Ames Tribune

Story City approves $244K wastewater treatment plant improvement

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STORY CITY — The City Council has awarded a $244,000 contract to Minturn Inc., of Brooklyn, to install a new wastewater equalization basin at the Story City wastewater plant.

A wastewater equalization basin helps the treatment facility have a more constant flow rate through its processes. It also helps control the concentration of the wastewater.

The project is part of Story City's Wastewater Capital Improvement Plan, which has identified approximately $2.3 million worth of improvements. Over the next couple of years, the city will need to make an investment of approximately $1.2 million in needed upgrades and improvements.

In comparison, the approximate cost to construct a new wastewater treatment plant would be $10 million.

The wastewater treatment plant, which went into operation in 1989, will require significant improvements over the next five to seven years, said City Administrator Mark Jackson.

The wastewater treatment plant is in need of improvement and upgrades, Jackson said. Some of those improvements will help the city comply with more stringent federal and state mandates, regulations and guidelines.

"The wastewater treatment plant is nearly 30 years old, and many of the items needing to be upgraded or replaced have operated beyond their life-expectancy," Jackson said. "And like all things when they age, there comes a time when certain things need to be replaced."

Story City's wastewater plant is a sequencing batch reactor treatment facility with flow equalization. It was put into full operation in March of 1989.

The wastewater enters the facility through a Parshall flume, which is located on the north side of the control building. It then enters the wet well and is lifted 20 feet by the raw wastewater pumps. This is the only stage in the process where the water needs to be pumped; the rest is all gravity flow.

The wastewater then passes through a stair-step screen that removes solid materials. These solids drop into a trough going to trash containers for collection and disposal.

The wastewater that passes through the screens then enters the grit removal system, which is a vortex unit that utilizes gravitational and centrifugal forces to remove at least 95 percent of the grit.

The liquid then flows into a sequencing batch reactor. There are two of these large, round structures at Story City's wastewater plant. The wastewater is mixed and aerated as to allow the biological digestion of the organics in the wastewater by microscopic organisms.

This mixture, which is called mixed liquor, is then allowed to settle in the equalization basins. The clear top portion is decanted off by means of floating decanters. A portion of the solids that settle out are wasted off with each batch.

This material is then pumped to the reed beds for further biological breakdown and dewatering.

Story City is one of a few municipalities in the state that uses this environmentally friendly practice at its wastewater treatment facility. By planting reed beds in 2002, the city began using the natural filtration system offered by these plantings.

The reed beds provide habitats for wildlife while they offer a sustainable choice for wastewater and sludge management.

The proper utilization and disposal of sludge is one of the most critical issues faced by wastewater treatment plants. The most important part of sludge management is to retain the nutrients in the sludge. Reed beds are an alternate

method for sludge treatment.

The reeds transfer oxygen directly from their root systems and through their stems. The root systems are met by a multitude of micro-organisms with areas of varying oxygen levels. As a result, the wastewater stored in reed beds is treated and recycled.

The decanted liquid then passes through ultraviolet lights to kill bacteria. It then flows to the stair step aeration unit, which increases the oxygen level in the water before it enters the Skunk River.