

# EXHIBIT C002

**IN RE: NON-BINDING ARBITRATION PURSUANT TO THE  
FINAL SETTLEMENT STIPULATION, KANSAS v. NEBRASKA  
AND COLORADO,  
NO. 126 ORIGINAL**

**BEFORE JEFF FEREDAY, ARBITRATOR**

**JOINT EXPERT REBUTTAL REPORT**

**DICK WOLFE, P.E.  
STATE ENGINEER  
AND  
DR. WILLEM A. SCHREÜDER  
PRINCIPIA MATHEMATICA**

I. Nebraska's Rock Creek Augmentation Project (Rock Creek Plan)

We have reviewed the Report on the Nebraska Rock Creek Augmentation Plan prepared by David W. Barfield dated July 1, 2013, the Report on the Nebraska Rock Creek Augmentation Plan prepared by Steven P. Larson and Samuel P. Perkins dated June 30, 2013, as well as the Report on the Nebraska Rock Creek Augmentation Plan prepared by Dale E. Book dated July 1, 2013 (collectively the "Kansas Reports").

The Kansas Reports outline four issues where the Kansas authors believe the Rock Creek Plan is deficient:

- 1. The Rock Creek Plan requires clear limits on the quantity of water to be pumped. These limits should prevent the expansion of use of the Rock Creek Plan beyond the historic consumptive use of its wells.*
- 2. The Rock Creek Plan requires a full consideration of losses below its outflow, through the use of the Model. The Model must be used to determine the augmentation credit of the Rock Creek Plan.*
- 3. The Rock Creek Plan requires a clear mechanism to demonstrate that augmentation deliveries are required for Compact compliance, with data exchange requirements that are sufficiently specific and complete to allow the States to verify operations.*
- 4. The Rock Creek Plan requires temporal limits and review by the RRCA for changed conditions.*

We offer our opinions following each of these four issues, which are repeated below:

1. ***Kansas Issue 1: The Rock Creek Plan requires clear limits on the quantity of water to be pumped. These limits should prevent the expansion of use of the Rock Creek Plan beyond the historic consumptive use of its wells.***

It is our opinion that the Rock Creek Plan has clearly identified reasonable limits on the quantity of water to be pumped. These limits are identified in the Nebraska Report. Additionally, there is nothing in the Compact, Final Settlement Stipulation (the “FSS”), or elsewhere that requires such limits to be based on the historical consumptive use of the wells being discontinued as part of this Plan. To the contrary, the FSS does not limit augmentation wells to historical consumptive use, even though the term “historic consumptive use” is defined in the FSS and appears throughout the document.<sup>1</sup> For example, Section III.B.g specifically limits replacement wells to their historical consumptive use. Section III.B.k does not limit augmentation wells in the same way, as augmentation wells are “wells acquired or constructed by a State for the sole purpose of offsetting stream depletions.” Those wells are not limited to historical consumptive use. Instead, they cannot cause “any new net depletion to stream flow either annually or long-term.” Colorado supports Nebraska's interpretation of this requirement as articulated in the Rock Creek Plan.

2. ***Kansas Issue 2: The Rock Creek Plan requires a full consideration of losses below its outflow, through the use of the Model. The Model must be used to determine the augmentation credit of the Rock Creek Plan.***

We disagree with Kansas' experts' method of calculating the Augmentation Water Supply credit (the “AWS credit”) for the Rock Creek Plan. First, they suggest that the AWS credit should be calculated using the same procedure used to calculate the Imported Water Supply credit (the “IWS credit”). It is our opinion that this is inappropriate for many reasons. For example, IWS credit and AWS credit deal with different types of water and serve different purposes. Imported water calculated as part of the IWS credit is water imported from the South Platte River basin and is not allocated under the Republican River Compact. Augmentation water delivered to the Republican River is native water from the Republican River basin. The purpose of the IWS credit is to avoid charging a State for consumption of that water. The purpose of the AWS credit is to determine the credit a State should receive to offset its consumption of Republican River water under the Compact.

Second, Kansas experts read Section IV.H of the FSS to require that the AWS credit be calculated exclusively using the RRCA Groundwater Model (the “Model”). They read that section to exclude the use of measured data in determining the AWS credit. It is

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<sup>1</sup> FSS, December 15, 2002, Volume 1 of 5, Section II, p. 5. Definitions: Historic Consumptive Use: That amount of water that has been consumed under appropriate and reasonably efficient practices to accomplish without waste the purposes for which the appropriation or other legally permitted use was lawfully made.

our opinion that Kansas' experts reading of Section IV.H is inconsistent with the FSS and is not supported by science or principles of groundwater modeling. It is our opinion that the language in the FSS indicates that the depletions to baseflow caused by pumping the augmentation wells should be evaluated using the RRCA Groundwater Model, as opposed to, for example, using Glover or some other method to determine those depletions. The final AWS credit should be calculated in accordance with the Accounting Procedures by subtracting those depletions from measured augmentation deliveries.

It is our opinion that Kansas' experts' exclusive reliance on the RRCA Groundwater Model to calculate the AWS credit is inconsistent with their criticism of the Model's ability to accurately predict groundwater declines. Kansas' experts assert that groundwater levels in the vicinity of the Rock Creek Plan and flows into Rock Creek are declining, and that the Model tends to underestimate groundwater level declines. Kansas' experts do not draw any conclusions or express any opinions based on these observations. However, it is unreasonable to question the validity of the Model, yet recommend that it be exclusively used to calculate the entirety of the AWS credit. Instead, it would be more reasonable to use actual measurements wherever possible and to use the Model only to estimate the stream depletions caused by the Augmentation Wells since these quantities cannot be measured.

It is our opinion that Kansas' experts propose unreasonable reductions in the amount of AWS credit. Kansas' experts assert that because the Republican River above Swanson Reservoir often goes dry, only a portion of the augmentation water added to Rock Creek will reach Swanson Reservoir. They again draw no conclusions and express no expert opinions regarding this observation, but the implication is that the AWS credit should be limited to the amount of water that reaches Swanson Reservoir. It is our opinion that there is no justification for such a limitation and there is no similar offset or limitation applied to other surface water above Swanson Reservoir.

3. ***Kansas Issue 3: The Rock Creek Plan requires a clear mechanism to demonstrate that augmentation deliveries are required for Compact compliance, with data exchange requirements that are sufficiently specific and complete to allow the States to verify operations.***

It is our opinion that this is not a reasonable justification for opposing the Rock Creek Plan since neither the FSS nor the Compact requires a demonstration that augmentation deliveries are required for Compact compliance. Furthermore, specifications for reporting and verification of operations under the Rock Creek Plan are covered by routine RRCA reporting requirements.

4. ***Kansas Issue 4: The Rock Creek Plan requires temporal limits and review by the RRCA for changed conditions.***

It is not unreasonable to request a periodic review of augmentation plans given the complexity of operations in the Republican River basin and the uncertainties with changing conditions whether operationally or due to changes in hydrologic conditions. Once approved, however, an augmentation plan should be allowed to continue operating as approved unless it is proven that there has been a substantial change in aquifer conditions demonstrating the augmentation plan will not be able to continue operating in the manner proposed. The State suggesting that there has been such a change in aquifer conditions should have the burden of proof on that issue.

II. Alternative Water Short Year Administration Plan (WSYA Plan)

We have reviewed the expert report on the Alternative Water Short Year Administration Plan (WSYA Plan) prepared by David W. Barfield dated July 1, 2013.

Mr. Barfield outlined the following five issues where he finds the WSYA Plan lacking:

1. *The proposed action under Nebraska's plan was not definite but included a suite of potential options, none of which were specifically committed to in the Plan.*
2. *Nebraska's plan proposed water savings that were not definite and instead offered a potential range of water savings. The range was based on a non-exhaustive list of possible actions. Of the possible actions, only the proposed groundwater curtailment in the Rapid Response Areas identified in the IMPs could be quantified as of August 1.*
3. *With indefinite actions and water savings, the Nebraska plan had no means for the RRCA to conduct its evaluation and reach agreement on the Plan's actions and its water savings by November 1. While Nebraska's IMPs contain a forecasting process to identify a potential need for CBCU reduction or CBCU offsets, the forecasted need is not the same as a specific commitment to actions that can be quantified as of August 1 and evaluated by November 1.*
4. *In its Plan, Nebraska suggested that the base conditions be the condition of the basin as of 2002. Appendix M does not make this characterization. Reductions should be assessed based on the current management conditions and anticipated water supply conditions when plans would be in effect. That would establish the additional water saved above the status quo. The "base condition" will be specific to the action being proposed.*
5. *Some of the specific potential actions in the IMPs would not qualify.*
  - a. *Thus actions of the IMPs that are designed to increase supplies, such as augmentation, are not acceptable components of a CBCU reduction plan.*
  - b. *Other actions that would not produce definite water savings. This would include many aspects of real-time water administration.*

*In addition, to these insufficiencies, Nebraska did not work with the states to define procedures for evaluation of including how the “base condition” would be defined and methods to evaluate water savings.*

We offer our opinion to these issues as follows:

It is our opinion that the WSYA Plan satisfies the requirements of Appendix M of the FSS. Colorado disagrees with Mr. Barfield's assertions that the WSYA Plan is not sufficiently definite to satisfy the requirements of Appendix M of the FSS, or to allow the RRCA to evaluate the savings resulting from the IMPs. Nebraska should not be governed by what methods Kansas would prefer but whether the specific actions proposed by Nebraska meet the requirements of Appendix M. States are entitled to and need as much flexibility as possible in responding to requirements of Compact compliance all while meeting the requirements of the FSS and the Compact. Colorado continues to believe that the actions proposed by Nebraska under its IMPs and the resulting reductions in CBCU qualify under Appendix M and are reasonable and achievable to support approval of the WSYA Plan.