





With the 1,000-gallon tank installed, note the black hose for pumping out the contents into the truck to haul it away. The electrical controls and high-water alarm are also mounted on the wall.

While effluent violations were numerous during recent years, the data that was probably most alarming was the city’s influent data. Results for such data can be sporadic as it can be greatly diluted by infiltration and inflow (I&I) during wet periods, resulting in lower-than-normal BOD and TSS concentrations. And it was established based on smoke testing conducted by KRWA in the past, that Winchester has severe I&I problems – and still does. But in reviewing the city’s influent data, it was apparent that at times a significant quantity of high-strength wastewater was being discharged to the city’s collection system. For example, in June and December 2018, the influent BOD was 338 mg/L and 453 mg/L, respectively. This trend was the same for the city’s influent TSS results as well. Some quarters the data looked normal, but then there would be spikes in BOD and/or TSS, which indicated there was a source of high-strength, high-BOD, high-TSS wastewater being discharged.

My first meeting with the city regarding the problem occurred in September 2019. I met with Tony Noll, the city’s new Superintendent, and

Steve Pruett, the city’s Contract Operator. Steve is the Superintendent at nearby Nortonville and has many years of experience operating Nortonville’s water and wastewater systems. Since Tony had just begun work for the city and had no previous experience with wastewater treatment, the city of Winchester benefited greatly by having Steve’s expertise to guide them. During

our initial meeting we discussed several issues which could be causing the city’s poor record of meeting effluent limits. These included reviewing flow data to calculate the lagoon’s detention time, operation of the discharge box with multiple draw-offs, potential issues with excessive sludge in the cells and proper sample collection technique. But the issue that drew the most scrutiny was the discharge of wastewater from the local locker plant. Tony mentioned that since he had started, he had observed on several occasions, a bright red influent entering the lagoon. This was most likely due to the discharge of whole blood from the local locker plant.

In situations like this involving locker plants, I always recommend to the city or sewer district that they find a copy of their Sewer Use Ordinance and review it for limitations on what can and cannot be discharged to the city’s sewers. I have written several previous articles about the benefits of using a utility’s Sewer Use Ordinance to regulate such discharges. Please refer to the March 2010 article in *The Kansas Lifeline* for a detailed discussion about Sewer Use Ordinances. Most ordinances typically place limits on the BOD and TSS concentrations in wastewater



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discharged to the city. The BOD limit is typically around 300 to 400 mg/L with the TSS limit a little higher.

Tony and Steve met with the owner of the locker plant to explain to him the problems created by the discharge of whole blood. It is common for owners to not realize or fully appreciate the problems caused by discharging such high-strength wastewater. Based on my experience, there are usually three different options for dealing with such discharges:

1) Rely on the owner and employees to capture all whole blood drained from the carcass, collecting it in 55-gallon barrels. There are several rendering companies in the state that will pick up



**Darling Ingredients, Inc. truck loads the contents from the plastic barrels into a watertight open container truck. Blood from the holding tank is then pumped into this same truck.**

not only the blood, but also the hides, paunch, entrails, bone, etc. Cities will also usually require screens on the floor drains to keep out large quantities of tissue and fat. Occasionally this is a

satisfactory solution. However, it relies entirely on the owner and his employees to conscientiously collect all whole blood, fats, grease, etc. to ensure it's not discharged.

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Unfortunately, that doesn't always happen.

2) Require the locker plant owner to retain an engineer to design a pretreatment system to reduce the BOD and TSS of wastewater prior to discharging to the city. Such systems usually involve adding a concrete basin and adding sufficient oxygen using blowers so aerobic bacteria can breakdown the high-strength blood wastes before discharge. The disadvantage with this option is that it can be rather expensive. Expenses include engineering services, construction costs, electrical costs and costs for maintaining the blowers.

3) The last option is to not regulate discharges from customers such as locker plants and the utility provides sufficient treatment capacity to adequately treat the high-strength wastewater. The problem here is that most lagoons are not designed to treat such wastewater, even with upgrading. A mechanical plant might be better suited to treat such wastewater, but even those have limitations. And again, the expenses can be significant and sometimes not politically popular as city customers can end up paying for upgrading their treatment system due to problems caused by private business.

Fortunately, thanks to Steve Pruett, there now is a fourth option. That is disconnecting the locker plant from city sewers and routing all floor drains to a holding tank. This results in the locker plant not discharging any whole blood or even washdown water to the city's collection system. In the case of the Winchester locker plant, the owner installed a 1,000-gallon concrete tank just outside the kill room floor. Installation of the tank costs a little less than \$11,000 for materials and



**Plastic barrels are used to store all waste materials other than blood. This includes waste tissue, paunch, bone, organs, etc. These are then loaded on the same truck to be hauled away for rendering.**

**While this solution is not inexpensive, it does solve the problem and is cheaper than the other options mentioned.**

installation. The tank is equipped with a high-water alarm should the water level approach maximum capacity. The tank is also equipped with a pump for off-loading the contents. So now on days they slaughter, the owner has Darling Ingredients, Inc. arrive around noon to pump out the tank and haul the blood and other materials away. The blood and other waste materials are then taken to a rendering plant where

they are processed and converted into biofuels and various pet food additives. The locker plant averages eight loads hauled off each month at a cost of \$1400.

So far, the only problem experienced has been the accumulation of an excessive amount of fat and grease in the holding tank. The city has been adding a bacterial enzyme to help breakdown the fat and grease so it can be easily pumped when Darling Ingredients, Inc. shows up to pump out the tank.

While this solution is not inexpensive, it does solve the problem and is cheaper than the other options mentioned. It also provides a solution that is 100 percent effective, as whole blood is no longer discharged to the city. So far, the city's lagoon appears to show improvement from no longer receiving such high-

strength wastewater. During the last two quarters, all effluent limits were met. While more data is needed to positively confirm effluent quality has improved, the initial results are encouraging as the lagoon is now in compliance with effluent limits.

KRWA is able to provide assistance to wastewater utilities as a benefit of a contract funded through the KDHE and another funded through USDA Rural Development and administered by the National Rural Water Association.

*Jeff Lamfers began work for KRWA in November 2008. Jeff has more than thirty years of regulatory experience in the oversight and operation of water and wastewater systems with the Kansas Department of*



*Health and Environment. He is a graduate of the University of Kansas with a degree in Environmental Studies with an emphasis in aquatic biology.*