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Kinsley, Kansas 67547
July 11, 2018

Water Resources
Received

JUL 16 2018

KS Dept Of Agriculture

Mr. David Barfield, P.E.
Chief Engineer
Division of Water Resources – KDA
1320 Research Park Drive
Manhattan, Kansas 66502

Dear Chief Engineer Barfield:

RE: Comments on Draft Master Order dated May 4, 2018, cities of Hays and Russell Contingent Approval of Change Applications regarding R9 Water Rights

These comments are from the perspective of an agricultural engineer and irrigated agriculture producer with 42 years of experience in Edwards County, where I live and have a farming business, and the surrounding area counties.

It is becoming pretty apparent in that I see the condition of the alluvial aquifer along the Arkansas River very differently from your perspective. I guess that is based on my long years of farming in the same area, plus my knowledge of the R9 Ranch from its beginning to the present day.

Much has happened in that time. We tried to get water into the Arkansas River from the state of Colorado via legal means, and our victory of sorts gave Kansas quite a bit of cash, but not much water. This decision has pretty well sealed the future of the Arkansas River from Dodge City to around Larned as far as stream flow is concerned. All we are left with is base flow, and it appears that this base flow is not keeping up with irrigation demand in the area. Another important factor is the fact that just a few miles to the west in Ford County are irrigation operations who are allowed by Kansas Water Law to pump up to 24 inches per year, and do this regularly. Our closest wells to the R9 Ranch are declining and have been for some time because of this lack of recharge from the Arkansas River. It is obvious to me that the only way to curtail this trend is to have some sort of voluntary plan to reduce pumping, such as a WCA. Only now we are having to consider whether the cities of Hays and Russell will also be considered as a part of this solution, or a huge part of the problem. It all depends, it appears, on scientifically sound analysis of the present condition of the area. You have put out your vision for this in the Master Order with your consumptive use analysis, plus the sustainability analysis by your staff and by Hays' consultant, Burns & McDonnell. I now observe the analysis of Dr. Andy Keller with his very different view. From my experience in the area, I concur 100 % with the work done by Keller. Very careful scientific analysis should determine how much water can be sustainably transferred below the maximum 3,790 Acre-Feet per year determined by Dr. Andy Keller.

I have seen good water flow in the Arkansas River in the area adjacent to the R9 Ranch only three times in the 42 years that I have lived here: once in the 80's, once in the 90's and in 2016. And the river flow (and really dynamic recharge) in each of those periods occurred after huge rainfall events in the upstream reaches of the Arkansas just west of, adjacent to, and in Edwards County, along with its tributaries. This is not a very good omen for the future, as rainfall in this part of the world is quite

unpredictable, as we all know. And in the 1980's, during one of those periods of high rainfall events and recharge, the Circle K Ranch wells were tested for certification. Because of the strong recharge at that time, good flow rate tests were obtained.....the pumps were actually providing the water the nozzle packages on the center pivots called for. Just think of what the certified pumping rates and resulting volumes would have been like if these same wells had been tested during one of the many prolonged dry periods. The certified volume would only be around half of what it was certified at. During these dry periods, surrounding neighbors heard the pumps and motors roar and whine when the wells were dewatered during irrigation, as their rpm's increased drastically when there was no water left in the wells. It is likely that flow rate tests could not have even been conducted unless the pumps were throttled back enough to have steady flow conditions.

But the city of Hays was warned about the conditions in the local area by a consultant that they hired prior to purchasing the Circle K Ranch.....his name is Robert L. Vincent, Ground Water Geologist, and his company is Ground Water Associates, Inc. I have a copy of the conclusions from his report, dated November 17, 1994, that he presented to the city of Hays. Here is a partial summary of his conclusions:

- 1) "The ranch area can support the removal of 5500 acre feet of water per year with recharge from the Arkansas River, but continued recharge from this source appears doubtful;
- 2) The area can naturally support the removal of between 3200 and 3800 acre feet of water per year, and the actual amount would depend upon whether the average recharge to the area is one or two inches;
- 3) When potable water quality is considered, this amount could be reduced to approximately 1400 acre feet;"

The balance of the report deals with the poor water quality in the alluvial aquifer along the Arkansas River. It is worthy to note that Mr. Vincent's conclusions listed above are at least somewhat similar to the conclusions brought forward by Dr. Andy Keller in his 2016 and 2017 analysis performed for Water PACK.

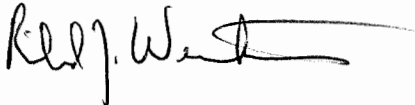
On our farm we have a wide range of soil types that we irrigate using center pivot systems. These soil types range from the Pratt series (water holding capacity of 0.06 inches of water held per inch of soil, and holds 2.16 inches of water in a 3 foot root zone) to a Tabler clay loam (water holding capacity of 0.18 inches of water held per inch of soil, and holds 6.48 inches of water in a 3 foot root zone). Obviously, irrigating the Pratt series soil without wasting water and fertilizer is a real challenge. Even a rain of over 1 inch on these soils results in deep percolation back to the aquifer. Light, frequent applications of water by the center pivot is the desired management technique to supply ET demand on the crops, but this is very dependent on the pumping flow rate into the irrigation system. For example, a 900 GPM pumping rate into a 128 acre center pivot will supply .37 inches of water per day at 100 % application efficiency, barely enough to keep up with the daily ET for a crop such as corn or alfalfa. I know I am preaching to the choir here, but I am trying to show that it is next to impossible to keep up with ET demand on Pratt series soils during most of the growing season. Something has to give, and it is usually reflected in sub-standard yields. In addition, the water right limit of 18 inches is a true limit on these light sandy soils. With the sandy Pratt and Pratt Tivoli soil types coupled with declining pumping flow rates on the R9 Ranch gives me a strong opinion that using well-watered, deep, heavy soils growing 4-5 cuttings of alfalfa per season for a consumptive use calculation for the R9 Ranch is not a relevant or accurate application of the change of use regulation K.A.R 5-5 9-12. Most of the alfalfa raised on the R9 Ranch was 1-2 cuttings per year if rainfall was above normal, with the other cuttings yields falling away as the pumping rates declined during the irrigation season. Part of the reason for this is also the shallow saturated depths of groundwater underlying the R9 Ranch, where the wells are mostly in the 38 to 75 foot depth. This is what allows the wells to dewater when one tries to pump higher volumes from

shallow wells. Another strike against the notion that this farm ever was able to produce "normal, economical" yields of corn or alfalfa.

I am thankful that you have called for public input on this Master Order. What has occurred is two very different visions of the amount of water that can be converted to municipal and sustainably transferred to the cities of Hays and Russell. Both the cities of Hays and Russell have stated on many occasions that they only want to transfer what is sustainable. This is clear thinking, because if the transfer amount is not sustainable, all that will result is a series of impairments both for and against the cities. The lack of return flows to the aquifer in a municipal transfer project makes it all the more important that the best science available be used to determine what accurate sustainability looks like. I trust that your concern with the public interest in this issue will add gravity to your actions going forward as these issues are sorted out.

Thank you again for allowing public comment on this very important issue to me in the future of our farming operation and to the people who live here and earn their living from irrigated agriculture in the Edwards County and GMD # 5 area.

Sincerely yours,

A handwritten signature in black ink, appearing to read "Richard J. Wenstrom". The signature is fluid and cursive, with a long horizontal stroke extending to the right.

Richard J. Wenstrom, P.E.