

Norfolk Insider

City of Norfolk, NE

www.ci.norfolk.ne.us

September 18, 2013

“All Natural at City’s Wastewater Treatment Plant”

It’s one of the most environmentally friendly activities around. Using germ eating bacteria instead of chemicals, the City of Norfolk’s Wastewater Treatment Plant takes the green route when treating the city’s three and a half million gallons of wastewater coming into the plant each day.



Marsha Louthan, lab technician, looks at a wastewater sample for protozoa counts.

Todd Boling, Superintendent of the plant, and his staff like to say that they are growing bugs out there on East Monroe Avenue. They’re not mad scientists, though. The bugs they look at through their microscopes are the kinds that get rid of the contaminants in the city’s wastewater.

“Our job is to provide the right environment to grow the bacteria that cleans the water. That includes giving them the right food, oxygen and warm temperature,” Boling said.

It gets complicated when the type of food in the water constantly changes. When an industry in Norfolk flushes out one of their lines, the wastewater coming into the city’s plant may take more bugs to break down the pollutants. Boling and his staff also need to watch that the organisms that do their work for the City are not too young so that they aren’t eating enough food but not too old that they are causing an imbalance to the system. That’s why samples from incoming wastewater is brought into the plant’s laboratory each day.

“Part of the process of cleaning the wastewater is that we have a settle cycle in which the wastewater is allowed to settle for an hour. The young bugs settle slower than the older bugs. We sample this cycle so that we know the percentage of young to old in the wastewater. We like something in between a young and old

population of organisms,” Boling said.

There are hundreds of different bugs but the staff knows how to identify under the microscope the protozoa that’s beneficial to cleaning up the city’s wastewater.

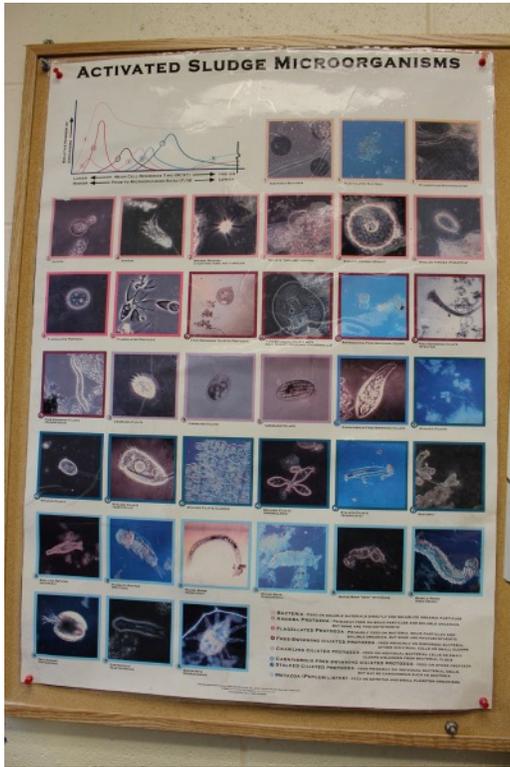
Since industry is a major contributor of wastewater, staff will sample the wastewater coming from all area industries every two weeks to know the amount of solids, organic concentration, nitrogen that will be entering the waste stream.

Once the wastewater team knows what kind of wastewater they’re dealing with they can also adjust the amount of oxygen that they aerate the wastewater with.

The purchase of three new blowers for a total of \$1.2 million was just approved by the Norfolk City Council to make sure the organisms in the water can grow.

"It takes more oxygen to grow the bugs we need to clean up the high organic content we have," Boling said.

Since the bugs can't eat the inorganic material the first step is for the grit washer to remove the grit, sand, mud and eggshells out of the water. Once a week four tons of inorganic material that has been screened from the wastewater goes to the landfill.



The primary clarifier then removes the grease and lighter solids from the wastewater. Two trickling filters are then able to remove some more of the contaminants that adhere to media made of redwood and plastic. The sequential batch reactors, large concrete structures, are where the blowers add in the oxygen so that the feeding can really begin. Some of the tanks are settling, some are mixing new with old wastewater to introduce bugs to the incoming wastewater. What settles to the bottom of the reactors is pumped out and used in another environmentally beneficial way- to fertilize area farm fields.

"The solids are tested for nutrients and we spread EPA recommended amounts on 1500 acres in Wayne, Stanton, Madison and Pierce counties," Boling said.

Once the water has been cleaned up, it goes past an ultraviolet light that destroys any E. coli (Escherichia coli) bacteria left in the wastewater and then it's ready for the Elkhorn River- discharged chemical free water. Some of the water is kept and used to water the grass on the 12 acres of grass around the plant. Boling said that

some day that cleaned water may be recycled for other purposes. Until then, staff on East Monroe Avenue will continue to clean the city's wastewater before it flows into the river current.

"We're not only preventing the spread of diseases like cholera and typhoid, we're doing it in an environmentally safe manner," Boling said.