Scientist says new, cheaper biological method will help clean Leviathan Mine

Nevada Appeal, 4-17-2002
Geoff Dornan <mailto:nvappeal@govmail.state.nv.us>
A team of University of Nevada, Reno scientists has developed a new system of neutralizing poisonous discharges from Leviathan Mine they say is much cheaper and more effective than traditional methods.

Chemist Glenn C. Miller said Tuesday the system relies on a chain of chemical reactions to reduce the acidity of toxic waste spilling out of the mine site a half-dozen miles inside California.

That toxic waste has been the source of major pollution spills into the Carson River for years. The Washoe Tribe of California and Nevada finally got the federal government to force parties into fixing the spills several years ago.

Miller outlined a complex series of chemical interactions he says allows conversion of the sulfuric acid leaching metals out of the ground at Leviathan into hydrogen sulfide -- rotten-egg gas.

Once the acidity of the water is reduced, the dangerous heavy metals in the waste water precipitate out, leaving much cleaner water.

"We're not producing drinking water," he said. "It smells terrible and it's not good water, but fish can live in that water."

He said the system has been tested at the mine site for several years now as he, fellow scientist Tim Tsukamoto and others worked out the kinks in the system.

The toxic yellow runoff from the mine is mixed in a tank with a form of alcohol and organic materials such as manure. After a few days, the result is smelly black water with much less acid in it and almost none of the aluminum, copper, arsenic, nickel and other dangerous metals leached out of the ground.

What's more, he said, he believes the acidic sludge that's left could be safely added to normal soil in other parts of Nevada to reduce the amount of alkali and balance its pH level for crops.

He said the dead zone of Leviathan Creek is shrinking, indicating that the water is much less toxic than in the past.

"It's actually working pretty spectacularly," he said.

Best of all, he said, the system will cost far less than the traditional method of adding huge quantities of lime to the runoff to cut its acidity. That, he said, would cost ARCO upwards of $500,000 a year. The bio-reactors, he said, could cost less than $75,000 a year and require much less intensive monitoring.

He said Tsukamoto was talking to officials at ARCO, which owns the mine site, and California, Tuesday about the project to construct the system.

"It is going to be constructed this spring," he said.

Leviathan began as a copper mine in the 1860s. Later, it became a sulfur mine but it hasn't been active for 45 years. For years, the ponds at the site would overflow, sending a huge plume of toxic, yellow water downstream into the Carson River.

Miller said work at the site has prevented those spills for the past three years. He said the new system for neutralizing the toxicity of the water could go a long way toward fixing the problem.

Jason Geddes, Ph.D.
Senior Petroleum Chemist
Nevada Department of Agriculture
Measurement Standards-Petroleum Technology
(775) 688-1182 ext. 249; fax(775)688-1178
jgeddes@govmail.state.nv.us