Scientists develop tech to track carbon dioxide

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(AP) -- Scientists have developed a method for detecting and tracking carbon dioxide deep underground, giving the federal government an important tool as people look for ways to keep carbon dioxide and other greenhouse gases from crowding the atmosphere.

Scientists working with the U.S. Department of Energy's National Energy Technology Laboratory used colorless, nontoxic liquids called perflourocarbon tracers to essentially fingerprint carbon dioxide that was injected into a coal seam in northwestern New Mexico.

They followed the carbon dioxide's movement by tracking the tracers.

Using the tracers would help eliminate some of the uncertainty surrounding carbon capture and sequestration, said Brian Strazisar, a physical scientist at the National Energy Technology Laboratory in Pittsburgh.

"There is going to be some sort of requirement that we verify that the carbon dioxide is going where we expect it to and that it's not going back into the atmosphere or into geologic zones that weren't intended. The tracers help with that," he said.

With about one-third of the United States' carbon emissions coming from power plants and other large polluters, scientists have been looking at underground fissures, caverns and coal beds as places where those

emissions can be stored to reduce a buildup of greenhouse gases in the atmosphere.

It's those gases that are being blamed for global warming. The Obama administration established a task force on carbon capture and sequestration and has pledged $4 billion for related research, the goal being to get CCS technology widely deployed within 10 years.

At Pump Canyon near Aztec, N.M., scientists injected about 18,400 tons of carbon dioxide along with the tracers into a coal layer about 3,000 feet below the surface.

Special units set up at three nearby coal bed methane production wells and in shallow bore holes throughout the area monitored for the tracers and the injected CO2. The project lasted about a year.

The technology can measure concentrations as small as parts-per-quadrillion. It can also tell the difference between injected carbon dioxide and CO2 that is naturally produced.

A handful of Western states have started developing laws to regulate the so-called pore space beneath the ground where CO2 can be stored.

But in the New Mexico Legislature this year, critics were concerned about unknowns surrounding carbon capture and storage, related property rights and potential effects on water and oil and natural gas development. They had questions about who would be liable if injected CO2 contaminated an aquifer or mixed with oil or gas, and what would happen if it found its way back to the surface.

The tracer technology can address some of those questions better than other geophysical tools like seismic imaging, said Brian McPherson, a University of Utah professor who was involved in the Pump Canyon

project.

"The tracers are a direct observation. They're less subjective and less interpretive," he said. "We can actually forecast how much a tracer is going to go where and then measure it and watch for it. They will help nail down the uncertainty."

Sean McCoy, manager of the Carbon Capture and Sequestration Regulatory Project at Carnegie Mellon University, wasn't involved in the study but said it appears from the findings that the tracer technology will improve scientists' ability to characterize places where they're thinking of storing CO2 over long periods of time.

"There's great potential, and in the real world, we're definitely going to see carbon capture and sequestration happening. But I think there's going to need to be a concerted push to remove some of the obstacles that are out there right now to get this technology rolled out on a large scale," McCoy said.

He pointed to the cost, pore space ownership issues and liability.

McPherson agreed, saying carbon capture and storage is a "real possibility" for limiting the greenhouse gas but not a silver bullet.

"CO2 storage in the subsurface is just part of everything else that needs to be done, like increasing efficiency and developing better coal combustion technologies that produce less CO2. ... It can be done and these tests and positive results like these tracers are just more evidence that it's something that we should continue examining," he said.