Response to Kansas' Reports on Nebraska's N-CORPE Augmentation Plan

James C. Schneider, Ph.D.

Nebraska Department of Natural Resources

February 7, 2014

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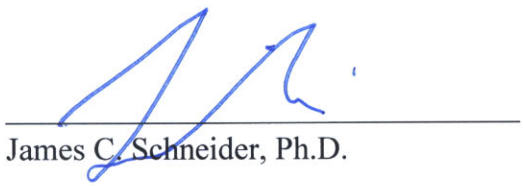
Qualifications and Compensation

I have prepared this expert report on behalf of the State of Nebraska. A true and accurate copy of my curriculum vitae is attached hereto as Appendix A. The opinions contained in this report are made to a reasonable degree of scientific certainty. In preparing this report, I utilized theories and methodologies that are accepted within the scientific community and which have been subject to peer-reviewed analysis and publication.

I have prepared this report as a part of my regular duties as an employee of the State of Nebraska and have received no compensation outside of my normal salary and benefits.



James C. Schneider, Ph.D.

1.0 Introduction

This report is a response to the expert reports of Steven P. Larson and Samuel P. Perkins, Dale E. Book, and David W. Barfield, all dated January 24, 2014, and all responding to Nebraska's N-CORPE Augmentation Plan (Plan) submitted to the Republican River Compact Administration (RRCA) on June 10, 2013. My understanding of these reports is further illuminated by answers received during depositions of these individuals conducted by Nebraska counsel from January 29-31, 2014.

The primary objections to the Plan raised by the State of Kansas in these reports can be summarized as follows:

1) The N-CORPE project and corresponding Plan does not consider the potential for transit losses of the augmentation water within Medicine Creek and the Republican River.

2) Nebraska's surface water administration conducted to ensure compliance with the Republican River Compact, might result in Kansas receiving water it cannot use.

3) Streamflows in the Republican River Basin will decline in the future, thereby increasing transit losses.

It is clear that Kansas has done little more than repackage the same arguments it made during the Rock Creek Arbitration. I address only the issues specifically identified and discussed in the reports Kansas submitted in the present N-CORPE Arbitration. I hereby incorporate my responses to Kansas' reports as filed in the Rock Creek Arbitration. *See* Exhibit N20022.

2.0 Transit Losses

The report of Mr. Larson and Dr. Perkins and the bulk of the report by Mr. Book are dedicated to a discussion of potential transit losses. These reports do not include any comprehensive assessment of what the actual transit losses from the operation of the Plan will be. Rather, these reports discuss the matter of transit losses "conceptually" and refer to a "possibility" of transit losses.

Mr. Book makes an assumption, without consulting the RRCA Groundwater Model (Model), that transit losses could be 10%. Mr. Book testified in his deposition that he believed this to be a reasonable assumption based on his professional experience. The Model results prepared by Mr. Larson and Dr. Perkins suggest transit losses of anywhere between approximately 30% and nearly 100%, although they never actually suggest an appropriate value to be employed.

Comparison of Model output to the actual real-world conditions on Medicine Creek indicate the futility of relying on the Model for the determination of transit losses.

As explained in my Rock Creek Arbitration Report, N20022 at 8, 10, the issue of transit losses is not relevant. However, this Arbitration offers an opportunity to examine why using the Model to calculate transit losses is particularly fraught with problems.

Thomas E. Riley has prepared a report on behalf of the State of Nebraska in this proceeding titled "Responsive Report to the Kansas Analysis of the Nebraska Cooperative Republican Platte Enhancement (N-CORPE) Plan," February 7, 2014. In this report Mr. Riley presents information on the actual hydrologic conditions that exist on Medicine Creek from the discharge point of the N-CORPE delivery pipe downstream to Harry Strunk Lake on Medicine Creek. For example, in the real world, perennial flow in Medicine Creek begins less than two (2) miles below the Project discharge point, and groundwater levels are so high that construction of the delivery pipe required substantial near-surface dewatering.

In contrast, the Model appears to compute[1] that the perennial flow in Medicine Creek begins nearly ten (10) miles downstream of the discharge of the project. This area is identified in the Model at this location because the Model computes groundwater levels that are over nine (9) feet below the streambed at the discharge point in the absence of the augmentation water, so that much, if not all, of the augmentation water is lost to the aquifer before it reaches the headwaters. Not surprisingly, the vast majority of the losses predicted by Larson and Perkins occur in this reach of the Modeled world, which does not reflect reality. This comparison confirms that the Model would not be an appropriate tool for this type of analysis (i.e., the injection and routing of augmentation flows).

Moreover, as the Arbitrator correctly concluded in the Rock Creek Arbitration, requiring the assessment of transit losses for augmentation water would treat such water differently than all other water in the Basin, and the FSS provides no justification for doing so. As previously recognized by Mr. Barfield, the N-CORPE project is designed to deliver augmentation water as "surface flow." *See* January 14, 2013, letter in Appendix B. The Plan involves the delivery of "surface flow." Therefore, these "surface flows" should be treated as all other surface flows in streams are treated in the RRCA Accounting Procedures. Today transit losses are not assigned to surface flows in Medicine Creek. Transit losses associated with the Plan, if they exist, should likewise ***not*** be assigned.

Mr. Book attempts to justify singling out augmentation water for unique accounting treatment through a flawed demonstration that the water originates "much higher in the basin than the

[1] To be clear, this is not something the Model user informs the Model about. Rather the Model itself computes this location based on various inputs. This is one reason the Model result derived by Kansas is so different from the real world.

surface water projects." (page 5)[2] Visual examination of his Figure 1 makes it clear that surface water Computed Beneficial Consumptive Use (CBCU) from evaporation at Enders and Swanson Reservoirs and from diversions in the Haigler canal, the Culbertson canal, and the Meeker-Driftwood canal all occur approximately the same distance upstream (if not further) from Harlan County Lake as the N-CORPE project. Notably, in 2012, Nebraska was charged nearly 30,000 acre-feet of CBCU from these sources. No "transit loss" discount was provided to Nebraska's CBCU based on the notion that this water would not have made it downstream to Harlan County Lake. Rather, Nebraska was charged with the full amount of this CBCU, without discounting for potential transit losses. This is because the Compact accounting does not assign transit losses.

Ultimately, transit losses, if any, work to Nebraska's detriment so Nebraska is fully incentivized to ensure they are minimized. While Kansas complains transit losses will harm its allocation, Kansas fails to note Nebraska's allocation would be harmed even more because Nebraska receives a higher allocation from Medicine Creek. *See* Book at Table 3. *Compare* N20022 at 12.

This is borne out by the following example: Assume Nebraska augmented streamflows by 60,000 acre-feet (as Mr. Book assumes), and that Nebraska received a credit of 60,000 acre-feet. Assume further that in fact only 40,000 acre-feet of water reaches the State line. If Nebraska does not ensure 60,000 acre-feet of water arrives at the State line by making up the difference, Nebraska would still miss its Compact requirement to keep its uses (offset by any credits) within its allocation. Nebraska recognizes this obvious consequence that the potential for transit losses creates. This is exactly why Nebraska must ensure that a volume of water (though not necessarily the same drops) equivalent to the Augmentation Water Supply (AWS) Credit does in fact reach the State line while not causing reduction in the flow that otherwise would have been there absent the AWS.

3.0 Compact Call Year Water Administration

In Mr. Barfield's report he discusses the water administration that Nebraska undertook in 2013 to ensure compliance with the Compact. Nebraska administered this water in strict accordance with its Integrated Management Plans (IMPs). After years of litigation with Kansas, Special Master Kayatta recently found the IMPs to be reasonable and valid. Moreover, as explained in my Rock Creek Arbitration Report, this is a red herring. *See* N20022 at 17.

Mr. Barfield's principle issues with that administration appear to be that the Kansas Bostwick Irrigation District (KBID) was precluded from carrying stored water from 2013 over into 2014, and that Kansas was forced into a "disadvantageous" agreement regarding the assessment of evaporation from Harlan County Lake. Notably, it appears that all water not consumed in 2013

[2] Figure 1 in Mr. Book's report incorrectly portrays the Meeker-Driftwood canal, which diverts water directly out of Swanson Reservoir.

now resides in Lovewell Reservoir where it may be used to irrigate lands in KBID this year. Not surprisingly, Mr. Barfield fails to identify any harm to his water users as a consequence of the lack of carryover.

In any event, Lovewell Reservoir is expected to fill in 2014 and Nebraska's current compliance activities for 2014 will result in approximately 70,000 acre-feet of water that will be available through Harlan County Lake. KBID has made arrangements with the Bureau of Reclamation to use only 30,000 acre-feet from Harlan County Lake. Therefore, KBID would be unable to use any carryover water that might have existed in 2014 anyway.

It is worth noting that much of the water that was required to be released in 2013 was a result of Mr. Barfield's rejection of Nebraska's Alternative Water-Short Year (AWSY) Plan and Nebraska's Rock Creek Plan. In fact, the Arbitrator's decision in the AWSY and Rock Creek Arbitrations was issued just as the transfer of water from Harlan County Lake to Lovewell Reservoir was beginning. At that time, there was approximately 10,000 acre-feet of Compact Water in Harlan County Lake, which needed to reach Kansas in 2013. The change in Nebraska's accounting balance provided by the Rock Creek Augmentation Plan would have totaled approximately 6,000 acre-feet in 2013, and the corresponding change in the accounting balance from the AWSY Plan would have been approximately 4,500 acre-feet in 2013 for a total of 10,500 acre-feet. Therefore, had Mr. Barfield simply accepted the decision of the Arbitrator when it was issued on November 25, 2013, there would have been no need to release the Compact Water. This means Mr. Barfield brought about the very result of which he now complains.

4.0 Future Conditions in the Republican River Basin

Mr. Barfield also claims, apparently based solely on his work in the current Supreme Court litigation, that Nebraska is undergoing some type of systematic "dewatering" of the Republican River Basin. He further claims, without producing any further evidence or analysis, that the N-CORPE project will somehow "facilitate" this process. This too was litigated before Special Master Kayatta, who concluded that the analysis of the future conditions in the Basin conducted by Mr. Barfield "falls short of the mark and rests on invalid assumptions." *See Kansas v. Nebraska and Colorado*, No. 126 Orig., Final Report (11/17/2013).

At any rate, if Mr. Barfield were concerned that the N-CORPE project will "facilitate" this supposed "dewatering," the best course of action for him would be to approve the Plan. As mentioned above, Nebraska will be providing approximately 70,000 acre-feet of water to Kansas in 2014 as a result of the actions deemed necessary under the IMPs. However, the forecast in these IMPs has indicated that only about 43,000 acre-feet of water are needed. The most significant reason for the extra 27,000 acre-feet is Mr. Barfield's rejection of the Plan and the Rock Creek Augmentation Plan.

Due to Mr. Barfield's rejections of the Rock Creek Arbitration decision, the Rock Creek project will be pumping approximately 20,000 acre-feet to offset about 14,000 acre-feet of CBCU and the N-CORPE project will be pumping approximately 43,000 acre-feet of water to offset about 23,000 acre-feet of CBCU. As discussed above, this "dewatering" will produce water far in excess of the actual water needs in Kansas in 2014. Mr. Barfield is, ironically, now the one perpetuating dewatering in this portion of the Basin. It is clear that if Mr. Barfield were sincere in his concerns regarding future transit losses, his efforts would be far better spent in addressing the "dewatering" of the Kansas portion of the Basin than fighting the adoption of these augmentation plans.

5.0 Kansas' Miscellaneous Concerns Lack Merit and are Irrelevant

Mr. Barfield's report (with some reliance on Mr. Book) also contains a series of vague and miscellaneous complaints regarding the completeness of the Plan. For the most part, as Mr. Barfield confirmed in his deposition, these are the same concerns raised in the Rock Creek Arbitration. I will, therefore, rest on my prior response offered in that context.

Mr. Barfield further complains of "a lack of stream data along Medicine Creek." However, he offers no suggestions on how to remedy that situation. Nebraska already operates two of the Compact streamgages at no cost to the other States (the remaining gages are operated by the U.S. Geological Survey). However, Nebraska would be glad to discuss the potential for additional streamflow monitoring, including the appropriate cost-share for such data collection activities. However, this clearly should not be a necessary predicate to approval of the Plan.

Next, Mr. Barfield seems to be concerned with the fact that the project may also intermittently deliver water to the Platte River. He then notes that reporting of deliveries to both rivers should be required. As Nebraska must report deliveries to the Republican River in order to claim credit for them, this should not be an issue. Moreover, the Model domain runs to the Platte River and any and all pumping associated with the project will be accounted for and reported as it is now. As to the deliveries to the Platte River, I would note that nothing in the FSS would prohibit Nebraska from developing the same project for the sole purpose of delivering water to the Platte River, and no approvals from the RRCA would be required, other than reported pumping from the project. Outside of a full and accurate reporting of the total amount of groundwater pumping (including pumping for delivery to the Platte River), N-CORPE activities regarding the Platte River should be none of Mr. Barfield's concern.

Finally, Mr. Barfield is concerned about any additional changes to the RRCA Accounting Procedures that Nebraska may intend to make. This is apparently related to Nebraska's commitment in the Rock Creek Arbitration to reduce the AWS Credit by the amount of any new depletion caused by the augmentation pumping. Nebraska would make a similar commitment with regard to the Plan, while noting that Nebraska would not calculate an AWS Credit in any

year when there are no augmentation deliveries (which can occur under this Plan), Nebraska would not expect an AWS Credit in excess of the AWS (such as when the new depletions are negative, or there are "new accretions"), and Nebraska would not intend to double count any water under the Plan.

6.0 Conclusions and Opinions

The Kansas expert reports provide no basis for Kansas' rejection of the Plan. Specifically:

1) The FSS does not require the assessment of transit losses in an augmentation plan, and the Model produces a flawed assessment of any such transit losses that may occur under the Plan.

2) Nebraska administers the surface water system in the Republican River Basin to ensure compliance with the Compact in accordance with its IMPs. Kansas asserts no technical or legal basis to complain about this administration and focuses instead on what is best characterized as simply their preferred method of compliance. Kansas seeks to condition Nebraska's method of compliance on the "benefits" that might accrue to its users, but the only benefit to which Kansas is entitled is compliance with the Compact.

3) There is no credible evidence of future "dewatering" in the Nebraska portion of the Republican River Basin, particularly in the Plan area; though if this was a valid concern Mr. Barfield's rejection of the Plan would facilitate such "dewatering" (not the Plan itself).

4) The Plan fully satisfies all requirements in the FSS and should be approved, subject to the following additional conditions, which are specifically based on the Rock Creek Arbitration decision:

    a. The RRCA should review the Plan in 20 years and discuss any potential revisions to the Plan that should be considered at that time, and

    b. The AWS Credit should be adjusted for any new depletions that occur under the Plan, thus utilizing the Model to the extent practical to compute the AWS Credit.

Appendix A: Curriculum Vitae for James C. Schneider, Ph.D.

Curriculum Vitae for James C. Schneider, Ph.D.

Areas of Specialization

- Water resources management and planning
- Groundwater flow modeling
- Administration of interstate water Compacts, Decrees, and Agreements
- Hydrogeology
- Statistical analysis of hydrologic data
- Surface-water hydrology
- Environmental geophysics

Education

- Ph.D. in Geology (May 2003) - University of South Florida, Tampa, Florida
- M.S. in Geology (May 1998) - Northern Illinois University, DeKalb, Illinois
- B.S. in Geology (May 1996) - Northern Illinois University, DeKalb, Illinois

Professional History

- **Deputy Director (2010-) *Nebraska Department of Natural Resources (DNR)***

  Responsibilities: Advising and assisting the Director in formulating and administering department policies, budget, organization, and work assignments; assisting in formulation of state water policies, particularly as they pertain to water quantity issues, including serving as liaison with the legislature, other state and local agencies, and public interest groups; overseeing the general administration of the department and assuming responsibility for the department's operation in the Director's absence; assisting the Director in administration of interstate compacts and decrees; serving as the State's Representative on technical committees for compacts and decrees; overseeing the work of consultants and preparing special reports related to surface water or surface and groundwater interactions; assisting the Director in reviewing permit applications and groundwater management plans; and assisting the Director in water rights hearings and analysis of permit applications; supervising the Integrated Water Management Division.

- **Head, Integrated Water Management Division (2008-2009) *Nebraska DNR***

  Responsibilities: Manage the integrated water management planning process at the Department, including oversight of surface- and groundwater related studies, development and implementation of integrated management plans, supervision of the Integrated Water Management Division and coordination with other Department Divisions, Natural Resources Districts, and other State and Federal agencies.

- **Senior Groundwater Modeler (2007) *Nebraska DNR***

  Responsibilities: Serve as NDNR groundwater flow modeling expert.

- **Senior Hydrogeologist/Geophysicist (2006)** ***SDII Global Corporation***

  Responsibilities: Manage hydrogeology and geophysics projects and prepare contract reports and publications. Serve as company groundwater flow modeling expert. Serve as company geophysics expert.

- **Staff Geologist (2003–2005)** ***SDII Global Corporation***

  Responsibilities: Conduct hydrogeology projects and prepare hydrogeology contract reports and publications. Assist senior staff as technical resource for litigation and peer reviews of technical reports. Serve as company groundwater flow modeling expert. Serve as resource to subsidence investigation group.

- **Research Assistant (1998 – 2002)** ***University of South Florida, Geology Dept.***

  Responsibilities: Conducting field research, data interpretation, geophysical surveys and groundwater model development for a variety of projects throughout Florida as well as in other states and in Jamaica. Teaching undergraduate and graduate level lab and lecture courses.

Publications

Schneider, J.C., S.B. Upchurch, J. Chen, C. Cain, J. Good, 2008. Simulation of groundwater flow in North Florida and South-central Georgia. Peer reviewed technical report issued to the Suwannee River Water Management District.

Schneider, J.C., P.H. Koester, D.R. Hallum, R.R. Luckey, and J. Bradley, 2007. Managing Nebraska's groundwater resources in the Platte and Republican River Basins using regional groundwater models. Geol. Soc. Am., 2007 Abstracts with Programs.

Upchurch, S.B., K.M. Champion, *J.C. Schneider*, D. Hornsby, R. Ceryak, W. Zwanka, 2007. Identifying water-quality domains near Ichetucknee Springs, Columbia County, Florida. Proceedings of 4th Conference on Hydrogeology, Ecology, Monitoring, and Management of Ground Water in Karst Terrains.

Schneider, J.C., S.B. Upchurch, and K.M. Champion, 2006. Stream-aquifer interactions in a karstic river basin, Alapaha River, Florida. Geol. Soc. Am. Southeastern Section, 2006 Abstracts with Programs.

Schneider, J.C. and S.E. Kruse, 2005. Assessing natural and anthropogenic impacts on freshwater lens morphology on small barrier islands: Dog Island and St. George Island, FL. Hydrogeology Journal 14: 131-145.

Schneider, J.C., S. Upchurch, M. Farrell, A. Janicki, J. Good, R. Mattson, D. Hornsby, K Champion, D. Wade, K. Malloy, 2005. Development of minimum flows and levels for Blue Spring, Madison County, Florida. Geol. Soc. Am. Southeastern Section, 2005 Abstracts with Programs.

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Kruse, S., *J. Schneider*, and J. Greenwood, Ejemplos del uso de métodos eléctricos y electromagnéticos para el mapeo de la salinidad del agua subterránea en zonas costeras, *II Congreso Multidisciplinario de Investigación Ambiental*, January 22-23, Managua, Nicaragua, 2004.

Schneider, J.C. and S.E. Kruse, 2003. A comparison of controls on freshwater lens morphology of small carbonate and siliciclastic islands: Examples from barrier islands in Florida, USA. Journal of Hydrology 284: 253-269.

Greenwood, J., S. Kruse, *J.C. Schneider*, and P. Swarzenski, 2002. Shallow seafloor conductivity structure from nearshore electromagnetic *surveys, Eos. Trans. AGU, 83(47), Fall Meet. Suppl., Abstract OS22B-0257.*

Schneider, J.C., and S.E. Kruse, 2001. Characterization of freshwater lenses for construction of groundwater flow models on two sandy barrier islands, Florida, USA. First International Conference on Saltwater Intrusion and Coastal Aquifers-Monitoring, Modeling, and Management, Essaouira, Morocco, 9 p.

R. Dean, B. DeArmond, M. Gerseny, M. Lesmerises, R. Csontos, M. Pollock, J. Natoli, L. Bierly, J. Nettick., J. Meyer, M. Tibbits, W. Sullivan, *J. Schneider*, S. Kruse, V. Peterson, S. Yurkovich, J. Burr, and J. Ryan, 2001. Geophysical transects across the margins of the Carroll Knob mafic/ultramafic complex, Macon County, North Carolina, Geol. Soc. Am. Southeastern Section, 2001 Abstracts with Programs, A-67.

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Schneider, J.C., and S.E. Kruse, 2000. Hydrostratigraphy of a developing barrier island, St. George Island, Florida, EOS, Trans. AGU, 81, F472.

Kruse, S.E. and *J.C. Schneider*, 2000. Freshwater lens of Dog Island, FL. Technical report issued to the Barrier Island Trust.

Kruse, S.E., *J.C. Schneider*, J.A. Inman, and J.A. Allen, 2000. Ground Penetrating Radar Imaging of the Freshwater/Saltwater Interface on a Carbonate Island, Key Largo, Florida. GPR 2000: Proceedings of the 8th International Conference on Ground Penetrating Radar, Gold Coast, Australia, SPIE Vol. 4084: 335-340.

Schneider, J.C. and P.J. Carpenter, 1998. Geophysical Identification of Karst Fissures Near a Landfill in Southwestern Illinois. Proceedings from the Symposium on the Application of Geophysics to Environmental and Engineering Problems, p. 985-992.

Interstate Organizations

- **Republican River Compact Administration (2007-)**

  Responsibilities: Participate in Engineering Committee and Compact Administration Meetings representing State of Nebraska. Serve as official representative on the Engineering Committee beginning in 2010.

- **Platte River Recovery Implementation Program (2007-)**

  Responsibilities: Participate in Water Advisory Committee and in implementation of Nebraska New Depletions Plan. Represent Nebraska on the Governance Committee (Chair 2011) and the Finance Committee beginning in 2010.

- **North Platte Decree Committee (2010-)**

  Responsibilities: Nebraska alternate to the North Platte Decree Committee.

- **Interstate Council on Water Policy (2010 -)**

  Responsibilities: Represent Nebraska on Committees and at annual meetings. Elected to the Board of Directors in 2011.

Expert Witness Testimony

- **Non-binding arbitration in *Kansas v. Nebraska & Colorado,* No. 126 Orig. (2008)**

  Responsibilities: Provided deposition and trial testimony in non-binding arbitration initiated in October 2008 relating to Kansas' claims for damages and future compliance, and Nebraska's proposal to fix accounting errors.

- **Non-binding arbitration in *Kansas v. Nebraska & Colorado,* No. 126 Orig. (2010)**

  Responsibilities: Provided deposition and trial testimony in non-binding arbitration initiated in May 2010 relating to Nebraska's Crediting Issue and Colorado's Augmentation Pipeline.

- **U.S. Supreme Court litigation in *Kansas v. Nebraska & Colorado,* No. 126 Orig. (2012-2013)**

  Responsibilities: Provided deposition and trial testimony in U.S. Supreme Court litigation in 2012 and 2013relating to Kansas' claims for damages and future compliance.

- **Non-binding arbitrations in *Kansas v. Nebraska & Colorado,* No. 126 Orig. (2013)**

  Responsibilities: Provided deposition and trial testimony in non-binding arbitrations initiated in 2013 relating to Nebraska's Rock Creek Augmentation Plan, Nebraska's Alternative Water-Short Year Plan, Colorado's Compact Compliance Pipeline Proposal, and Colorado's Bonny Reservoir Accounting Proposal.

Appendix B: January 14, 2013, Letter from David Barfield to Brian Dunnigan

Kansas
Department of Agriculture
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Dale A. Rodman, Secretary
David W. Barfield, Chief Engineer

Sam Brownback, Governor

January 14, 2013

Brian P. Dunnigan, P.E.
Nebraska Commissioner
Republican River Compact Administration
Nebraska Department of Natural Resources
301 Centennial Mall South
PO Box 94676
Lincoln NE 68509-4676

RE: Republican River Compact, Nebraska augmentation plans

Dear Commissioner Dunnigan:

On the evening before the December 11, 2012 Special Meeting of the Republican River Compact Administration (RRCA) requested by Nebraska, Nebraska provided to Colorado and Kansas, via email, three documents related to possible augmentation plans by Nebraska to offset consumptive use by Nebraska in excess of its allocation, that Nebraska wished to discuss. One of those documents is entitled "Inclusion of Imports of Platte River Basin Water Supplies into the RRCA Accounting," ("Imports Document") dated December 10, 2012. The Imports Document outlines a concept by Nebraska to "enhance" the "Imported Water Supply Credit" that is calculated under the current RRCA Accounting Procedures. The Imports document refers to a map, labeled "Project Area Map," which was also one of the three documents provided on December 10. The third document was entitled "Outline for Augmentation Plan to RRCA" ("Augmentation Outline") and offered Nebraska's vision of the topics and issues that need to be addressed in order for the RRCA to agree upon an augmentation plan.

At the special meeting of the RRCA, Nebraska asked that Kansas and Colorado evaluate the Imports Document and the Augmentation Outline and provide Nebraska with their initial responses. Kansas also asked that Nebraska provide the calculations and backup for Nebraska's preliminary and final Republican River Basin Forecast. Although Nebraska initially agreed to this request, I now understand from your letter of January 7, 2013, that Nebraska is declining to do so. Also, I note that no response to Nebraska's request has been forthcoming from Colorado. Nevertheless, Kansas is responding to Nebraska's request as fully as practicable given the shortness of time, the lack of specifics provided by Nebraska, and the fact that Nebraska's documents raise issues that are presently before the Special Master or likely to be affected by rulings of the Special Master and the Supreme Court in the pending litigation. With those substantial caveats, Kansas now provides an initial response to Nebraska in order to alert Nebraska to Kansas' initial reactions to Nebraska's submittals.

With regard to the Imports Document's new proposal to convert some 62 wells shown on the Project Area Map from irrigation to augmentation purposes, it may be helpful to note the following. The proposed pumping would be mostly from wells in the Republican River Basin, not the Platte River Basin (55 of the 62 wells shown on the Project Area Map are in the Republican River Basin). There is no evidence that these wells pump water that was recharged from the Platte River canals.

The Imported Water Supply Credit established in the Final Settlement Stipulation (FSS) was a result of negotiations regarding Nebraska's assertion that the irrigation projects in the Platte River Basin have artificially created additional water supplies within the Republican River Basin. This specific credit was designed to address the uncontrolled effects of these irrigation projects on the groundwater levels in the area straddling the two basins and on stream baseflows. The FSS contains no provisions addressing the artificial "enhancement" of these baseflows to produce an altered IWS credit.

The concept described by Nebraska's Imports document appears to be a proposal for an augmentation project, i.e., a plan to pump groundwater and deliver it as surface flow for the sole purpose of offsetting stream depletions in order to comply with the Compact. Based only on an initial review of the concept, it appears to Kansas that it would be a poor fit to combine the proposed augmentation pumping concept with the existing Imported Water Supply Credit calculation of uncontrolled irrigation effects. As an augmentation project that pumps groundwater, we believe that Nebraska must show that pumping from these wells will not cause any new net depletions to streamflow either annually or long-term. Kansas is interested in discussing further with Nebraska how best to accomplish Nebraska's desire to augment streamflow in a way that protects the interests of Kansas.

Nebraska's Augmentation Outline seems to be a general characterization of a generic proposal for an augmentation plan and includes many of the broad topics about which Kansas would be concerned.

Of course, any specific augmentation plan will need to include sufficient detail to allow identification of all relevant issues and concerns and a thorough review by the technical staff of each state. For example, an augmentation project downstream of the storage afforded by Harlan County Reservoir would have different considerations than projects above that storage.

Moreover, Kansas needs to see the specifics of each augmentation plan in order to ensure that it will not reduce the usability of Kansas' allocation under the Compact in quantity, timing, or location. In addition, given the lack of experience the states have with augmentation plans under the FSS and the complexity of operations, periodic review and a limited term of approval would be appropriate.

To begin addressing the issues identified above, the following topics should be included in the outline:

- Location and extent of the stream depletions that the project is intended to offset;
- Records and analysis of the historical use of the wells to be used for augmentation;
- Proposed operational limits and proposed project accounting to ensure that the usability to Kansas will not be impaired by planned operations. Supporting analysis should accompany the proposed limits and accounting;
- Other operational details should include but not be limited to: Seasonal operating plans, considerations for water short and normal years, flow rates, and location of discharge;
- Plan for periodic review and evaluation of the project; and
- Consumptive use of the augmentation water and how it will be modeled.

More meaningful comments by Kansas would be facilitated by a more detailed presentation by Nebraska of its specific plans, including operational aspects and proposed accounting changes.

Kansas recognizes Nebraska's efforts in these documents to raise issues that are important to all the states. Nebraska should recognize that this brief response was prepared in a compressed time frame to accommodate Nebraska's request.

Sincerely,

David Barfield

David Barfield, P.E.
Kansas Chief Engineer

pc: Dick Wolfe