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Trout stream may affect Cedar Rapids school project

Cedar Rapids Something is fishy about Cedar Rapids school officials' looming decision about whether to fix up Kennedy or Taft schools first.

It's not that there is anything suspicious going on. It's just that talk of how runoff water from Kennedy's planned geothermal heating and cooling system would affect McCloud Run trout might hold up the project.

On Feb. 13, voters in Linn County approved a 1 percent school infrastructure local-option tax, collected since July 1. Linn school districts will start receiving the new money in mid-September.

A community oversight committee monitoring infrastructure projects in the Cedar Rapids schools met tonight.

Cedar Rapids officials plan to spend around \$80.3 million of the new sales tax for infrastructure, including \$1.7 million for Kingston Stadium improvements.

Geothermal systems are planned at Jefferson, Kennedy and Washington high schools and at Taft and Harding middle schools. The committee voted last night to avoid considering other types of heating and cooling systems.

Geothermal systems use the ground's stable temperature of roughly 55 degrees to cool buildings in the summer and heat them in the winter.

Kennedy High School is the largest of three buildings -- also Taft and Harding middle schools -- in the worst condition, said Dave Dvorak, district buildings and grounds manager.

However, the project might be delayed while issues surrounding Kennedy and McCloud Run, the state's only urban trout stream, are cleared up.

The planned geothermal system is "open." Runoff water used to cool and heat Kennedy will end up in the McCloud Run -- the state's only urban trout stream. Trout need a constant temperature, and the contractor will mix the warm runoff from two large school parking lots with water from the geothermal system to try to even out the temperature.

"Trout don't like changes in temperature," said George Kanz of Shive-Hattery of Cedar Rapids. When the system's water discharges in the stream, it will actually help keep a constant temperature, he said. It could counteract temperature changes from parking lot water runoff during rain, he added.

Linn County Public Health and the Iowa Department of Natural Resources are evaluating the site, Kanz said.

If Kennedy work is stalled, the district will start with Taft.

If Kennedy begins first, Kingston and Taft would be close on its heels, followed by Harding, and Jefferson and Washington high schools.

Steve Graham, the district's executive director of business services, now expects the local option sales tax to bring in \$143.7 million to the school district over 10 years. The project expenditures are expected to be \$140.9 million.

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Environment may force change in geothermal energy systems

CEDAR RAPIDS — A cheaper, easier and increasingly popular way to harness the Earth's energy to heat and cool buildings is drawing attention from Linn County conservation officials who think some geothermal systems are wasteful and can damage the environment.

Open-loop geothermal systems — unlike the closed-loop systems more common in homes and small buildings — pump groundwater from an aquifer, cycle it through a building to heat or cool it, then dump the water into creeks or storm sewers.

Several schools in Linn County have open-loop systems, have decided to build them or are considering them.

"We are still concerned that perhaps this is not the environmentally responsible way to go," said Laura Krouse, chairwoman of the Linn Soil and Water Conservation District Commission, who also is a Cornell College biology professor and a farmer.

Schools are choosing open-loop, or "pump-and-dump," systems because they don't require the extensive network of underground pipes needed for a closed-loop system — where water and other fluids circulate and gather heat from the ground before returning to the building.

The bigger the building, the larger the network of pipes required. That means more cost for schools.

Open-loop pump-and-dump systems simply require a well that draws water from an underground aquifer and a way to get rid of the water after it's used.

Cedar Rapids Kennedy High School is breaking ground on such a system this spring, and similar plans are in place at Taft and Harding middle schools and Jefferson and Washington high schools in Cedar Rapids. The systems are less expensive to use than traditional ones, adding to their appeal.

"Those are all, at this point, proposed to be open-loop," said Bob Gertsen, project supervisor for the Cedar Rapids school district, which already has pump-and-dump systems at Wilson, McKinley and Franklin schools.

Gertsen said open-loop systems cost roughly one-third as much up front as closed-loop systems. Kennedy's will cost about \$650,000 to install, compared with \$1.6 million for a closed-loop system, according to Shive-Hattery, the Cedar Rapids architectural firm that designed the project.

Also, a closed-loop system would require a school like Kennedy to shut down most outdoor facilities — including its athletic fields — for two years while workers dig holes and bury pipes underground.

"That's just not something that we would really be able to do," Gertsen said.

Four elementary schools in the Linn-Mar district, starting with Novak Elementary this summer, are slated for geothermal, and open-loop is an attractive option, said Linn-Mar Business Administrator Dave Nicholson.

The Silurian and Devonian aquifers, which are connected and follow the Cedar River Valley, are very productive aquifers under Waterloo and Cedar Rapids. In Johnson County, where the aquifers are less productive, there are few, if any, open-loop geothermal systems, officials say.

Commissioners and officials in the Linn Conservation District want school districts and the public to slow down and take a more precautionary approach to open-loop systems.

They have two concerns: the amount of water coming out of the aquifers, and what that water will do to the Earth's surface.

During cold winter months, just at Kennedy, about 720,000 gallons of groundwater will be pulled from the aquifer each day.

Most of it will end up in McCloud Run, an urban trout stream, and flow into the Cedar River on its way to the Gulf of Mexico, said Commissioner Robert Broulik, a farmer from Lisbon who objects on principle to using water that way "when you don't have to."

In Black Hawk County, more than 50 wells at the University of Northern Iowa and hospitals, schools and businesses pump somewhere between 5 billion and 10 billion gallons of water from the aquifers each year and dump it into creeks and storm systems, said Brett Meyers, a health officer at the county's Department of Public Health.

The aquifers probably can handle all this pumping, but no one can say for sure, said Mike Gannon, a geologist and groundwater specialist at the Iowa Geological Survey Bureau in Iowa City.

The Geological Survey last month launched a long-term study of the state's underground water supply, beginning in northwest Iowa. Its staffers are developing a computer model to predict how withdrawals affect aquifers.

"The problem is, if you lower it too much, the shallower wells have the potential of going dry," Gannon said. "Short term, I'm not too worried about it. But if you get enough of these in, you've got to think about 10 years down the road."

Gannon said it's written into pump-and-dump well permits that the Department of Natural Resources can at any time begin to require that water be piped back to the aquifer.

"They put it in as a potential requirement," he said. "If we reach a level of concern, basically every permit that comes in, we're going to require reinjection."

But drilling a reinjection well could cost as much as \$100,000 at each school, said the Cedar Rapids district's Gertsen, and power to run the pump also would add costs.

What all the water, after its use, will do to streams on the surface is another issue.

McCloud Run will be the direct recipient of the water that flows through the geothermal system at Kennedy. More than \$700,000 in grant money has been poured into the stream to improve its quality and even out its temperature over the past four years.

Krouse, of the Linn conservation board, thinks the water coming from the Kennedy geothermal system will change McCloud Run to some extent, given that it's deoxygenated, warmer than the stream and possibly high in metal content.

"Let's say the temperature is only one degree different," she said. "That might matter ... Any time it's not the ambient water, it's going to degrade the ecosystem."

Also, she said, if schools have to add reinjection wells, or cities have to add storm sewer capacity to handle geothermal dumps, all those items cost money and represent potential hidden costs to the taxpayer.

And while she and other conservation commissioners acknowledge that geothermal systems are easier on the environment than conventional heating and cooling systems are, they would like to hold an educational event to discuss the issue.

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Cedar Rapids district putting brakes on 'pump-and-dump' geothermal systems

CEDAR RAPIDS Superintendent Dave Markward will recommend next month that the school district build no more "pump-and-dump" geothermal heating-cooling systems in its schools.

The future impact of such systems on groundwater supplies was the deciding factor, Markward said.

"When the DNR (Department of Natural Resources) says we're not certain of what this is going to do long-term, that took me off the spot where I was and put me in a new place," he told The Gazette on Wednesday.

Markward will deliver his recommendation at a June meeting of the committee that oversees the sales tax income for infrastructure projects in the Cedar Rapids school district.

He says he will tell the committee that any new geothermal projects — including the one at Kennedy High School — should either be closed loop or include reinjection wells that will return water to the aquifer.

The existing open loop geothermal systems at three Cedar Rapids schools are "still open for discussion," Markward said.

"I'm an old science teacher, and certainly, like everyone else, concerned about the environment," he said.

Just months ago, at least six schools in Cedar Rapids and Marion were slated for open loop "pump-and-dump" geothermal systems, where the system pulls hundreds of thousands of gallons of water at ground temperature from aquifers, cycles it through a building to heat or cool it, then dumps it into a stream or storm sewer.

The systems became popular at area schools because they're cheaper and easier to build than the closed loop systems more common to homes.

But conservation officials warned open-loop systems can be wasteful and damaging to the environment. If each school that planned open loop geothermal systems proceeded with the systems, the annual amount of water pulled from the aquifer under the metro area would have increased dramatically.

The School Infrastructure Local Option (SILO) committee overseeing construction and the installation of new heating-cooling systems held an informational meeting last month where DNR officials and architects explained the pros and cons of open-loop systems.

After that meeting, the SILO committee recommended the district set aside \$1.6 million to pay for reinjection wells at each of the five Cedar Rapids schools slated for geothermal. The recommendation goes to the school board for action.

The city of Marion has imposed a moratorium on open loop systems to give the City Council there time to create regulations and a fee schedule for discharging water from open-loop systems proposed for schools in that city.
