamorphosis, is that, unless the compact to which Congress has consented is somehow unconstitutional, no court may order relief inconsistent with its express terms.” (internal quotation marks and citations omitted)). Thus, there can be little doubt, since all the reservoirs in question below Harlan County Lake are within the basin, that the allocation effected by Article IV of the Compact and the definition of Beneficial

Consumptive Use provided in Article II require that evaporation from Non-Federal Reservoirs below Harlan County Lake be included in Compact accounting.

B. The FSS Specifically Requires that All Non-Federal Reservoir Evaporation Be Included in Compact Accounting.

The primary Compact accounting provisions are contained in Section IV of the FSS. Section IV.A sets out the overall framework:

“The States will determine Virgin Water Supply, Computed Water Supply, Allocations, Imported Water Supply Credit, augmentation credit and Computed Beneficial Consumptive Use based on a methodology set forth in the RRCA Accounting Procedures, attached hereto as Appendix C.”
FSS, at 17.

The question being addressed in this Memorandum boils down to whether Non-Federal Reservoir evaporation above, but not below, Harlan County Lake, is to be taken into account in the determination of Virgin Water Supply and Computed Beneficial Consumptive Use, pursuant to Section IV.A above and Appendix C.

“Computed Beneficial Consumptive Use” is defined in Appendix C to include “Net evaporation from Non-Federal Reservoirs within the surface boundaries of the Basin.” FSS, at C.8. This definition is particularly expansive since it refers to reservoirs “within the surface boundaries of the Basin.” This definition appears to carry with it an extra emphasis on the extension of the definition to all areas within the surface boundaries of the Basin, which would include the area below Harlan County Lake. The inclusion of all Non-Federal Reservoirs within the surface boundaries of the Basin in the Accounting

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Procedures answers the question raised in this Memo conclusively, but there are further indications that inclusion of Non-Federal Reservoir evaporation below Harlan County Lake is a necessary part of the Compact Accounting under the FSS. Importantly, there is no engineering basis for differentiating between above and below Harlan County Lake with respect to accounting for evaporation from Non-Federal Reservoirs.

If one goes to the specific formulas required to be used for Compact Accounting, the required inclusion of evaporation from Non-Federal Reservoirs below Harlan County Lake is seen even more clearly. On page C37 of Appendix C, Evaporation from Non-Federal Reservoirs is given an abbreviation of EvNFR. The area in question is on the mainstem, which in the original version of the formulas contained in the bound volume one of the Final Settlement Stipulation is found on pages C44-C47. On page C45, the last item listed for "CBCU Nebraska" is "EvNFRn." Thus, the evaporation from Non-Federal Reservoirs in Nebraska is required on the mainstem. There is no exclusion for any area of the mainstem. In particular, there is not exclusion of areas within the mainstem that are below Harlan County Lake. Also, on page C47 EvNFRn is included as an element of virgin water supply. Again, no exclusion is made for any part of the basin, including the part of the basin below Harlan County Lake. The foregoing is particularly telling in the context of the specific geographic limitations that appear throughout the Specific Formulas section on individual sub-basin accounting. See FSS, at C37-C47.

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Appendix C was reviewed and revised by the RRCA Engineering Committee in a document entitled "Republican River Compact Administration, Accounting Procedures and Reporting Requirements, Revised July 27, 2005". This document was adopted by the RRCA at its annual meeting in 2006 as an amendment to Appendix C of the FSS. Relevant excerpts of that document are attached to this Memorandum. The section of the formulas for Compact Accounting that apply to the mainstem begin on page 33 of the document. Certain changes were made to the section, but the inclusion of "EvNFRn" was not changed in any way. In fact, the committee determined that there had been an oversight in not including a similar term for the CBCU Kansas portion of the accounting. Therefore, the engineering committee recommended adding a term to the CBCU Kansas calculation designated as "EvNFRk." Thus, the accounting formulas for computed consumptive beneficial use (CBU) were not modified to delete the reference to Non-Federal Reservoirs in the part of the basin including the areas below Harlan County Lake, but were strengthened by adding a parallel term for the Kansas part of that accounting. This further confirms the requirement of the FSS that evaporation from Non-Federal Reservoirs below Harlan County Lake must be included.

The same can be seen to be true based on the formulas applicable to the calculation of virgin water supply (VWS). This requirement was strengthened in the revised version of Appendix C, as shown by the excerpts attached to the Memorandum. The VWS in that document is described on pages 35-37. Additional terms were added in the revisions,

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specifying even more specifically the necessity of including evaporation from Non-Federal Reservoirs below Harlan County Lake in the computations necessary for Compact Accounting. For instance, on page 35, an additional term was added, $EvNFRk$, requiring specific inclusion of evaporation from Non-Federal Reservoirs in Kansas in the calculation of VWS. Inclusion of the $EvNFR$ term is found in four other instances on those pages. Thus, the review and cleanup of Appendix C that was performed by the engineers from Nebraska, Kansas and Colorado in 2004 and 2005 strengthen the requirements already plainly evident in the FSS as originally adopted that require inclusion of evaporation from Non-Federal Reservoirs in the entire basin, including, specifically, the areas of the basin in the mainstem drainage below Harlan County Lake.

It should be noted, as well, that in the first year of Compact Accounting of the completion of the Non-Federal Reservoir inventory, that Nebraska showed no hesitation in agreeing to the inclusion of evaporation from Non-Federal Reservoirs below Harlan County Lake.

C. There is No Provision in the FSS Excluding Evaporation from Non-Federal Reservoirs Below Harlan County Lake From Compact Accounting.

The genesis of the concern being addressed in this Memorandum comes from Section VI.A of the FSS, which provides that evaporation from Non-Federal Reservoirs above Harlan County Lake will be included in the Compact Accounting. Inclusion of this provision in the FSS has the effect of insuring that it cannot be changed. The FSS has

been directly approved by the U.S. Supreme Court and can be changed only as specifically allowed in the FSS or by order of the Supreme Court. The provisions of Appendix C, on the other hand, can be changed by action of the RRCA. FSS, at 2, § I.F. This difference explains why Section VI.A was included in the FSS and why it should not be inferred from that inclusion that evaporation from Non-Federal Reservoirs below Harlan County Lake should be excluded.

D. Conclusion

The inclusion of Section VI.A in the Final Settlement Stipulation should not be taken as a sign that the States intended to exclude evaporation from Non-Federal Reservoirs below Harlan County Lake, particularly when every other indication in the FSS is consistent with or specifically requires inclusion of such evaporation below Harlan County Lake. Further, it would be inconsistent from an engineering point of view to exclude areas below Harlan County Lake but include areas above. Finally, a contrary interpretation of the Final Settlement Stipulation would lead to a conflict with the Republican River Compact itself, a result that would clearly be unacceptable to the U.S. Supreme Court.

Republican River Compact Administration

ACCOUNTING PROCEDURES

AND

REPORTING REQUIREMENTS

Revised July 27, 2005

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$$06848500 + \text{CBCUc} + \text{CBCUk} + \text{CBCUn} - 0.6 \times \text{Dn below gage} - \% \times \text{Pn below gage} - 0.5 \times \text{M\&In below gage} - \text{EvNFRn below gage} + \Delta \text{S Keith Sebelius Lake} - \text{IWS}$$

Note: The CBCU surface water terms for Nebraska which occur below the gage are added in the VWS for the Main Stem

$$\begin{aligned} \text{CWS} &= \text{VWS} - \Delta \text{S Keith Sebelius Lake} - \text{FF} \\ \text{Allocation Kansas} &= 0.457 \times \text{CSW} \\ \text{Allocation Nebraska} &= 0.076 \times \text{CWS} \\ \text{Unallocated} &= 0.467 \times \text{CWS} \end{aligned}$$

15. The North Fork of the Republican River in Nebraska and the Main Stem of the Republican River between the junction of the North Fork and the Arikaree River and the Republican River near Hardy

$$\begin{aligned} \text{CBCU Colorado} &= \text{GWc} \\ \text{CBCU Kansas} &= \\ & \text{(Deliveries from the Courtland Canal to Kansas above Lovewell)} \times (1 - \% \text{BRF}) \\ & + \text{Amount of transportation loss of Courtland Canal deliveries to Lovewell that does not return to the river, charged to Kansas} \\ & + \text{(Diversions of Republican River water from Lovewell Reservoir by the Courtland Canal below Lovewell)} \times (1 - \% \text{BRF}) \\ & + 0.6 \times \text{Dk} \\ & + \% \times \text{Pk} \\ & + 0.5 \times \text{M\&Ik} \\ & + \text{EvNFRk} \\ & + \text{Harlan County Lake Ev charged to Kansas} \\ & + \text{Lovewell Reservoir Ev charged to the Republican River} \\ & + \text{GWk} \\ \text{CBCU Nebraska} &= \end{aligned}$$

- Deliveries from Courtland Canal to Nebraska lands x (1- %BRF)
- + Superior Canal x (1- %BRF)
- + Franklin Pump Canal x (1- %BRF)
- + Franklin Canal x (1- %BRF)
- + Naponee Canal x (1- %BRF)
- + Cambridge Canal x (1- %BRF)
- + Bartley Canal x (1- %BRF)
- + Meeker-Driftwood Canal x (1- %BRF)
- + 0.9 x Red Willow Canal CBCU
- + 0.6 x Dn
- + % x Pn
- + 0.5 x M&In
- + EvNFRn
- + 0.9 x Hugh Butler Lake Ev
- + Harry Strunk Lake Ev
- + Swanson Lake Ev
- + Harlan County Lake Ev charged to Nebraska
- + GWn

Notes:

The allocation of transportation losses in the Courtland Canal above Lovewell between Kansas and Nebraska shall be done by the Bureau of Reclamation and reported in their "Courtland Canal Above Lovewell" spreadsheet. Deliveries and losses associated with deliveries to both Nebraska and Kansas above Lovewell shall be reflected in the Bureau's Monthly Water District reports. Losses associated with delivering water to Lovewell shall be separately computed.

Amount of transportation loss of the Courtland Canal deliveries to Lovewell that does not return to the river, charged to Kansas shall be 18% of the Bureau's estimate of losses associated with these deliveries.

Red Willow Canal CBCU = Red Willow Canal Diversion x (1- % BRF)

10% of the Red Willow Canal CBCU is charged to Nebraska's CBCU in Red Willow Creek sub-basin

10% of Hugh Butler Lake Ev is charged to Nebraska's CBCU in the Red Willow Creek sub-basin

None of the Harry Strunk Lake EV is charged to Nebraska's CBCU in the Medicine Creek sub-basin

VWS

=

- Republican River near Hardy Gage Stn. No. 06853500
- North Fork of the Republican River at the State Line, Stn. No. 06823000
- Arikaree Gage at Haigler Stn. No. 06821500
- Buffalo Creek near Haigler Gage Stn. No. 06823500
- Rock Creek at Parks Gage Stn. No. 06824000
- South Fork Republican River near Benkelman Gage Stn. No. 06827500
- Frenchman Creek in Culbertson Stn. No. 06835500
- Driftwood Creek near McCook Gage Stn. No. 06836500
- Red Willow Creek near Red Willow Gage Stn. No. 06838000
- Medicine Creek below Harry Strunk Lake Gage Stn. No. 06842500
- Sappa Creek near Stamford Gage Stn. No. 06847500
- Prairie Dog Creek near Woodruff, Kansas Stn. No. 68-485000

- + CBCUc
- + CBCUn

- + 0.6 x Dk
- + % x Pk
- + 0.5 x M&Ik
- + EvNFRk

+ Harlan County Lake Ev charged to Kansas
 +Amount of transportation loss of the Courtland Canal above the Stateline that does not return to the river, charged to Kansas

- 0.9 x Red Willow Canal CBCU
- 0.9 x Hugh Butler Ev
- Harry Strunk Ev

- + 0.6 x Dn below Medicine Creek gage
- + % x Pn below Medicine Creek gage
- + 0.5 * M&In below Medicine Creek gage
- + EvNFRn below Medicine Creek gage

+ 0.6 x Dn below Beaver Creek gage
 + % x Pn below Beaver Creek gage
 + 0.5 * M&In below Beaver Creek gage
 + EvNFRn below Beaver Creek gage

+ 0.6 x Dn below Sappa Creek gage
 + % x Pn below Sappa Creek gage
 + 0.5 * M&In below Sappa Creek gage
 + EvNFRn below Sappa Creek gage

+ 0.6 x Dn below Prairie Dog Creek gage
 + % x Pn below Prairie Dog Creek gage
 + 0.5 * M&In below Prairie Dog Creek gage
 + EvNFRn below Prairie Dog Creek gage

+ Change in Storage Harlan County Lake
 + Change in Storage Swanson Lake

- Nebraska Haigler Canal RF
 - 0.17 x Culbertson Canal RF
 - Culbertson Canal Extension RF to Main Stem
 + 0.24 x Meeker Driftwood Canal RF which returns to
 Driftwood Creek
 - 0.9 x Red Willow Canal RF

+ Courtland Canal at Kansas-Nebraska State Line Gage Stn
 No. 06852500
 - Courtland Canal RF in Kansas above Lovewell Reservoir

-IWS

Notes:

None of the Nebraska Haigler Canal RF returns to the North
 Fork of the Republican River

83% of the Culbertson Diversion RF and none of the
 Culbertson Extension RF return to Frenchman Creek

24 % of the Meeker Driftwood Canal RF returns to
 Driftwood Creek.

10% of the Red Willow Canal RF returns to Red Willow
 Creek

Courtland Canal RF in Kansas above Lovewell Reservoir =
 0.015 x (Courtland Canal at Kansas-Nebraska State Line
 Gage Stn No. 06852500)

CWS = VWS - Change in Storage Harlan County Lake - Change in
 Storage Swanson Lake - FF

Allocation Kansas = 0.511 x CWS

Allocation Nebraska = 0.489 x CWS

V. Annual Data/ Information Requirements, Reporting, and Verification

The following information for the previous calendar year shall be provided to the members of the RRCA Engineering Committee by April 15th of each year, unless otherwise specified.

All information shall be provided in electronic format, if available.

Each State agrees to provide all information from their respective State that is needed for the RRCA Groundwater Model and RRCA Accounting Procedures and Reporting Requirements, including but not limited to the following:

A. Annual Reporting

1. Surface water diversions and irrigated acreage:

Each State will tabulate the canal, ditch, and other surface water diversions that are required by RRCA annual compact accounting and the RRCA Groundwater Model on a monthly format (or a procedure to distribute annual data to a monthly basis) and will forward the surface water diversions to the other States. This will include available diversion, wasteway, and farm delivery data for canals diverting from the Platte River that contribute to Imported Water Supply into the Basin. Each State will provide the water right number, type of use, system type, location, diversion amount, and acres irrigated.

2. Groundwater pumping and irrigated acreage:

Each State will tabulate and provide all groundwater well pumping estimates that are required for the RRCA Groundwater Model to the other States.