



Challenges of Developing and Implementing Improvement Projects

In recent months I have visited with several systems that are finishing some major upgrades to their wastewater collection and treatment facilities. Many other communities are in the process of developing a new project. All of these projects are likely to encounter some problems as they develop or are constructed. My intent in this article is to try to help cities and other wastewater utilities avoid large issues concerning the evaluation and determining how to proceed with a project. KRWA has a wonderful handbook as part of the Water Board Bible series entitled Getting Results From Your Experts: Engineers, Attorneys & More that would also be an excellent resource.

There are systems that have constructed projects every couple years and there are those that haven't had a project since their system was built thirty or more years ago. The council and staff often have no idea of how to proceed; it's those systems that I'm hoping will find this article helpful. So, let's start from the beginning and work towards the end of a project.

What improvement needs to be made?

Frequently, the consideration of the improvement is spurred by an order from the Kansas Department of Health and Environment or EPA. The superintendent or operator and the board/council should sit down and discuss the issues and get a general idea of how to correct the problems. This should not be a "blame game" aimed at the governing body or the operators for not doing their job. Most shortcomings develop over of a long period of time and typically are not the fault of one person. So let's assume that the discussion gets past the blame game and the group debates what needs to be done, who to hire as a consultant and last, how will the project be paid for. KRWA can assist with the question of what needs to be done – and yes, there generally are other options. KRWA has provided assistance to systems by suggesting options that no one else thought of or did not believe were even possible.

The first question that must be answered is if the project is needed – in other words, is the project that is being

proposed going to address the problems? If the project involves repairs to the collection system, then list the options including the following: 1) smoke testing; 2) cleaning the lines; 3) video-taping; and, 4) inspecting manholes. If the project is not needed immediately, then work on this over several years and pay for it from the utility fund. If there's an order to make an improvement, then these items can be included in the engineering review. Estimated costs can be obtained by contacting service providers for other similar bids; KRWA can also provide referrals to other systems that have experienced similar projects. So that's the basic idea; first, make a list of the issues and ways that those can be addressed. The goal is to not end up obtaining a loan for the collection system only to have a bigger need in the treatment system.

Selecting an engineer

Having decided on the general scope of a project, it's now time to hire an engineer. But how do you select an engineer if you've never been involved with a major project? There are a couple of ways to hire an engineer. The

first is to submit a letter to several firms, generally at least three, for a “Request for Qualifications” (RFQ). Your letter asks those firms to provide a reply with their possible interest in your project and second, to provide their experience such as a listing of referrals of similar projects. Once received, the owner ranks the firms and generally will interview several of the firms. Another way is to ask for a “Request for Proposals” (RFP) that would include an estimate of the costs.

Once the engineer is hired, the design is underway. And please note this: any information or plans that the owner provides to the engineer should be returned in good order. As part of the design the engineer should be in contact with the operator, walking through what needs to be done and explaining any lines or connection that may not be on existing maps or plans. If possible, involve any prior operators in the discussions. I have heard of water lines and sewer connections that were not included in the project because there was no discussion with the operator. These missed connections caused change orders and added costs to the project.

Another issue is that sometimes the engineer will bring in the plans when partially done and ask the board or council “look the plans over”. While I don’t intend to offend the board or council members, but most do not have any idea of what they are looking at nor do they have the time to go over the design. Questions should be asked if members of the council or board do not understand part of the plans. It may be appropriate to take the plans and go with the engineer and do a walk through to discuss the project at the site.

I believe one of the most important goals concerning design is that the owner gets what is needed and wanted. I have seen projects that are “Cadillac” when many of those bells and whistles are not necessary. What kind of building is really needed? Is it going to be brick with fancy columns? Why? Cut these costs to only needed expenses. I know I would rather have a building large enough for the equipment and storage than a smaller one that looked fancy on the outside but was

Trade-offs make all the difference

It’s not simple to decide on an RFP or RFQ when you need a new engineer. Here are some major issues for your system to consider:

Pros

Cons

RFP

1. Provides project details, especially scope of work.
2. System gets tailor-made project ideas.
3. Engineer analyzes project thoroughly.
4. Relatively easy to compare responses.
5. Engineer must respond to all sections.

1. Takes much more time for system to prepare.
2. Engineer’s time to prepare will be included in fees.
3. Some engineers are too busy to respond.
4. Takes board/council time to compare responses.
5. Tempting to select engineer on price alone.

RFQ

1. Easy and quick for system to prepare.
2. Can ask for speedy responses.
3. Likely to have high response rate.
4. Interviews help in making selection.
5. Emphasizes qualifications, experience.

1. Not enough project information is provided.
2. System gets little tailor-made information.
3. May get responses from poorly-qualified firms.
4. Interviews take extra time.
5. Little from engineer on project approach.

From *Getting Results From Your Experts: Engineers, Attorneys & More*, 1998, by Kansas Rural Water Association.



WILSON & COMPANY

- Reuse Systems
- Water Treatment & Distribution
- Wastewater Treatment & Collection
- Asset Management
- Modeling
- Rate Analysis
- Funding and Grants Assistance

1700 East Iron Ave.
Salina, KS 67401
phone: 785-827-0433
fax: 785-827-5949
www.wilsonco.com

so small you could not bring a truck in to do maintenance.

Make sure that your system owns the designs and has the right to copy the plans as you see fit. I have seen recently that the plans say something similar to “these plans are property of ABC engineering; no copies may be made without expressed consent.” If the system paid anything for the design, then the system should own the design and plans they paid for! I wonder if there has ever been a court case on this issue?

By the time the design is completed, hopefully everyone will understand what the project involves. With some projects the cost estimate may be higher than the system can afford – or is willing to pay for. With this in mind you may want to have a base project. This will meet MINIMUM design criteria of the project. “Alternates” can be added to the base project when bidding. For example the project may be changing the structures at the lagoons to reduce short-circuiting and dredging sludge as the base bid. But there is also erosion of the dikes that will need to be addressed in the future.

Make sure that your system owns the designs and has the right to copy the plans as you see fit.

Adding erosion control as an alternate to bid will allow for this to be done if the base bid comes in under estimate and funding is available. Alternates should be listed in priority of need.

Depending on the project, sometimes a substitute or an additional item can also be bid as an alternate. If the base bid comes in below the estimate, it may be possible then to add the alternate. Without having the alternate as a bid item, some funding could be lost. By the same token, water and wastewater system owners should not get the impression that all the money has to be spent if the project comes in below estimate.

Local or residential inspector?

Who will be the inspector on the project? A qualified inspector is needed for most large projects; the engineering

firm can provide that person or the project owner likely can hire their own inspector. Depending on the complexity of the project, the owner may be able to have the operator or someone from the system be the inspector. Make sure that whoever is the inspector knows what needs to be checked. I’ve seen many “certified” inspectors sitting in their vehicles reading magazines and they only get out when the engineer or someone from the system is around.

I have met many good inspectors during my work with KRWA. Good inspectors let the operators know what is going on; a good inspector obtains input from the operators, etc. Good communications between the inspector, the owner, contractor and engineer are key to making the project move smoothly.

After the bids have been let and the project has been awarded to a contractor, make sure that the owner’s representative attends all meetings throughout the project. Sometimes there will be no subcontractors or in cases, there may be several subcontractors. Remember the subs are under the general contractor’s contract responsibility to do the job correctly. Any issues with the sub need to be discussed with the general contractor or the engineer. Remember the engineer is the system’s employee; the engineer is not the project owner. Working hours and dates such as weekends and holidays should be set out in the contract. Any changes need to be discussed and made with change orders so there is no question as to what work hours are allowed. It’s not realistic to suggest that contractors cannot work on a project if the inspector is only there from 8 a.m. to 5 p.m., five days a week.

Prior to construction, I suggest making a video diary along the path of the project and of areas where construction will take place. This may reduce or eliminate liability claims from irate property owners trying to get new sidewalks, a new driveway, or new

MA Miller & Associates
CONSULTING ENGINEERS, P.C.

WATER ENGINEERING SERVICES

- ▶ **WATER/WASTEWATER:**
Design, Treatment, Storage, and Evaluation
- ▶ **SITE DEVELOPMENT:**
Platting, Re-Zoning, Grading, and Utility/
Pavement Design
- ▶ **ENVIRONMENTAL:**
Chemical/Biological Waste Treatment, Phase
I & II, and Remediation
- ▶ **SURVEYING:**
Topographic, Construction, GPS, and Route
Surveys

Office Locations:
Colby, KS
Grand Island, NE
Holdrege, NE
McCook, NE
Kearney, NE

1111 Central Avenue | Kearney, NE 68847 | 308.234.6456 | www.miller-engineers.com



Wastewater utility improvement projects often include pipelines, pumps, lift stations and as shown above, control buildings. This photo shows the office building with lab and headworks; the photo was taken at the city of Alma on their project in 2010.

landscaping. I was involved in project where no documentation of the original terrain was prepared. In this case, even though it was generally known before the project that a private driveway was in poor condition, the property owner claimed the contractor drove over it with heavy machinery and broke it in several places. Without documentation of the original conditions, the contractor paid for new drive. On another project a church allowed the contractor to use their parking lot as a base for equipment. As part of easement for a sewer line to cross the church property, the city provided overlay of the church parking lot when the project was completed. With the cost of the overlay being minimal to city, and having a contractor close to the work site, this arrangement was win/win for everyone involved.

Operable easements are critical

Easements are a pet peeve of mine. When I was on the city council in Marysville, we did many projects, but it was one of the first we did that made me very aware of how difficult things can become without easements. We had the project designed, the contractor was hired, equipment and materials were onsite; everyone was ready to start. But we could not start. That was because we did not have the easements yet! Bids should not be let until the easements have been obtained. When easements cannot be obtained, change orders and redesign of the project are

very real possibilities and those will likely increase costs. And if you are going to obtain easements, go talk to the landowners; don't have your city or RWD attorney mail papers out expecting landowners to sign easements without communications from the owner. These landowners are neighbors to the board or council members; those landowners and the board/council members will be living in the community long after everyone else has ended their involvement with the project.

Substantial completion

After the project progresses, there will be a time when the engineer will suggest that the project is substantially completed. Such a determination generally triggers payment of the retainage of project costs. My suggestion to never agree to that unless everyone is completely satisfied with the project. Another issue is that the date of the statement of substantial completion starts the warranty period. Most warranties are for one year. The owner should document when parts of the project are substantially completed. When the project is completed, the owner should do a walk through with the inspector, general contractor and engineer and make sure any issues are addressed. As part of the contract you may want to include post inspections at six months and eleven months to make sure any problems are taken care of or listed before warranties expire. It

should be the owner's responsibility to make sure any problems are brought to the attention of the contractor and engineer.

The engineer should also provide the owner with "AS BUILT" plans that show exactly how the project was constructed. The owner should require at least three hard copy sets and one electronic copy of the plans. The drawings should include any inspection information and pictures.

Here are some of what I believe are the important highlights of this article.

1. Make a list of priorities the owner believes need to be addressed before hiring an engineer
2. Make sure the engineer involves the operator and council or board in the design and maintains good communications with the owner; the owner should make sure the engineer is responsive
3. Obtain all easements before going to bid
4. Make sure the inspector is qualified
5. Do a walk-through of the project sites making video/ picture diary prior to starting the project
6. Try to encourage the general contractor to maintain the same foreman throughout the project
7. Keep track of the dates for substantial completion and full completion; report any issues to keep warranties valid; conduct follow-up inspections at six and eleven months
8. Receive the required number of "AS BUILT" plans as well as an electronic file; do not forget to have any plans and information that may have been provided to engineer at beginning of the project returned to the owner.

Charlie Schwindamann has been Wastewater Tech at KRWA since September 1999. Charlie holds Class II Water and Class I Wastewater Operator certification. He is a former member of the Marysville, KS City Council.

