



Weyburn-Midale CO2 Monitoring and Storage Project

The **Weyburn-Midale CO2 Monitoring and Storage Project** is a proposed Carbon Capture and Storage (CCS) project in Canada that would aim to allow the extraction of otherwise unrecoverable oil. Weyburn-Midale represents the largest full-scale CCS field study ever conducted. The project was launched in 2000 by the Government of Canada, the Government of Saskatchewan, Cenovus Energy (formerly called Pan Canadian Petroleum and later EnCana) and the Petroleum Technology Research Centre in Regina, Saskatchewan.^[1]

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Project partners

The partners in the project are Shell, the International Energy Agency and the Petroleum Technology Research Centre.^[2]

Funding

On July 20, 2010, the U.S. Department of Energy (DOE) and Natural Resources Canada (NRCan) announced that \$5.2 million has been committed by the two governments to bring the project to conclusion in 2011. NRCan and DOE will partner to renew funding for the International Energy Agency (IEA) project. The renewed endorsements will focus on carbon capture with enhanced oil recovery (EOR). The DOE is providing \$3 million in funding and the Government of Canada has committed \$2.2 million. Weyburn-Midale is conducted in conjunction with \$2 billion of commercial CO2 injection operations. CCS is a primary focus of research conducted by DOE's Office of Fossil Energy (FE) and its National Energy Technology Laboratory (NETL).^[1]

In the United States, CO2 injection has been used to recover nearly 1.5 billion barrels of oil from mature oil fields, and the DOE is looking to deploy the technology widely. The DOE claims as much as 400 billion barrels of oil could be potentially recoverable utilizing EOR. CO2 for injection comes from the Dakota Gasification Company's synfuels plant in Beulah, N.D. and is delivered via a 200-mile (320-kilometer) pipeline. The U.S. is also looking for a large-scale CCS demonstration project, which has yet to prove feasible.^[1]

The project has attracted 16 sponsors from government and industry that, aside from DOE and NRCan, include IEA, Alberta Innovates, Saskatchewan Ministry of Energy and Resources, Japan's Research Institute of Innovative Technology for the Earth, and 10 industry sponsors from Canada, the United States, the Middle East, and Europe. The project's sponsors say a projected 40 million tonnes of CO2 will be stored over the life of the EOR operations in the Weyburn and Midale oil fields. For the Weyburn oil field, 155 million additional barrels of oil are expected to be recovered by 2035 while storing 30 million tonnes of CO2 over the next 30 years. They claim the adjacent Midale oil field will store 10 million tonnes of CO2 while yielding an additional 60 million barrels of oil during 30 years of operation.^[1]

Funding of 2005-2009 Program

On its website the PTRC lists funders of the final phase of the project as being^[3]:

- Apache Canada
- Aramco Services Company
- Chevron
- EnCana Corporation
- OMV
- Nexen Inc.
- Research Institute of Innovative Technology for the Earth (RIITE)
- SaskPower
- Schlumberger
- Shell Canada Limited
- Natural Resources Canada
- United States Department of Energy
- Saskatchewan Industry and Resources

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- Alberta Energy Research Institute

2011 CO2 Leakage

In 2011, CO₂ also leaked from the Weyburn-Midale Carbon Capture Utilization and Storage (CCUS) facility -- at which CO₂ enhanced oil recovery (CO₂ EOR) is conducted -- at a massive scale on a residential property. The leak led to "killing animals and sending groundwater foaming to the surface like shaken-up soda pop," the Canadian Broadcast Corporation reported.^[4] Other partners on the project at the time included Apache Canada, Aramco, Chevron, Schlumberger, and Shell Canada.^[5]

"At night we could hear this sort of bang like a cannon going off," one of the impacted residents, who moved with her husband out of her home shortly thereafter out of safety concerns, told *The Tyee*. "We'd go out and check the gravel pit and, in the walls, it (had) blown a hole in the side and there would be all this foaming coming out of this hole."^[6]

The residents who lived on the property said that when the carbon leaked, "It would fizz and foam" and they eventually moved because "It was getting too dangerous to live there."^[7]

A scientific soil survey report published on the incident found "high concentrations of CO₂ that averaged about 23,000 ppm over most of the property and a major anomaly with concentrations as high as 110,607 ppm in the north central part of the property." The report noted that the CO₂ found at the property matched the chemical properties of that shipped via pipeline from the Great Plains Synfuels Plant in Beulah, North Dakota, while also noting it also found oil seepage as part of the leaked chemical compound,

"Following injection of CO₂ over one month, the injected CO₂ was detected at two producing wells 100 meters and 500 meters from the injection well," the report further details, also explaining that no CO₂ pipelines crossed property lines and the closest CO₂ EOR injection site was a mile away.^[8]

The property-owning family had raised concerns about issues for years prior to the incident, hiring a private scientist instead to perform the research, after failing to get swift action.

"It's a really (sic) story about a government's failure to regulate," Barry Robinson, a staff lawyer with the organization Ecojustice, told *The Tyee*. "A farm couple shouldn't have to hire a private contractor to get a proper study done. The government appears to be in denial about its golden goose."^[9]

Articles and Resources

Sources

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3. "Weyburn-Midale CO₂ Project" (http://www.ptrc.ca/weyburn_partners.php), Petroleum Technology Research Centre website, accessed May 2008.
4. "CO₂ leaks worry Sask. farmers," (<https://www.cbc.ca/news/canada/saskatchewan/co2-leaks-worry-sask-farmers-1.977078>) Canadian Broadcasting Corporation, Jan. 11, 2011
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6. Weber, Bob, "Land fizzing like soda pop: farmer says CO₂ injected underground is leaking," (<https://thetyee.ca/Blogs/TheHook/Environment/2011/01/11/SodaPopFizz/>) *The Tyee*, Jan. 11, 2011
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Related GEM.wiki articles

- Carbon Capture and Storage
- Carbon Capture Utilization and Storage
- CO₂ enhanced oil recovery
- Carbon Capture and Storage demonstration projects worldwide
- Carbon Capture and Storage in Canada
- Hydrogen Energy
- Bravo Dome
- McElmo Dome
- Doe Canyon
- Sheep Mountain
- St. John's Dome
- SACROC
- Lobos Pipeline

- CO2 enhanced oil recovery

External resources

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External Articles

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- Danny Fortson, "Shell's support for carbon capture plant raises hopes for emissions cuts" (<http://www.independent.co.uk/news/business/news/shells-support-for-carbon-capture-plant-raises-hopes-for-emissions-cuts-829326.html>), *The Independent*, May 16, 2008.

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