

GPS Mapping Should Be More Than Just Printing New Maps

Rural water districts and small cities are relying on GPS mapping more and more each year as a valuable technology to help locating system infrastructure. Taking the first step by deciding to invest in a GPS mapping project is great, and a step in the right direction, but I have noticed in the past few years, there is an opinion by the local systems that there shouldn't be that much work involved for the city or RWD. Most of the time this because system personnel and governing body members being unaware that if a waterline does not have any GPS positions taken on it, then it is a complete guessing game on KRWA's end drawing it in.

I realize that there are miles of water lines throughout the state that simply will not be located until a leak is found, or that line is replaced. Systems however should realize the complexities of taking on a GPS mapping project. KRWA has a process for GPS mapping that, in my opinion, is very effective, and just like anything else, you get out of it what you put into it.

There's a process . . .

The first step in the KRWA mapping process is data collection. As I've stated in previous articles, system personnel should have as much of the infrastructure located as possible prior to KRWA's arrival. Doing so saves the system money by reducing the time required for data collection. Any water lines with tracer wire or visible trench lines should be located as well because tracer wire may not work forever and that visible trench will disappear some day. Meters, valves, cleanouts, and everything else associated with the system will also be collected. The more data points that can be collected, the

more information the system will have for future use.

Data interpretation is the next step in the KRWA mapping process. KRWA post-processes the data to validate the accuracy. We then import the files into the mapping software and begin drawing in the water lines. We typically refer to any existing maps to help better determine how the pipelines, valves, etc. are connected in the water system. If enough data is collected, then the old as-built maps might not be so useful. After the "dots are connected", we print a set of check plot maps, or rough-drafts, and provide those to the city or RWD for their review.

Reviewing of check-plots, being the third step in the KRWA mapping process, is the most crucial step. For some reason, this step seems to often be put on the backburner by the utility personnel. The review of the check plots means finding and noting any changes that need to be made so that final maps can be printed. If there is a water line crossing the road in the wrong location, then the review of the check plots should note that. The check plots are printed with an aerial photo background making it easy for anyone with any knowledge of the system to find errors. There have been instances where check-plots have been returned to KRWA without any corrections written on them, and the operator says: "They look good, go ahead and print the final maps." Well, it's not practical to assume that a KRWA employee who has only been to that system for a week or two can draw up an accurate set of maps for that system on first attempt. The reason to conduct GPS mapping is not to just put new lines on new paper but to make the mapping products

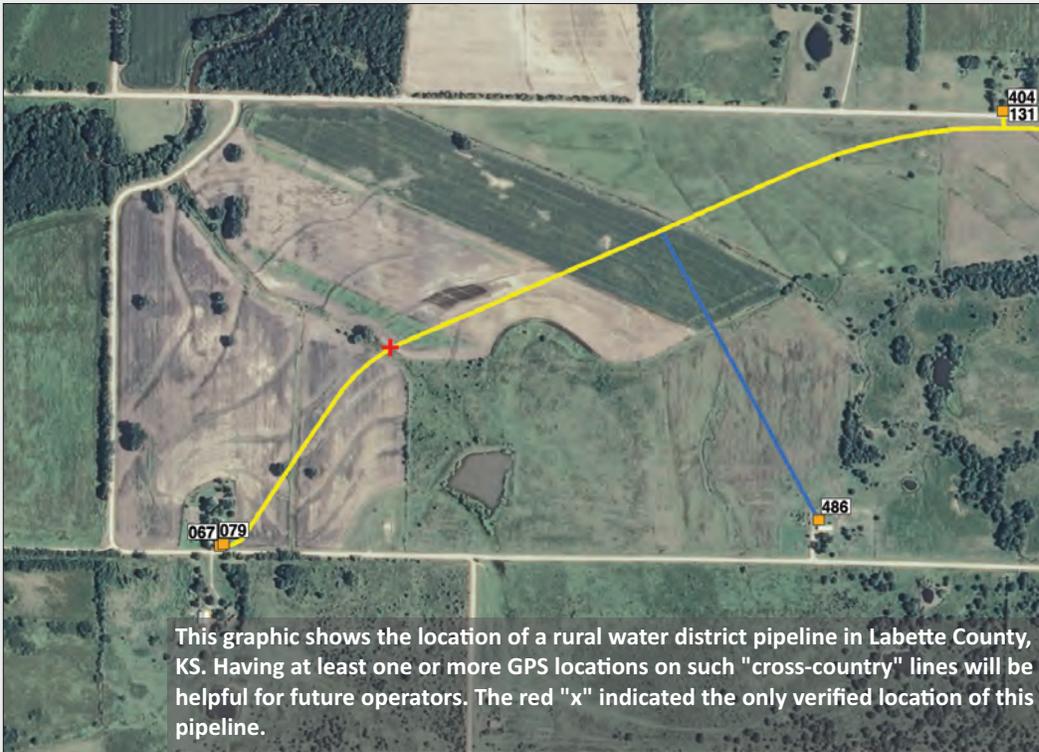
The reason to conduct GPS mapping is not to just put new lines on new paper but to make the mapping products more accurate.

more accurate. Many "as-built" maps have much to be desired as far as accuracy is concerned.

Ask for help

Systems should involve anyone who might know the locations of pipelines, etc. in the mapping process. It's not unreasonable to take the check plots to landowners, or other contractors, former operators or board/council members to ask for their help in pinpointing the actual locations of pipes, valves, etc. If they don't feel confident enough within a few feet, or to have a GPS position collected on it, but can pencil it in more accurately than the existing map shows, then at least future operators and board/council members will have that much of an advantage. Even if a system operator knows of one leak that he fixed on an old line that runs on an angle across a pasture, it is a good idea to collect a GPS point there. That one GPS point gives a future operator something to work with. Every road crossing sign, or sign in the fencerow should have a GPS point collected if possible. Create a list of certain spots that still need collected. Exhaust every resource possible on question areas of the system. Putting the system's best efforts while correcting these check-plots will be reflective in the final product.

The Kansas Water Office offers a subsidy program that will reimburse projects up to \$4,000 of the total cost of GPS mapping, or fifty percent, whichever is less.



This graphic shows the location of a rural water district pipeline in Labette County, KS. Having at least one or more GPS locations on such "cross-country" lines will be helpful for future operators. The red "x" indicated the only verified location of this pipeline.

After receiving the check-plots, KRWA then reflects these corrections into the mapping program. We will then call the system and set up a time to travel there and conduct final corrections, which is the fourth step in the KRWA mapping process. During

that visit, we again review all of the check-plot pages with the system and make any further corrections necessary directly in the mapping software. Any additional system locations can be collected at this time as well. Upon completion of this, the

system will order however many map products that they wish to have printed. KRWA has established a price of \$5 per page for high resolution, color map book pages. Mapbook page sizes are typically 24" x 18". Wall maps are \$75 per map, and are normally 42" x 42" but can be as large as 84" by 84". Overview maps are \$15 per map; these are very handy, typically laminated for fast, overall reference by the city or RWD. An overview map size that KRWA prints is normally 24" x 30".

KRWA is excited to help cities and RWD evaluate their options on improving their mapping products. Give KRWA a call at 785.336.3760 or email me at mark@krwa.net and I'll be pleased to schedule a meeting with your board or council to discuss the challenges and expected outcomes. It's an investment that the State of Kansas has decided will be beneficial too as the Kansas Water Office offers a subsidy program that will reimburse projects up to \$4,000 of the total cost of GPS mapping, or fifty percent, whichever is less. KRWA or the Kansas Water Office staff will be pleased to provide assistance with the subsidy application.



The red "x's" indicate the only known locations of this segment of rural water district pipeline. Having the road crossings GPS'd will be an advantage to future road maintenance or operation of the rural water district.

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