Acquisition could lead to increase in state's oil output using CO2

BY JOHN S. ADAMS TRIBUNE CAPITOL BUREAU • MARCH 9, 2010

HELENA — One of the nation's top independent oil companies is on the verge of becoming Montana's largest oil producer.

Shareholders for Plano, Texas-based Denbury Resources will vote today on the company's purchase of Encore Acquisition, currently the state's largest oil producer with assets in the Williston, Big Horn and Powder River basins of Montana and North Dakota.

Shareholders are expected to approve the $4.5 billion deal, paving the way for increased enhanced oil recovery using carbon dioxide in the Bell Creek and Cedar Creek Anticline oil fields in eastern Montana.

Executives for both companies met with Gov. Brian Schweitzer late last week to lay out their plans. Denbury officials told Schweitzer that they plan to carry on with Encore's proposal to build a 226-mile pipeline to transport excess carbon dioxide from ConocoPhillips' Lost Cabin natural gas plant in central Wyoming to the Bell Creek oil field near the Montana-Wyoming border.

That would bring a carbon dioxide pipeline to within 120 miles of the Cedar Creek Anticline, where Encore estimates 200 million barrels of oil could be recovered using enhanced oil recovery.

Reviving old wells

Denbury's president and chief operating officer, Tracy Evans, said the company estimates it can recover some 230 million barrels of oil from the Bell Creek and Cedar Creek Anticline fields.

"If all of our plans are successful, it'll mean significantly more oil production," Evans said in an interview after the meeting at the governor's office. "It'll be more jobs. It's much more manpower-intensive to do CO2-enhanced oil recovery than it is to do primary and secondary operations."

Denbury has become one of the nation's top independent oil companies by specializing in enhanced oil recovery. The process involves injecting massive amounts of carbon dioxide deep into the ground to coax more oil out of old wells that were depleted using traditional drilling and extraction methods.

Denbury, which has so far focused most of its attention on oil fields in the Gulf Coast region, is in the process of building a 320-mile-long carbon dioxide pipeline from Louisiana to a decades-old oil field south of Houston. That project is one of largest of its kind in the nation.

"We're still acquiring properties down here in the Gulf Coast, but this is an opportunity to expand our expertise and business model into a second area of the country," Evans said.

Oil companies have been drilling in the Bell Creek and Cedar Creek Anticline fields since the 1960s. Conventional drilling depleted much of the "easy oil" by the time Encore acquired the properties in 1999 and 2000. Using secondary recovery methods involving water flooding and carbon dioxide injections,

Encore currently squeezes about 1,200 barrels a day out of Bell Creek. The company estimates that amount could grow to 7,000 barrels a day at the peak of carbon dioxide-enhanced oil recovery operations.

"Encore came in ... and got some more production and had just started using CO2, but Encore hadn't had as much experience with CO2 as some other companies," Schweitzer said in an interview Friday. "At some point Denbury learned about these assets, which were responding very favorably to CO2 injection. Now Denbury is saying that with the addition of CO2 that they are going to be able to increase production there on an annual basis and guarantee production for the next 50 years."

Evans said once shareholders approve the acquisition of Encore, the company will begin the planning and permitting phase for the Wyoming-to-Montana carbon dioxide pipeline. Evans said he expects the pipeline to be completed by the first quarter of 2013.

Not without risks

Scientists and policy makers around the globe are feverishly working to find ways to safely store excess man-made carbon dioxide, the world's most abundant greenhouse gas.

As heat-trapping greenhouse gas levels rise, they say, so do atmospheric temperatures, leading to global warming.

Some see enhanced oil recovery as a useful method of sequestering excess carbon from the atmosphere.

Denbury officials claim that their enhanced oil recovery process is carbon-neutral because they can store more carbon dioxide in depleted oil wells than what will be emitted from burning the oil they recover.

Proponents of carbon dioxide-enhanced oil recovery say it's a win-win: increased domestic oil production reduces our dependence on foreign oil while large amounts of carbon dioxide are safely stored deep beneath the earth's surface where it won't contribute to global warming.

But environmentalist caution that injecting massive amounts of carbon dioxide into the ground isn't without its own set of serious risks.

Anne Hedges of the Montana Environmental Information Center said science-based legal frameworks need to be in place before Montana opens the door to large-scale enhanced oil recovery operations.

"It could be a win-win as long as the sideboards are in place to protect private property and groundwater resources," Hedges said. "It is dangerous to just put carbon dioxide underground without having the proper monitoring and verification programs in place to guarantee that your CO2 is behaving as expected."

Gov. Schweitzer is a proponent of enhanced oil recovery as a method of carbon dioxide sequestration. He points to the Great Plains Synfuels Plant in Beulah, N.D., as a good example of the practice being put to

use. That plant exports about 152 million cubic feet of carbon dioxide per day through a 205-mile pipeline where it's used for enhanced oil recovery in the Weyburn and Midale oil fields in Saskatchewan, Canada.

"They have been capturing the CO2 from that plant and they have been putting it into a pipeline for the last 15 years," Schweitzer said. "They've stored 40 million tons of CO2 and recovered 100 million new barrels of oil."

But Hedges cautions that scientists still don't know the long-term effects of replacing oil in underground reservoirs with carbon dioxide.

"It's not as simple as you take something out and you put something back in. It's far more complicated than that," Hedges said. "Carbon dioxide is not oil. It does not behave the same as oil, either above ground or below ground. It mobilizes metals in ways that oil never does.

"Different chemical and physical reactions are occurring than what occurred when the oil and gas was just sitting there for thousands of years."

In addition to concerns about the potential for carbon dioxide leaks and groundwater contamination, some scientists now say large-scale underground sequestration is an infeasible method for reducing greenhouse gas levels.

A recent peer-reviewed study published in the Journal of Petroleum Science and Engineering found that the volume of underground space required to store carbon dioxide is five to 20 times larger than previously believed.

"...(I)t renders geologic sequestration of CO2 a profoundly non-feasible option for the management of CO2 emissions," wrote the report's author, Professor Michael Economides of the Department of Chemical Engineering at the University of Houston.

That said, environmentalists aren't opposed to using carbon dioxide for enhance oil recovery as long as the necessary policy and legal precautions are in place.

Hedges said lawmakers in the Montana capital have only just begun the process of implementing rules at the state level that would ensure that the process is done safely.

"Right now we don't have the regulatory framework to make sure that CO2 stays down once we put it down. All we've done so far is set policy," Hedges said