

Subject: Fwd: FW: [Campus Community] FW: CEE Graduate Seminar Series: Wednesday, April 16th 4:00 pm
CB 204W

This is TODAY. You received notice of this a few days ago, but here is the announcement with Dr. Rahn's research Abstract.

Wednesday, April 16, 2014 * 4:00 p.m. * CB 204W
Dr. Perry H. Rahn, P.E.

Professor Emeritus, SDSM&T Department of Geology & Geological Engineering

“Permeability of the Inyan Kara Group in the Black Hills Area”

ABSTRACT: Fluvial sandstone channels in the Cretaceous Inyan Kara Group in western South Dakota have variable thickness and texture, causing variability of the hydraulic conductivity. Pumping tests in two 120-ft thick sandstones at a proposed in-situ leach uranium mine in the Dewey/Burdock area provide hydraulic conductivity data. The hydraulic conductivity in the upper sandstone (Fall River Formation) is 0.45 ft/day and the lower sandstone (Chilson Member of the Lakota Formation) is 1.56 ft/day. These data, along with the prevailing gradient of the potentiometric surface, can be used with conventional Darcy Law equations to estimate the groundwater velocity. The average groundwater velocity for these two sandstones in the Inyan Kara Group is approximately 66 ft/year.

Real groundwater velocity data for this aquifer seem to invalidate this Darcy Law prediction. Based on tritium data, Gott et al. (1974) determined the groundwater velocity in the Inyan Kara Group in the Dewey/Burdock area is 5,480 ft/year. This value seems very high, but may indicate fast groundwater movement through very permeable units or through fractures.

An important environmental consideration following the abandonment of this proposed uranium mine is that the groundwater will migrate down gradient and may contain a high concentration of dissolved uranium (with daughter products radium and radon) and selenium. The rate of movement of these elements would be less than the groundwater velocity because of retardation associated with geochemical reactions related to changes of pH and

Writers too close to Powertech uranium proposal

Natural gas is the new major focus for energy and has negatively affected the nuclear industry, resulting in decreased demand for uranium. Germany is nearly nuclear-free and other countries are closing down reactors.

The USA's reactors are in ill-repair and very susceptible to weather events, earthquakes and terrorism. Our method of storage for spent fuel is outdated, making our reactors very vulnerable. Europe uses a "HOSS" (hardened on-site storage) system, greatly reducing risks.

The USA is closing reactors and has sufficient uranium available. France is perfecting a system of re-using uranium, which will further decrease demand.

Confusing the public are

The author

Rebecca R. Leas, Ph.D., is a health education specialist in Rapid City

Powertech employees, shareholders and supporters writing letters to the editor but not identifying their relationship. This is important for the public to know.

Rep. Mike Verchio stated cancer wasn't a problem in Fall River County but cited no source. He failed to mention that he helped write and pass SB 158, stripping our state protection (along with legislators Lance Russell, Bruce Rampelberg, Brian Gosch and David Lust).

Randy Brich's letter failed to mention his beneficial

Powertech relationship and his wife's being a Powertech lobbyist in Pierre. He claims the Crawford, Neb., mine has no problems, but government documents demonstrate otherwise.

Cindy Turner wrote a Forum article bemoaning Rapid City Council's resolution, comparing the proceedings to the Salem Witch Trials and calling Dakota Rural Action an "environmental extremist group" and then threw in pine beetles!

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Rep. Mark Kirkeby called Rapid City Mayor Kooiker a liar. It certainly would be helpful

if the public were to be apprised of these people's relationships to Powertech.

In a Journal Forum article, Powertech CEO Richard Clement belittled a Rapid City church for opposing the mine and stated "ISL mining is intrinsically safe," contrary to EPA admittance that in situ leach technology is way ahead of health and safety knowledge. Clement's claims are unethical and without scientific support. In fact, because the damage done underground is "hidden" and we can't observe it nor perfectly predict what occurs, the likelihood of greater long-term damage occurring is significant.

Powertech's project manager Mark Hollenbeck wrote an article, accusing opponents of fear mongering. Interestingly, if one

reads the NRC, EPA, USGS literature and scientific studies from premiere geology programs, one concludes this is bad business. Hollenbeck's statements are conjecture, not fact.

Citizens should read scientific documents themselves and not rely on what a company "claims" it will do; that is called a "sales pitch," not fact.

Citizens opposing uranium mining have been reading scientific documents and their letters to the editor have repeatedly referred to government documents and scientific sources. Peer reviewed science, not "sales pitches," is what our state leaders should be using to guide South Dakota's future.

Beware: water will be the delimiting factor for future economic growth and sustainability.

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Uranium

• Former South Dakota Gov. Mike Rounds, now a U.S. Senate candidate, and former state Sen. Elizabeth Kraus, have family members employed by Powertech Uranium Corp.

• Powertech does not say whether it will pump its waste water into one of two aquifers or spray it across the ground.

• In pre-hearings, the state Board of Minerals and Environment denied attempts to postpone the hearings to get more information, and denied a request by the Rapid City Council to have its resolution expressing grave concern about the mining project into the formal record. The panel also restricted public testimony to just two hours of its four-day hearing.

For Rapid City Mayor Sam Kooiker, those last two points call into question whether the state minerals board will give a fair hearing to mine critics.

"The board comes out to Rapid City, they hold their hearing in Rapid City, then silence the voices of Rapid City," Kooiker said.

"They appear to want to hear only one side," he added, "and it appears that a decision has already been made."

Easing the rules

The story of the proposed Dewey-Burdock project begins in 2005. But story of uranium in Southwestern South Dakota really starts in the 1950s.

Uranium, a rare earth metal, is radioactive in low levels in its natural state but when concentrated can be turned into fuel for nuclear reactors and weapons. Nuclear energy is considered by many standards as the cleanest way to generate electricity. But actual mining for uranium in South Dakota's past was messy. Abandoned open pit mines left vast raters and an extensive clean-up of Edgemont's old uranium mill.

The industry has advanced since then, replacing open pit mining with a process called in-situ mining - Latin for "in place" - that injects oxygenated water underground. That water absorbs the uranium under the surface and is pumped back above ground, where the uranium is extracted and processed.

It is a cleaner method than the open-pit mines of half a century ago, and Powertech representatives say that the mine will do no damage to the aquifers - namely the Madison and the Minnelusa - that the region depends on for drinking water. And even if it did, they say, any contaminated water near the project area would flow largely away from Rapid City and other population centers.

Nevertheless, as it became apparent that uranium mining would return to South Dakota, state officials began a pattern of weakening, and later suspending, state mining regulations. The first changes came in 2008, when the state board of minerals eased two sets of regulations that the state had developed the year before to prepare for uranium mining.

"What the people on the board told me was that since the Legislature authorized permits, we felt we had to change our regulations so that we could make mining possible," said Bruce Ellison, an attorney for Clean Water Alliance, an umbrella organization or groups opposing the Dewey-Burdock project.

Flipping through a binder one day of the original and amended laws, Ellison pointed to this example of the changes he says weakened the state's authority.

Before: "Restoration [of groundwater used in mining] shall demonstrate actual production and restoration conditions ... of the secretary determines that

secretary shall recommend that the permit be not issued."

After: "If the ground water restoration ... indicates that the operation will be unable to achieve the standard of returning affected groundwater to baseline conditions with the application of best practical technology, the secretary may set the restoration values."

The change reduced the company's responsibility to prove it could restore contaminated water to its original condition. Instead, the company would only have to demonstrate it tried to clean up the water to the best of its ability, not that it actually had restored it, according to Ellison. Also, it could now ask for a relaxed standard.

"What we used to have in place were regulations that absolutely protect our aquifers," he said.

Because it is involved in the state's two contested permit hearings over the Powertech project, the DENR was unable to comment on most matters for this story, according to Kim Smith, a spokesman for the DENR.

Suspending the law

Even under those diminished rules, DENR officials twice called into question aspects of Powertech's project application. Then came Senate Bill 158.

The 2011 bill, written by Powertech lobbyist Larry Mann, removed the DENR's authority to regulate the state's already weakened laws on in situ mining and injection wells.

Mann and Powertech spokesman Mark Hollenbeck described the measure in senate hearings, and since, as a way to remove needless duplication of regulations already covered by federal agencies.

But a former DENR employee who had worked on the state's in situ mining regulations thought passing the bill would be a mistake. Gary Haag wrote a letter to the House State Affairs committee chairman - which was read aloud by a Sierra Club lobbyist at a 2011 committee hearing - explaining why.

"The DENR would do a better job of inspecting and enforcing the regulations at these facilities," wrote Haag. "State regulators can respond more quickly to issues that may arise at these facilities. They are local and can hit the ground running."

Both House and Senate members voted overwhelmingly to suspend DENR enforcement oversight for the project. Gov. Dennis Daugaard signed the bill later that year, essentially removing South Dakota from enforcing state regulations.

House Minority Leader Rep. Bernie Hunhoff, who voted against the bill, said he had the impression that DENR did not want to be removed but was cut out anyway.

"I had a gut feeling that they were not comfortable with this," said Hunhoff, D-Yankton.

Hunhoff described the bill as something that "dates back to our pioneer history of being desperate for development" and said he would like the legislature to authorize some sort of state regulation for the project beyond initial permitting.

"It's only a matter of copying some of the reports," Hunhoff said, referring to the argument that the regulations would duplicate what federal regulators oversee.

Ellison calls into question whether state legislators are even aware what the federal government will and won't regulate. "What they did was they abdicated their responsibilities without knowing what the feds in fact could even do," said Ellison. "It doesn't make any sense to me."

The three states with opera-

Meet the Minerals Board

Members of the state Board of Minerals and Environment are appointed by the governor. Current members are:

Richard Sweetman, Sioux Falls

Lee McCahren, Vermillion

Linda Hilde, Madison

Dennis Landguth, Rapid City

Glenn Blumhardt, Bowdle

Doyle Karpen, Jefferson

Pete Bullene, Watertown

Rex Hagg, Rapid City

Robert Morris, Belle Fourche

- all have state-level regulation and enforcement in addition to federal agencies that govern uranium mining.

Without state-level enforcement, South Dakota mining will be left completely in the hands of the Environment Protection Agency and the Nuclear Regulatory Commission, the latter of which has its own critics.

One of those is Eric Jantz, staff attorney for the New Mexico Environmental Law Center, an organization fighting a proposed in situ mine there. Jantz faults the NRC for a variety of reasons: it lacks specific laws governing in situ mining; isn't accessible to the public; doesn't require long-term monitoring of mining sites; and doesn't have strong enough penalties for violations like when mining contaminants leaves a mine's boundary area.

"I think that if protection of environmental resources and public health is the goal, then the NRC is sort of the worst path for achieving that goal," said Jantz.

Kooiker, Rapid City's mayor, became involved in the mining issue along with the council because the Madison Aquifer, which lies beneath where Powertech plans to mine, provides two-thirds of the city's water supply. But Kooiker said he was pressured by Powertech and some local legislators - who he declined to name - to keep Rapid City out of the debate.

"There was a lot of discussion, but there was certainly some opposition from Powertech and legislators to not be involved," Kooiker told the Journal.

Powerful connections

Former Sen. Elizabeth Kraus, R-Rapid City, voted in favor of Senate Bill 158. Her husband, Jim Munro, is a Powertech employee hired in 2008 as a design engineer on the project.

Mine critics like Ellison and Jarding say Kraus is an example why they believe, and many mine critics contend, that state officials must have some kind of financial interest in the proposed mine, though they can offer no proof.

House Majority Leader David Lust, R-Rapid City, says those accusations are baseless.

"I'm not aware of [a lawmaker] that has any financial stake in Powertech," said Lust, who voted for Senate Bill 158.

"No one has shown me any evidence that there is any conflict here," he said. "It seems to be kind of a naked assertion that lacks substance."

In a document filed with the state ahead of the minerals board proceedings, Powertech identified one South Dakota investor, which it did not name, who owns 5,000 shares. That totals only about .004 percent of the company.

Kraus is not the only state official with a connection to Powertech. Both the sister and brother-in-law of former Gov.

This week's permit hearings

State Board of Minerals and Environment hearing

SEPT. 23: The first day of the large-scale mine hearings start at 10:30 a.m. at the Best Western Hotel and Conference Center in Rapid City in the South and II rooms. Public testimony will occur between 11 a.m. and noon on this day.

SEPT. 24 TO 26: Cases between Powertech and opponents continue morning at 8:30 a.m. in the Western Ramkota Hotel and Conference Center.

SEPT. 27: Case between Powertech and opponents continues at 8:30 a.m. in the Rushmore Plaza Center's Alpine Room, in Rapid City.

Michele Brich, in fact, a registered lobbyist for 2011.

Rounds, whose gubernatorial term ended in January 2011, told the Journal in 2008 that he knew little about what his family members' work with the company.

And Rounds - who is currently running for United States senate - said last week that he had little involvement with Powertech's proposal.

"Our effort for this economic development effort had been the same for any other economic development effort," Rounds said last week. "We roll out the carpet, but we will not cut corners."

Rounds described the extent of his involvement in the proposed mine as consisting of two meetings, both some time in 2007. The first was with Powertech representatives who wanted to share their ideas. The other was with DENR staff to fill Rounds in on background information and make sure the state could handle any obstacles - from state resources to manpower - that the project might provide.

"I had them into a meeting in my office and said, 'there's no corner-cutting,'" according to Rounds. "They said, basically, 'we're ready, we get it.'"

Uncertainty on regulation

But state officials gave the Journal conflicting statements about what the DENR's role in regulating the mine might be.

Kim Smith, a spokesperson for the department, said the department will still be able to perform on-site inspections and regulate Powertech by way of any mining and water permits granted by the state. When asked whether DENR employees have been trained to inspect in situ mines, Smith referred the Journal to the state Attorney General's Office.

A spokesperson for the Attorney General's Office, however, contradicted the idea that the DENR would be regulating the mine.

While some DENR employees might be trained "in certain aspects" to inspect uranium mines, the question isn't relevant because federal agencies are "the ones that end up with the jurisdiction," said attorney general spokeswoman Sara Rabern.

Michael Hickey, an attorney for the Black Hills Wild Horse Sanctuary, who is formally opposing the project at this week's hearings, has written that there is no guarantee that the DENR's previous reservations over the project will be examined.

"When Powertech filed its applications before the EPA and

... asked the state to relax the standards, the regulators have relaxed the standards."

"When you hear miners talk in public forums and stuff, they will tell the public, 'we're going to be required to turn the water back to the condition it was before we began,'" he added. But, he says, it's more like: "We're going to pretend that these are the standards to begin with, but we know that there's a very good chance that the standards will be relaxed later on."

South Dakota Gov. Dennis Daugaard has not taken an official position on the proposal, according to spokesman Tony Venhuizen, "and doesn't believe that he should interfere in these contested cases."

"The governor believes that Powertech, like all corporate citizens, should comply with all state and federal laws and requirements, and that the state's role is to make sure that state laws and regulations are followed."

A question of trust

In a small meeting room last Monday at Rapid City's Best Western Ramkota Hotel, Dewey-Burdock's opponents made a first attempt to delay the state Board of Minerals and Environment hearings to get more details on the proposed mine. The attorney for the wild horse sanctuary, argued that the company's application is too vague. If the state waited for the NRC and EPA to decide on the project, he argued, state board members - and the public - would have more details about the proposed mine.

Details like whether the company will pump its waste water deep down into the Deadwood or Minnelusa aquifers, or spray it across the ground at surface level, or whether it will begin mining in the Dewey area or the Burdock area; how many wells it will drill and which direction the drill site will move as time goes by.

But Rex Hagg, representing the state Board of Minerals and Environment, denied the motion to delay the hearings.

During the debate, Hagg reminded Hickey that his board can attach conditions to the project's permit to help make sure it is safely run.

"Are you not comfortable that those are safeguards?" Hagg asked Hickey.

"No," said Hickey. "I'm not."

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