

Eudora's Fight for Independence – A Natural Resource Conflict



The City of Eudora is named after Eudora Fish. She was the daughter of Paschal Fish, a leader of the Shawnee people who sold much of the land in the Eudora area to the early settlers. This statue was made by Sculptor Jim Brothers and was placed in the Eudora City Park in 2007.

Six years ago, the city of Eudora's City Administrator pursued the development of a Source Water Protection Plan. While Eudora did not have any new imminent threats at that time, it was clear that the Kansas Highway 10 Corridor would continue to experience growth of some kind. Where this growth might occur was unclear, but the development of a plan would likely help guide that growth to the best locations possible. The Source Water Assessments required by the Safe Drinking Water Act were still relatively new and a protection plan was the next logical step.

The Kansas Rural Water Association was asked to coordinate the development effort and to draft a plan for consideration by the city council. The city's wellfield west of town in the Kansas River floodplain was inventoried for potential contamination sources and protection area boundaries were established. In addition to identifying different the potential threats and the need to educate the persons responsible for them, the city desired to make the protection area boundaries a matter of public record. They asked the Douglas County Planning and Zoning Department to establish the protection area on their

zoning maps. The matter was recommended for approval by the Lawrence-Douglas County Planning Commission and was approved by the Board of Douglas County Commissioners in 2007. The Eudora Source Water Protection Area was officially adopted!

Who is Eudora?

Eudora is a town with a population of approximately 6,200 people. It is located in eastern Douglas County, tucked between the Kansas River on the north and Kansas Highway 10 on the south. Growth has been occurring south of K-10 Highway in recent years. While some might consider Eudora to be a bedroom community to Lawrence to the west and Kansas City to the east, it has been attracting retail establishments and other companies in recent years. Its first "permanent" settlers arrived in 1851, a full ten years before statehood. It is no doubt that the proximity of land above the floodplain but close the river was attractive to the founders.



This field in the foreground is a small part of the proposed Penny's Concrete Company sand pit which could ultimately be nearly 300 acres in size. Equipment to support the current in-channel dredging operation and stockpiles of sand and gravel are in the background.

Past source water protection efforts

The Eudora Wellfield is located in the Kansas River valley, between the Kansas River, and the Wakarusa River which hugs the southern side of the valley. Consisting of four wells at the present time, water rights authorize the diversion of 227.77 million gallons per year (MGY) at a maximum rate of diversion of 2,230 gallons per minute (gpm). A nearby water right authorized for irrigation use has been generously donated to the city too, and will help meet water demands generated by the area's growth. Two other small capacity wells, located near the city, are used as standby wells.

The protection area described above is defined as the area within two miles of the municipal wells, south of the Kansas River, in Douglas County. There is land within two miles of the wells north of the river, but since it is in Leavenworth County, Douglas County has no zoning authority. This two-mile area corresponds to the original Zone C of the Source Water Assessment in Douglas County.

US Army Corps of Engineers' decisions

The Kansas River Valley, besides being a great source of water for municipalities, agriculture and industries, has also been an excellent source of aggregate for concrete. The aggregate – crystalline sand-and-gravel sized rock – is used to make strong concrete and is preferred in the Kansas City area for road and building construction. The Missouri River Valley also has sand and gravel resources, but it occasionally contains unacceptable amount of lignite, a soft form of coal. The premium grade of Kaw Valley sand is limited in quantity because of the very size of the river basin and the amount of water transporting the material downstream. Now complicating the availability of this aggregate are decisions by the US Army Corps of Engineers to restrict aggregate mining within the river itself, where unacceptable riverbed degradation has occurred. One such location is on the Kansas River in the vicinity of Eudora. Because of this restriction and probable future restrictions on in-channel dredging, it is likely that sand companies are continuously looking for properties in the valley where the most favorable gravel deposits and highway access are believed to be located.

More pits

In the last three years, two different companies have proposed that conditional use permits be issued to allow sand and gravel mining within the source water protection overlay zone. While Eudora's protection zone has been established geographically, no follow-up was taken to enact any restrictions on any activities within the protection zone. While better than having no zone at all, nothing is in the county regulations or long-term planning documents to restrict any hazardous activities that may be proposed near the wells.

The first sand pit proposed to be located within the protection area after its designation was on the site of a former, private, 9-hole golf course. The edge of the resulting



Douglas S. Helmke, L.G., Kansas Rural Water Association's Water Rights / Source Water Specialist, gave testimony to the Douglas County Board of Commissioners at their November 28, 2012, meeting at the Douglas County Courthouse. He described the possible risk of common surface water contaminants that could be introduced to the aquifer, possibly causing a change of Eudora's water classification to Groundwater Under the Influence of Surface Water.

pit would have been less than 1,100 feet from the closest Eudora well. After learning that the city would oppose the issuance of a conditional use permit for this pit, the application was withdrawn.

Penny's Concrete Company

In 2012, another off-stream sand dredging operation was proposed by Penny's Concrete Company. While this pit was proposed to be farther away with the potential edge of the final pit being about 7,500 feet from the closest municipal well, information was provided that a thick bed of gravel would be exposed on the sides of the pit below the water surface. The location of this pit was also in the City of Eudora Wellhead Protection Area.

Eudora response

Logs of completed wells in the area indicate that there are layers of large gravel in the aquifer, and one such log describes 15 feet of "large gravel". If the size of the material in these beds is accurately described, and if the material is well sorted (meaning that small to medium sized grains of sand do not fill the pore spaces), the velocity of the water flow through these layers could be exceptional under the "right" conditions. This flow could be so exceptional that relatively no filtration is provided and that the water flow could be measured in many hundreds of feet per day or more. The applicant's consultant provided information that the flow direction of groundwater in the aquifer was such that the Eudora wells would not intercept groundwater that may be recharged from the pit, so it was unnecessary to do

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any further evaluation of the groundwater flow properties. The city's consultant and a landowner near the pit location (who also happens to hold a PhD. in Geology and enjoyed a long career of researching and teaching groundwater properties), argued that more recent data was available that suggested the flow of groundwater from the pit to the wellfield could occur. KRWA explained that if water from the pit reached the Eudora wells, and it contained biological contaminants commonly found in surface water, then regulatory agencies would likely reclassify the source of water as being groundwater under the influence of surface water. If that would happen, the city of Eudora would have to construct a water treatment plant capable of treating surface water, or purchase water from another supplier with the capacity to serve them. It was the city's opinion that until a comprehensive study was conducted with consideration of the worst-case conditions, it was unreasonable to issue the proposed conditional use permit.

The natural hydrologic conditions of the Kansas River valley aquifer is relatively simple to understand. Rainfall on the floodplain, that didn't run off directly to the river, soaked into the soil and recharged the underlying aquifer. Water from the aquifer, if it was at a level higher than the water level in the river, moved toward the lowest level of the valley which was the river, and sustained the flow even during dry times. With the upstream reservoirs now

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regulating the flow on the river, and with groundwater withdrawals from many wells within the valley, the interaction of the aquifer and the river is far from a natural state and is now much less predictable. One worst-case scenario that should be considered is one with large irrigation and municipal demand for the aquifer's groundwater.

Lowering of the water table by high-capacity wells can significantly reduce the discharge of groundwater into the river. If these high-capacity wells are operating at the same time that reservoirs have created a bank-full condition on the river, the river could then be a significant recharge source. A pit, close to a nearly flooding river, that is directly connected to the aquifer probably would have a significant contribution to the aquifer. If there are constituents commonly found in surface water being introduced to the aquifer, a public water system's source of supply should be considered to be under the influence of surface water.

Conclusion (if possible!)

At the first hearing on this matter at the joint meeting of the Eudora Planning Commission and the Lawrence-Douglas County Planning Commission, the Eudora Commission voted four to one to recommend denial of the conditional use permit. The Lawrence-Douglas County Commission voted 4-3 to recommend approval of the conditional use permit. The Douglas County Board of Commissioners heard the matter a month later but was

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uncomfortable deciding if one consultant was more correct than another. Before ending the meeting at 11:45 P.M., the County Public Works Department was asked to find another independent consultant to review the reports and give the commissioners a third opinion on the project.

In the meantime, it was discovered that some of the parties which were required to be notified of the original planning commission hearing did not receive their notification. The matter of the conditional use permit was returned to the Lawrence-Douglas County Planning Commission and the hearing was reopened. The third-party consultant explained that it was impossible to choose which of the various groundwater flow predictions was correct based on the very limited information available. The consultant explained that they would need approximately three months to determine how long a comprehensive evaluation might take, but that a year of data gathering was probably the minimum. The city of Eudora City Administrator stated that a conditional use permit should not be issued until the study was completed showing that the proposed pit would not affect the groundwater quality of the wellfield. Local residents raised issues about noise, mobilization of contaminants, traffic, the permanent loss of prime soils, lack of groundwater data and the appearance that the pit owner would have no liability for any problems created by the pit. It was stated by one resident of Eudora that it would be unfair to the residents of Eudora to pay for a

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new water treatment plant if the pit caused one to be required. One resident asked a rhetorical question regarding wellhead protection if the pit was in the protection area. He saw no evidence that any consideration was being given to this.

At the end of the hearing, the Eudora Planning Commission voted four to none to recommend denial of the conditional use permit application. After discussion and explanation of how they would likely vote, the Lawrence-Douglas County Planning Commissioners voted on a motion to defer the application for a period of time to review the coming report of the third-party consultant. This motion failed. A motion was then made to recommend denial of the application to the Board of County Commissioners and it passed four to three. The Board of County Commissions is scheduled to make a final decision on February 27, 2013.

One of the reasons given by one commissioner for voting for denial of the permit was that the current comprehensive plan identifies five locations for potential sand pits in Douglas County. Without knowing if any of those four locations are better than the proposed one, a vote for this location was not possible.

The city of Eudora (and the other public water systems along the valley) didn't win anything in this fight, even if Douglas County denies the application. If anything, the fight for resources was only moved to a different battlefield. If the next proposed sand dredging operation doesn't

negatively affect some public water system's water supply, the next one after that probably will. These alluvial groundwater supplies must be protected, if water systems want to operate as they have in the past. The smaller groundwater systems without surface water treatment capabilities have the highest vulnerability to losing their inexpensive water supplies.

KRWA is ready to be of assistance to any community or water district to help evaluate potential sources of contamination to their groundwater supplies. Give us a call or you may email me directly at dhelmke@krwa.net.

Douglas S. Helmke has been the Water Rights Tech at KRWA since June 2000, and also a Wellhead / Sourcewater Protection Tech since 2003. He holds professional geologist certification in Kansas and Missouri. Doug received a B.S. degree in geology from Kansas State University.



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