

Monday Musings: Meet 'Indiana Jones' of the Parrot

By Roberta Stauffer, Standard opinion editor | Posted: Monday, April 5, 2010 12:00 am



Hydrogeologist Nicholas Tucci is on a mission. His worthy goal is to track what lies beneath the very heart of Butte.

So far, he's made some pretty interesting discoveries, which we'll get to soon. But first, several flashbacks:

It's 1881 and the Parrot smelter just started operating along the banks of Silver Bow Creek, east of the present-day Civic Center.

By 1899, the operation has closed, but the waste remains.

Fast forward to 1957, when truckload after truckload of overburden from the Berkeley Pit is piled on the tailings and the slag. The Parrot ballfield tops off some. In the 1980s the county shops go in nearby. And below the surface lies groundwater, bright blue in

some spots from the dissolved copper.

Summer 2009: Not content with these vague outlines, the intrepid Tucci sets off to fill in some blanks. His tools? A drill rig, a laboratory, a graduate degree in geochemistry from Montana Tech, funding from the Natural Resource Damages Program, and 20 years worth of previous investigations from which to learn. Into the lab he goes, armed with cores from 20 drill holes placed strategically around the site, 30 feet deep on average. Out he comes with significant information, either new or confirming prior data:

* The bull's eye of contamination lies in the center of the ballfield, but the tailings aren't the worst of the worst. The clay-like soil underneath holds roughly 10 times more copper, after a century of in-place leaching. Any future waste removal would logically include both tailings (0.08 percent copper) and the organic clay below (1 percent copper). Volume-wise, in the most polluted area, this would amount to nearly 205,000 cubic yards of tailings and 116,000 cubic yards of clay.

* Fortunately, the overburden and slag on top are not that contaminated. They could probably be set off to the side during a removal and then put right back, cutting costs considerably since there's more of the relatively benign stuff: 377,000 cubic yards of slag and 373,000 of fill. When consultants for the EPA drew up cost estimates a while back, they assumed everything would need to be hauled to a special waste repository.

*n The groundwater in the bull's eye is the most contaminated on the Butte Hill, with 20 times more copper than the Berkeley Pit water Montana Resources is "mining." And it's not static. Exactly how fast and how far the groundwater plume has traveled over the decades remains a mystery, but it's definitely a "dynamic area," Tucci said.

And he's itching to learn more.

For starters, there's a gravel layer underneath the clay that he'd sure like to "chase." Maybe dig some wells into it southwest of the bull's eye, drilling down as much as 55 feet this time, tracking the groundwater under there and learning what it's made of.

Then there are blocks of data to pore over. For decades, Tucci's employer, the Montana Bureau of Mines and Geology, has kept close tabs on groundwater quality and movement to the north, east and south of the Parrot for the Berkeley Pit Mine Flooding Superfund site. Several years ago, groundwater monitoring started for the Butte Priority Soils Superfund site, beginning at the Parrot and continuing generally west along the Metro Storm Drain.

Combining these two databases and looking at trends is a crucial component to understanding the system as a whole. "The big picture is important," Tucci said. "Looking at long-term trends helps you see the forest through the trees."

Analyzing results from the recent pump test the Atlantic Richfield Co. completed around the Parrot is also high on the NRD's Tucci to-do list. They'll reveal much about the quantity of water under there and how well the underground French drain system is capturing it.

For a hard-scrabble hydrogeologist, this work is as good as it gets. Tucci, 31, moved to Butte from his native Youngstown, Ohio, because he wanted to work on Berkeley Pit remediation, and now he's equally gratified to be part of the team taking on the puzzle of the Parrot.

"It's a hot topic to be part of," he said. "It's exciting when other people are so interested in what you're working on."

Big decisions loom, and Tucci's determined to keep seeking the facts to help drive them through his role of providing technical assistance to the NRD program.

Following Tucci's presentation of findings to the Butte Restoration Alliance, NRD environmental specialist Greg Mullen praised the research and said it "really did fill a lot of holes."

But resting on laurels will have to wait. For Tucci, it's onward and downward, in dogged pursuit of the plume.

"Everyone involved wants to make sure that the (Superfund) remedy is capturing the groundwater," he said. "It's a goal shared by many."

To him, I say: Carry on, Indiana Jones of the Parrot. True, you don't have a bullwhip. And no one is trying to kill you. But your mission is critical, none other than probing the headwaters of the mighty Columbia.

Just be sure to watch out for the snakes.

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