Company Considers Chemical Uranium Extraction

JAMES MacPHERSON Associated Press Writer — September 23, 2009
BISMARCK, N.D. (AP) — An Australian company exploring for uranium in southwestern North Dakota believes it may be able to save millions of dollars by pouring chemicals over piles of lignite to extract the radioactive element and other valuable substances.

Formation Resources Inc. of Bismarck, a unit of PacMag Metals Ltd., based in West Perth, Australia, was granted a state permit last year to drill test holes for uranium in parts of Billings and Slope counties. The company said it also found molybdenum, a substance used to harden steel, and germanium, a scarce and valuable element used in making semiconductors, transistors and infrared equipment.

PacMag Metals has leased about 25,000 acres of private land in North Dakota in search of uranium. It refers to the uranium-germamium-molybdenum drilling as the Sentinel Project. The company has said it would use an open-pit mine and build a processing plant in the area.

Jim Guilinger, a PacMag consultant and president of Arvada, Colo.-based World Industrial Minerals, said Tuesday that the company is considering a heap-leaching process, which involves putting chemicals over lined piles of lignite and collecting the elements after extraction.

Though common in gold mining, the process is no longer used in the U.S. to extract uranium, and never has been attempted in North Dakota, state and industry officials said.

The chemicals involved in heap leaching uranium would be various acids, not the cyandide used in gold extraction, the company said.

A traditional facility would dry and heat ore inside a building, then leach uranium in chemical vats at a cost of nearly $100 million to process about 250,000 tons, Guilinger said. Heap leaching would lower the cost to less than $20 million, he said.

"We're trying to come up with the best economic process at this point," Guilinger said. "We're moving forward, definitely."

PacMag is the only company to apply for drilling permits for uranium in North Dakota, said Ed Murphy, the state geologist.

State and federal agencies would be involved in the permit process, which could take years, he said.

"This would be looked at very carefully, to see what the potential environmental

impacts would be," Murphy said. "We would ensure proper environmental safeguards would be in place and this would be monitored very carefully."

The high-grade uranium found in southwest North Dakota is at a shallow depth, usually less than 60 feet, according to PacMag.

Guilinger said the heap-leach process to extract uranium is used worldwide but has not been used in the U.S. in years because most "near surface" uranium already has been mined.

"Most of that's gone now," Guilinger said. "Other than (North Dakota), there isn't high-grade, near-surface (uranium) available for processing. It's been picked pretty clean."

Most uranium mining in the U.S. uses a process called in-situ mining that uses chemicals and water to leach out uranium and pump it to the surface. Guilinger said that process is impossible to use with many North Dakota deposits because of the shallow depths.

Uranium previously had been mined from at least nine sites in southwestern North Dakota, Murphy said. The state's mines produced about 592,000 pounds of uranium oxide while they were in operation between 1962 and 1967, he said.

Mining companies burned lignite, often called brown coal, to reach the uranium within it, Murphy said. Companies used old tires or diesel fuel to ignite the open pits, then shipped uranium-laden ash to other states to be processed further, he said.

Uranium mining nationwide predated federal regulations. North Dakota adopted regulations in 1968, a year after uranium mining stopped in the state, Murphy said.

Pushed by worldwide demand for nuclear power, uranium prices increased from about $7 a pound in 2002 to about $135 in 2007. The price now is about $50 a pound.

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