

Before saying “yes” to new industry, small towns need to evaluate effects on utility services

Imagine you are the mayor of a small town in Kansas. The population of your town has been declining slowly over the last 20 years. You have lost your local school and are afraid the Post Office may be next. An out-of-state individual who wants to start a new industry in your town has approached you. This new business may employ as many as 40 to 50 people full-time with good benefits. You see this as the “shot in the arm” your community has needed for many years. It will create new and good-paying jobs, increase tax revenues and improve the overall economic situation in the area. You already know your water supply has sufficient capacity to serve the new industry. However you are a little more than unsure if your existing two-cell lagoon which was built 30 years ago, is sufficient to handle sewage that will be generated by the new industry.

The intent of this article is to help elected officials deal with a situation like I described above. I want to provide guidance on what issues need to be addressed and what questions should be asked before making a commitment to provide sewage service to such an industry. Unfortunately, some small communities do not always make a thorough evaluation before agreeing to provide such service. That can result in overloading the city’s lagoon and cause odor problems. Those problems can become compliance problems with the Kansas Department of Health and Environment (KDHE); solutions to solve those problems may be expensive.

What’s in that wastewater?

One of the first questions that the city must answer concerns the quality and quantity of wastewater to be discharged to the city by the new



The city of Bern’s three-cell lagoon receives wastewater from a local dog food manufacturer after pretreatment. The pretreatment system consists of a covered anaerobic basin followed by a mixed, aerobic basin and settling basin. Sludge must be periodically removed from the anaerobic basin and disposed of properly. In the past, the city has land applied the sludge.

industry. It is possible that the new industry will not generate any process wastewater. The only wastewater generated may be from bathroom facilities at the plant. If that is the case, the additional loading may not present any problems.

However, if the new plant will be generating wastewater from their manufacturing process, the city needs to know how much. The city also

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needs to know what pollutants the wastewater will contain and at what concentrations. It is important to note that many industries produce wastewater that has a much greater organic loading than regular domestic wastes. Wastes generated by businesses such as butchering operations, cheese making, milk processing, truck washes, dog food manufacturing and some restaurants are usually much higher in oxygen demanding pollutants than domestic wastewater. For example, most domestic waste has a biochemical oxygen demand (BOD) concentration in the 200-300 mg/l range. However, blood from a locker plant or whey/milk wastes from a cheese or milk plant can have BOD’s in excess of 3000-5000 mg/l. Treating such wastes can present real problems if the city has a lagoon system. Operational adjustments can usually be made in most mechanical plants to handle such wastes. However, lagoons can be overloaded quickly if such high-strength wastes are discharged.

Seek counsel and advice

In situations with high BOD wastes, it may be advisable for the city to retain an engineering consultant to help the city determine if the collection system and lagoon are capable of adequately handling the additional wastewater. Industrial wastewater can contain a significant amount of solids that can plug sewer mains and lift station pumps. Industries that produce such wastewater are usually required to provide screening to remove large solids before discharging to the city. An engineering consultant should also be able to calculate the current organic loading on the lagoon and how much, if any, reserve capacity remains. Estimates can then be made on the additional loading from the new industry to determine if the lagoon will require immediate upgrading or not. Another good source of information is from similar type plants in other cities. The proposed industry may even have a similar facility in another city. If so, the city's engineer should obtain data on quality and quantity of wastewater generated at that location and use it for making estimates.

Another source of assistance is KDHE. Some industries are required by US EPA to have a Pretreatment Permit issued by KDHE. These permits

usually require monitoring by the industry. They also contain permit limits that must be met prior to discharging to city sewers. I suggest contacting the KDHE Industrial Programs Section in Topeka for guidance regarding any Pretreatment Permits that may be required. The phone number is 785/296-5547

Develop or review the Use Ordinance

Finally, the city should review the city's Sewer Use Ordinance. That ordinance should provide some criteria regarding the quality of discharges to the city sewer. Many cities do not realize they have such an ordinance. However almost all cities have one as it is usually required prior to securing any financing of system upgrades through KDHE. In short, if the wastewater system has secured a KDHE loan or grant during the last 30 years to upgrade its sewage system, that utility likely has such an ordinance. Also, a Sewer Use Ordinance is usually not the ordinance that sets sewer rates. Rates are usually stated in a separate ordinance.

A well-written Sewer Use Ordinance can be very helpful in establishing an agreement between the city and industry prior to providing sewer service. It should establish limits on what wastes can and cannot be discharged to the

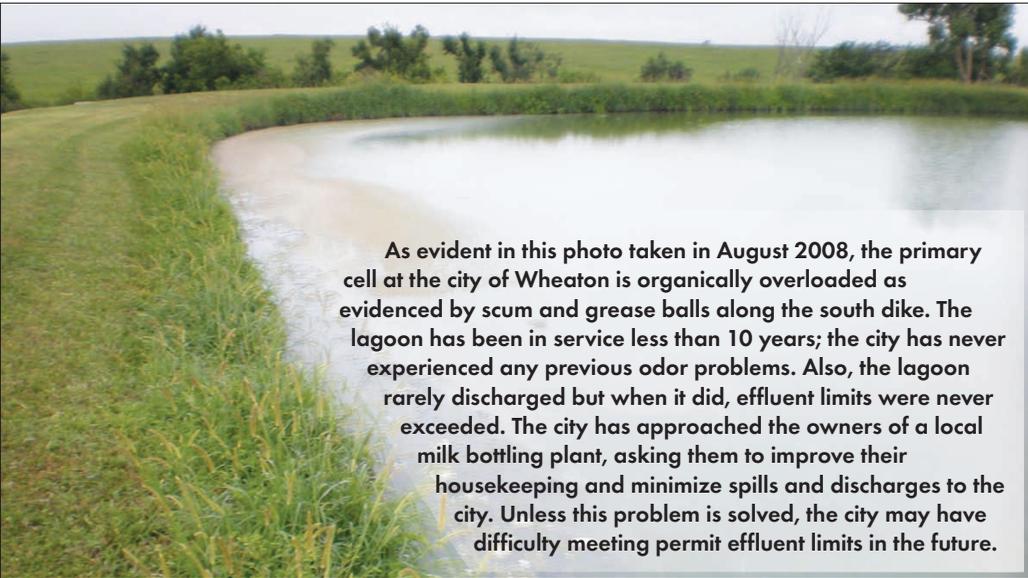
city. A maximum BOD and TSS limit are usually found in the ordinance. It typically contains a clause that limits or prohibits the discharge of wastewater that can damage or interfere with operation of the collection or treatment systems. The ordinance also prohibits the discharge of wastes that are toxic, flammable, explosive or corrosive. It also typically prohibits allowing storm water to be discharged to the city's system. The ordinance may also require the installation of mud traps, grease traps or oil/water separators if warranted. It also requires the owners of such devices to properly operate and maintain them on a routine basis.

For those cities that currently have problems with their collection and treatment systems due to treating industrial wastewater, options are limited. The city should first meet with the industry and discuss options to limit or even eliminate the discharge. Improved housekeeping is usually not expensive to implement and can make a huge difference. Occasionally the solution can be very simple and obvious. In the case of butchering operations, have the owner contain most of the whole blood in barrels during the slaughtering operation and recycle it. If only minor amounts of spilled blood are washed down the drain during cleanup, fewer treatment problems are created. This also applies to milk and cheese processing. Limiting the amount of whole milk that is spilled can help minimize problems.



Approximately 20 years ago, the city of Seneca added a pre-aeration basin to the city's 3-cell lagoon. At the time, the city was receiving a significant amount of whole blood from two locker plants in town; the lagoons gave off odors and did not meet permit limit. The pre-aeration basin assists by decreasing very high BOD concentrations prior to the wastewater entering the primary cell of the lagoon system.





As evident in this photo taken in August 2008, the primary cell at the city of Wheaton is organically overloaded as evidenced by scum and grease balls along the south dike. The lagoon has been in service less than 10 years; the city has never experienced any previous odor problems. Also, the lagoon rarely discharged but when it did, effluent limits were never exceeded. The city has approached the owners of a local milk bottling plant, asking them to improve their housekeeping and minimize spills and discharges to the city. Unless this problem is solved, the city may have difficulty meeting permit effluent limits in the future.

And if spills occur, the plant should have a means of containing and recovering the spilled material and recycling it.

If lagoon odors are a problem, upgrading of facilities is usually needed. However several options that can be tried include:

- ◆ If the lagoon has always been operated in series, try operating it in parallel. In other words, split influent flow between two or more

cells if piping allows. This provides more surface area and hopefully will eliminate the overloading and odors in the primary cell.

Unfortunately this option cannot be used if you discharge and only have two cells;

- ◆ Add aeration. Adding surface aerators to the primary cells can help handle the inflow of high-strength wastes. Surface aerators usually work best in deeper cells,

but can be used in cells that are typically four to six feet deep. Adding aerator may require providing electrical service at the lagoon. At the onset, using aerators can also cause odor problems by “stirring up” solids in the cells. However, that should not create long-term odor problems;

- ◆ Recirculating lagoon effluent back to the primary cells. If the lagoon effluent meets permit limits, it is usually high in dissolved oxygen. It may also contain those type algae that produce the oxygen needed by bacteria to breakdown wastes. Pumping or siphoning effluent back to the primary cell may provide both.

If none of the aforementioned suggestions help, then either pretreatment prior to discharge or expanding the lagoon system is needed. Unfortunately both options require major expenditures by both the industry and the city. Both also require the services of a consulting engineer. However if the city is to attract such businesses to town, it is wise to evaluate such options beforehand.

I encourage you to attend the 2009 KRWA conference. There are numerous sessions related to proper planning and operation of both water and wastewater systems. A 5-hour preconference session on Tuesday, March 24 addresses the operation and maintenance of lagoons. Other related sessions range from SCADA systems to recordkeeping. Check the program that was mailed to you in early January; it is also reprinted in this issue. I look forward to seeing you there.

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