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City of Burr Oak, KS Jump-Starts Source Water Protection Program

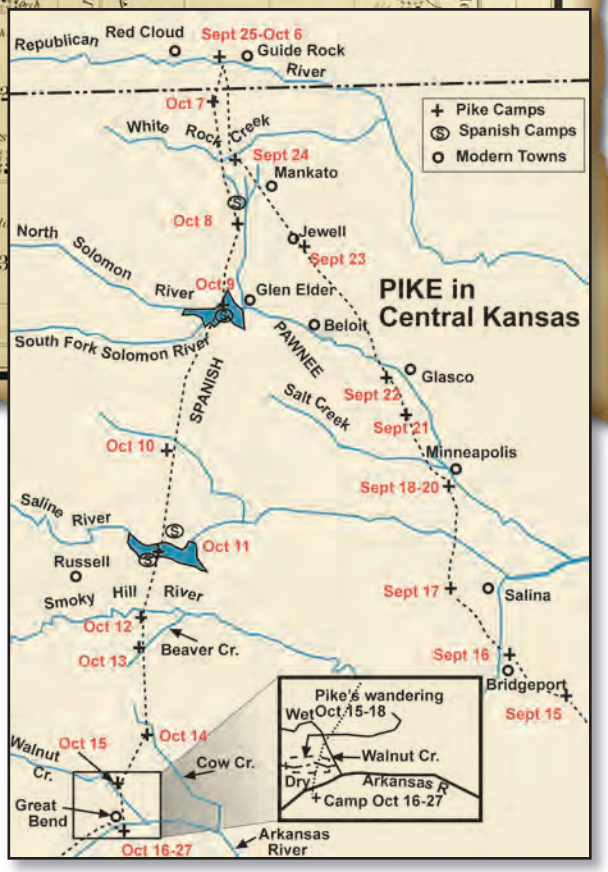
Funding provided through the United States Environmental Protection Agency, under the Clean Water Act's Section 319, commonly referred to as Non-Point Source Pollution Control Program, is going to help the city of Burr Oak, KS jump start a source water protection program. The Kansas Rural Water Association will be providing assistance to ensure that results occur.

Burr Oak is a community in transition. Then again, what community isn't? Water doesn't stand still; nothing else does either.

Burr Oak is located in Jewell County in north-central Kansas. Jewell County was settled by Europeans, in a permanent manner, in 1870. There were earlier attempts but hostilities between the Sioux, the Pawnee and early settlers delayed the establishment of the county government for a few years.

The first person of European descent to visit the area that became Jewell County was Capt. Zebulon M. Pike, Jr., during his Southwestern Expedition. It is believed that he camped on the banks of White Rock Creek near the present site of Burr Oak on September 24, 1806. Approximately two months after camping on White Rock Creek, Pike would attempt to climb the mountain that bears his name, Pike's Peak.

Consider what the climate was like in 1806 if Capt. Pike attempted to climb Pike's Peak in November! Was there no snow, or did Pike disregard it? Pike's descriptions of western Kansas, after turning west near the present site of Great Bend, was likely limited to what he saw along his route along the Arkansas River and its areas of sand hills or dunes. Seeing these hills of sand, mile after mile, and mentioning in his notes the lack of timber probably perpetuated, if not started, the myth that the Great Plains was the Great American Desert.



This map shows the route of Capt. Zebulon M. Pike, Jr.'s Southwestern Expedition through central Kansas in 1806. Pike would later try to find the headwaters of the Red River (the "southwest corner" of the Louisiana Purchase) in Colorado, but failed. The headwaters of the Red River is actually in what is currently Curry County, New Mexico, very close to the Texas Panhandle. *(Source: http://www.zebulonpike.org/pike-in-kansas.htm)*

Short water supplies

This wellhouse sits over a portion of 100-year-old Well No. 1, which continues to supply water to the Burr Oak water dock.

This structure is the wellhouse for Well No. 6 and the chlorination building.

Jewell County, Kansas is not overly blessed with an abundance of groundwater. Only 26 water rights for irrigation existed in September 2012, authorizing only 31 wells. The aquifers in Jewell County include the Dakota Formation, which is used by some domestic users in the southeastern part of the county. The Meade and Sanborn Formations are younger deposits that contain sand, gravel, volcanic ash and limestone pebbles. These deposits can be found in previously formed valleys that have been filled with these previously mentioned materials. One particularly thick and well-saturated portion of one or both of these formations is found in the northeastern corner of the county where the ancestral Republican River cut a channel. Many if not most of the 31 Jewell County irrigation wells are located in this buried valley. Alluvial (stream-deposited) aquifers are also present along creeks and rivers, and nearly all of the remaining irrigation rights utilize the alluvium of the Republican River. The city of Burr Oak has wells in a similar kind of formation which are older than the alluvial deposits. The wells are in a terrace formation which is in contact with the alluvium of White Rock Creek. Terraces are older floodplain deposits which typically remain on the flanks of a valley, after a period of downcutting and new floodplains creation by the stream. The water table may be at the same elevation where a terrace and alluvial deposit are in contact, depending on the composition of both deposits.

Historically, the city of Burr Oak experienced a much greater population than it presently has. The population of Jewell County peaked in 1900 with approximately 19,420 persons, after having only 270 persons in 1870. The city of Burr Oak's population in 1910 was 746. In 1960, the population was 473; in 2010, the population was 174 persons. While a quick look at the numbers say that the population of Burr Oak has decreased significantly, the numbers do not say anything about the community's resolve to move forward. The reduction in population is not unique to the city, as the 2010 Jewell County population is estimated to be 3,077, a greater percentage decrease.

The Kansas Water Appropriation Act was passed in 1945; it created a formal process to allow water rights to be developed. The Act also allowed for previously-existing water rights, established under the law that was replaced, to be recognized in the new appropriation system. When a city made a claim for a vested water right, that city was asked to provide information about the wells, pumps, water storage tanks, etc., and the number of persons that were served by the system. The city was also asked to estimate the greatest quantity of water used by its customers in one year prior to 1945. The Division of Water Resources stopped accepting claims for vested rights for non-domestic water rights in the early 1980's, as most of the valid claims had been filed, and the very few that were being claimed were based on memories created at least forty years earlier.

The city of Burr Oak has a vested right for municipal use, and one of the original wells described in the Vested Right Order (or vested water right) is still authorized. Well No. 1 was reported to have been dug in 1912, one hundred years ago! Well No. 2, according to the claim, was drilled in 1935, probably after concerns that the drought of the 1930's might

KRWA Technical Assistant Doug Guenther investigates the area where Well No. 3 once existed. No open hole or ground settling was observed which could indicate that it was not properly plugged.

Well No. 7 is protected by welded steel pipe, fencing and a large concrete pad. Additional protection measures for wells 1, 6 and 7 will be identified and implemented.

make cause Well No. 1 to go dry. Through the years, wells 2 through 5 have come and gone, and the city of Burr Oak now relies on wells 6 and 7. Well No. 1 is not connected to the distribution system at this time, but remains authorized under the water right as a standby well for emergency use if necessary.

This historical, geological and social information about Burr Oak has been provided to explain the workings of a grant awarded to Kansas Rural Water Association to implement source water protection in Kansas. A number of public water systems with possible threats to groundwater source quality have been identified, and the challenges that Burr Oak has will be used to explain the program.

When participation with this program was being contemplated, Association staff considered the known threats to the quality of source water for various water systems.

The Kansas Department of Health and Environment had a grant program which provided cash to make reductions of non-point source pollution. This program was called the Clean Water Neighbor Program (http://www.kdheks.gov/nps/cwn.htm). Because of the funding challenges that exist, this program has being suspended, but there are hopes that new funding will be available in the future. However, Kansas Rural Water Association was fortunate to propose a project that would provide assistance to seven public water systems in Kansas while the program was active.

When participation with this program was being contemplated, Association staff considered the known threats to the quality of source water for various water systems. After identifying those public water systems, the systems' willingness to participate in this program with Kansas Rural Water Association was determined. Those water systems that indicated interest, and had the potential to implement source water protection measures, were chosen to be partners in the grant. The city of Burr Oak is one of these partners.

While the typical source water protection process starts with naming a committee to oversee the project from start to finish, the grant application process jumps ahead with

The United Methodist Church in Burr Oak is more than a century old; it has been named to the National Register of Historic Places and as a State Historic Site.

identifying the possible solutions that can be implemented before doing the inventory of contamination sources, etc., so that the partners can be identified. Now that the grant has been approved, KRWA will visit each water system to start the process in the usual manner:

1. Name a source water protection committee.
2. Determine the area contributing recharge (and contaminants) to the aquifer.
3. Inventory the protection area for potential contamination sources.
4. Identify the implementation measures to reduce and eliminate (if possible) the potential contaminants from entering the aquifer.
5. Write and adopt the Source Water Protection Plan.
6. Implement the identified protection measures.

In the case of Burr Oak, three implementation projects were identified in the approved grant application. They are:

1. An educational program to educate the owners of possibly existing on-site wastewater (septic) systems on the proper methods to maintain and operate said systems.
2. An educational program to educate the owners of adjacent cropland to explain the threats posed by the use of agricultural chemicals. The benefits of grassed buffer strips between the wells and the cropland will also be explained and if possible, installed.
3. A project to determine the adequacy of past well plugging attempts for wells 2, 3, 4 and 5, and to determine that Well No. 1 is not contributing surface water or shallow groundwater to the aquifer.

Similar implementation strategies are identified for the other water systems and hopefully, the evaluations of the inventory process will support the initial grant funding projects.

The funds provided by this grant are from the United States Environmental Protection Agency, under the Clean Water Act's Section 319, commonly referred to as Non-Point Source Pollution Control Program. Water systems participating in this project are expected to match 50 percent of the funding.

As of September 15, 2012, I have made an initial visit to the city of Burr Oak to introduce myself to the mayor and the operator of the water system, and to better understand the wells and the potential protection area. An old domestic well in a soybean field near the city's wells was identified on this visit. While there are significant challenges to implement all of the necessary source water protection measures, some of which probably haven't been identified yet, the city of Burr Oak will demonstrate its resolve to move forward, with the cooperation of all of the stakeholders.

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