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Acid rock drainage a concern; Mine plan proceeds

PHOTO: Whitewater and Associates field scientist Dave Tiller takes flow measurements of the water leaving the Iron River treatment site. Constant monitoring and treatment has kept pollution known as "yellow boy" out of the river. (Whitewater & Associates photo)

By PETE MACKIN, Journal Staff Writer

MARQUETTE - A preliminary design has been completed for the proposed Project Eagle Mine near Big Bay, according to manager Jon Cherry.

"We've completed a preliminary design and we are currently matching that up with environmental baseline conditions at the site to determine potential environmental impacts," Cherry said Wednesday. "From that we can adjust the design to mitigate those impacts. We won't be ready to apply for a mining permit until all of those steps are completed."

Kennecott Minerals has proposed to dig the only underground primary nickel mine in the United States in the Yellow Dog Plains near Big Bay and the Salmon Trout River headwaters. Researchers have been testing core samples taken from sites surrounding the ore body. Those tests, combined with baseline environmental condition reports, will be the basis for the permit application.

"Kennecott has taken samples of the rock and has been running water over it to simulate months and years of exposure," DEQ mineralogy expert Steve Wilson said. "By analyzing that water, they have a much better idea of how to design the treatment."

At the close of 2004, the state Legislature approved new precious metal mining rules which will govern any future non-ferrous (metals other than iron) mines. Kennecott may be the first company - perhaps by the end of this year - to test those rules if it files a permit for Project Eagle.

Wilson said the state will review data pertaining to the identification of the ore body, the design of the operation, plans for containing rock and the purification of water and air at the site.

"The permitting process makes the application available for review by many experts with a wide array of technical understanding," Wilson said. "This will not just be reviewed by our office."

One major concern raised by mine opponents is a natural process known as acid rock drainage. Many also refer to ARD as acid mine drainage, but the process does exist in nature and not just in mines. Those who use the AMD term said they do so because, while most surface sulfides have already rusted out, disturbing the surface exposes new materials and the process starts back up again.

"You need three things to create acid rock drainage," Wilson said, "a sulfide mineral, water and air in the right combination."

Doug Cornett of Northwoods Wilderness Recovery states in the NWR newsletter that potential mining and the widespread exploration of minerals, "pose a clear threat to the environment, economy, and community of the U.P."

"Acid mine drainage has the potential to pollute water bodies and ground water with acid and heavy metals," Cornett said. "Most mines deal with AMD by placing tailings and contaminated water into lined holding pits. Unfortunately, this technology fails to prevent pollution, and will negatively impact rare and endangered aquatic species, including the Salmon Trout River populations of coaster brook trout."

The acid-producing process has been enhanced or accelerated by past mining practices, leading to riparian pollution in several states, including the Upper Peninsula. This is the core of concern for many regarding hard rock mining in a sulfide ore body.

The sulfides which formed in Iron River were likely created by sulfur reducing bacteria and



are highly reactive because of their fine grain structure. Scientists believe the sulfides near Big Bay were volcanically produced at high temperatures and pressures, making their compact structure much less reactive.

According to ARD expert Al Johnson, sulfide compounds range widely in their reactivity, from milder, compact chalcopyrite to highly reactive porous forms of iron pyrite.

"A salt block will dissolve slowly, but if it was ground into powder, it would dissolve quickly," said Al Johnson. "That's a good example of the difference between the sulfides in Iron River and those near Big Bay."

Cherry often has defended potential mining near the Salmon Trout River by referring to core samples showing the less reactive sulfides. But Cherry said that will be a moot point in the mine design.

"What we're working on, with the design, is (containing) any rock that comes out of the ground," Cherry said. "Any water that comes in contact with that rock will be contained and treated to better-than-drinking-water standards."

Iron County officials have seen the good, the bad and the ugly of the mining industry. While some companies went bankrupt and disappeared, leaving a mess, other companies are still working with the county on repairing messes left decades before by now-defunct operations.

As for the future, the closest potential mine site with official exploration is north of Iron County near Kenton, in Houghton County. However, Iron County Mine Inspector Tom Karvala said there has been some interest in a kimberlite formation near Crystal Falls.

Karvala has faith in new state mining regulations that are designed to oversee operations.

"The old mining companies' plan was to get ore and get out," Karvala said. "But the mining industry has changed dramatically since then, for the good."

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