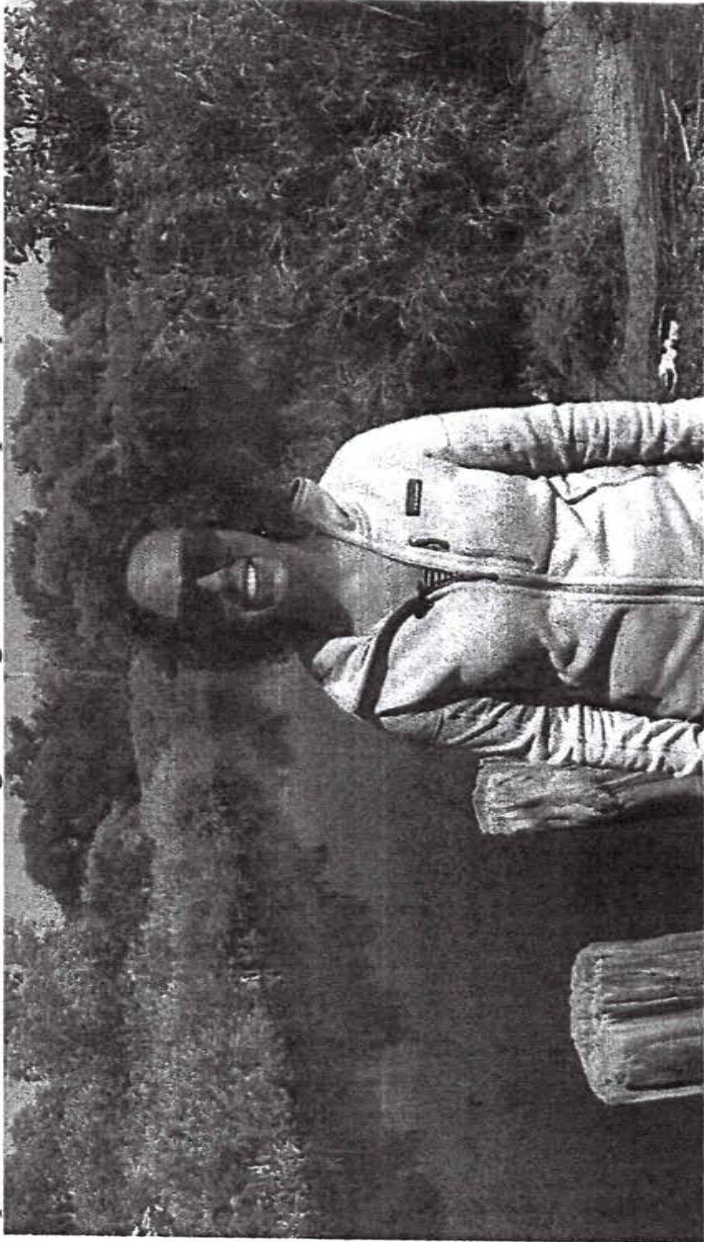


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Murray has made South Dakota water officials and wastewater treatment operators aware of her findings through a series of public presentations.



Kelsey Murray, who recently did research on dangerous E.coli bacteria in South Dakota rivers, stands along a quiet section of Rapid Creek just east of downtown Rapid City. Photo: Bart Pfankuch

Years after mining, arsenic still flowing

Toxic arsenic is still leaching from remnants of gold mining that ended two decades ago in Lead and Deadwood, and now researchers have tracked the carcinogenic compound hundreds of miles downstream from the source.

A years-long Mines study published this spring showed that tailings from gold mining in Lead-Deadwood throughout the 20th century are still sending arsenic, mercury and other contaminants hundreds of miles through Whitewood Creek, into the Belle Fourche and Cheyenne rivers and eventually to the Missouri River. The study by researchers from the School of Mines and U.S. Geological Survey also indicated that cleaning up the arsenic and other chemicals would be difficult due to the extent and length of the contamination. Remediation could also be dangerous because trying to remove any contaminated sediment could “resuspend” or increase the release of toxic materials into the waterways.

A 1988 study by the U.S. Geological Survey first confirmed the presence of high levels of arsenic in Whitewood Creek and the Belle Fourche River. The

latest study showed that the contamination is present hundreds of miles further down the river valley that leads to Lake Oahe and the Missouri River.

The arsenic is from gold mining operations in Lead-Deadwood area that from roughly 1875 to 1977 polluted the rivers with an estimated 100 million tons of contaminated mine tailings, or rocks used in mining that were crushed to the size of sand or smaller. After the Clean Water Act was passed in 1972, operators of the Homestake Mine built an impoundment in 1977 to store the tailings in Grizzly Gulch to keep them out of Whitewood Creek.

Both the new study and the USGS research in 1988 found huge concentrations of arsenic in the "pore water," the water that is found in rocks, and in the sediment. The Mines research found pore water samples with arsenic levels at 257 times the amount that would occur naturally in that region, and at 30 times the level that would occur naturally in the sediment.

The Mines study noted that much of the land along the contaminated river routes is sparsely populated. However, the contaminated Cheyenne River runs along the southern border of the Cheyenne River Indian Reservation where it is a resource for fishing and swimming and in previous years was the source of drinking water for the roughly 8,500 tribal residents.

David Nelson, environmental director for the Cheyenne River Sioux Tribe, said the historic damage done to the Cheyenne River system is likely irreversible.

"It's there, we're concerned about it, but we don't have the billions of dollars it would take to clean it up, nor does the state of South Dakota," Nelson said. "You would be talking one of the world's largest dredging projects because that's the only way you could get rid of it."

Nelson said his tribe is also worried that more pollution could be thrust upon them if any existing or proposed oil or natural gas pipelines rupture and foul area waterways. He said the connection between all the varied forms of pollution on the Cheyenne River is a quest for money.

"We have to ask ourselves, 'What's most important, clean water or revenue coming in from a potentially contaminate source?'" he said.

"With the mining operations, we know it's going to give off pollution, but look how much money we made mining gold and how many people we employed."

A separate study in 2014 found that residents of the Cheyenne River Sioux Tribe who ate fish from the river had high levels of toxic mercury in their bodies, which can reduce the ability of their immune systems to fight off illness and disease.

Mining operations in western South Dakota have led to other forms of pollution and concerns about the impact on human health.

In 2016, Mines researchers found that historic uranium mining in southwestern South Dakota led to detectable levels of uranium in the popular Angostura Reservoir near Hot Springs and in the Cheyenne River that cuts through much of Indian Country.

Nelson said tribal members are well aware of the contamination in their namesake river, but that there is a sense of powerlessness to do anything substantive to remedy the situation.

“We’ve advised people because of problems in the river system, just be cautious,” he said.