EERC

PCO2R Partnership

Plains CO_2 Reduction (PCOR) Partnership

Fact Sheet

Practical, Environmentally Sound CO_2 Sequestration

Carbon Storage Monitoring, Verification, and Accounting (MVA)

Carbon storage is a process that injects captured volumes of carbon dioxide (CO_2) deep underground via one or more injection wells. Carbon storage may be a primary or secondary objective of project operators, but both primary (dedicated saline storage) and secondary (associated with CO_2 enhanced oil recovery [CO_2 EOR]) efforts result in the safe and permanent storage of CO_2. MVA refers to the set of actions that operators take to monitor injection operations, verify the CO_2 is stored safely, and account for project-related CO_2.

MVA Methods and Environments

Generally, monitoring environments can be divided into three broad categories from top to bottom: 1) atmosphere, 2) near surface (from surface to lowest underground source of drinking water [USDW]), and 3) deep subsurface (from below lowest USDW to the storage reservoir). Each environment requires its own set of MVA methods to effectively measure CO_2 volumes and fulfill project goals.

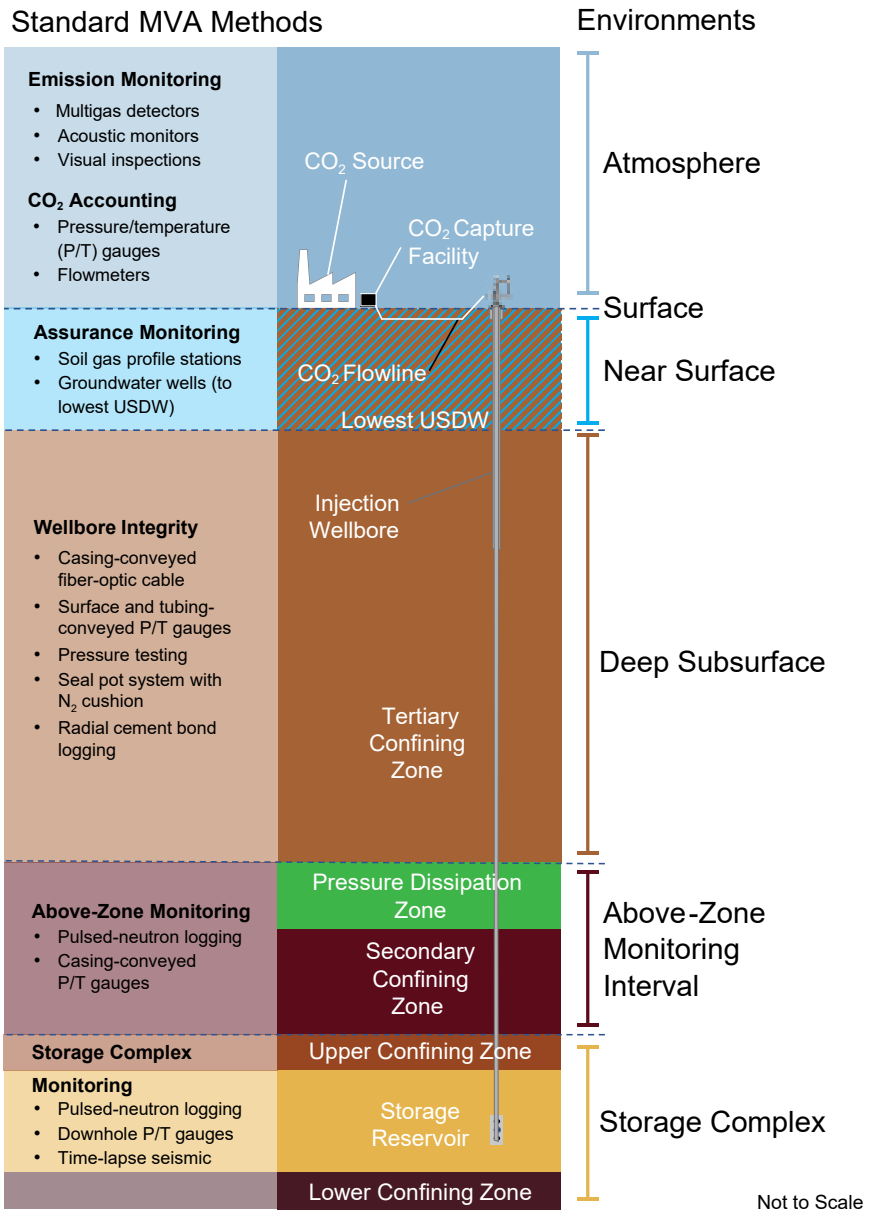
MVA Rules and Regulations

- Maintain an approved testing and monitoring plan as required by the CO_2 injection well permitting authority.
- Report CO_2 emissions and stored CO_2 volumes to the proper authorities (e.g., U.S. Environmental Protection Agency Greenhouse Gas Reporting Program).
- Ensure compliance with MVA incentive programs and/or carbon markets (e.g. low-carbon fuels markets or tax incentive programs).

Why Does MVA Matter?

MVA is critical to:

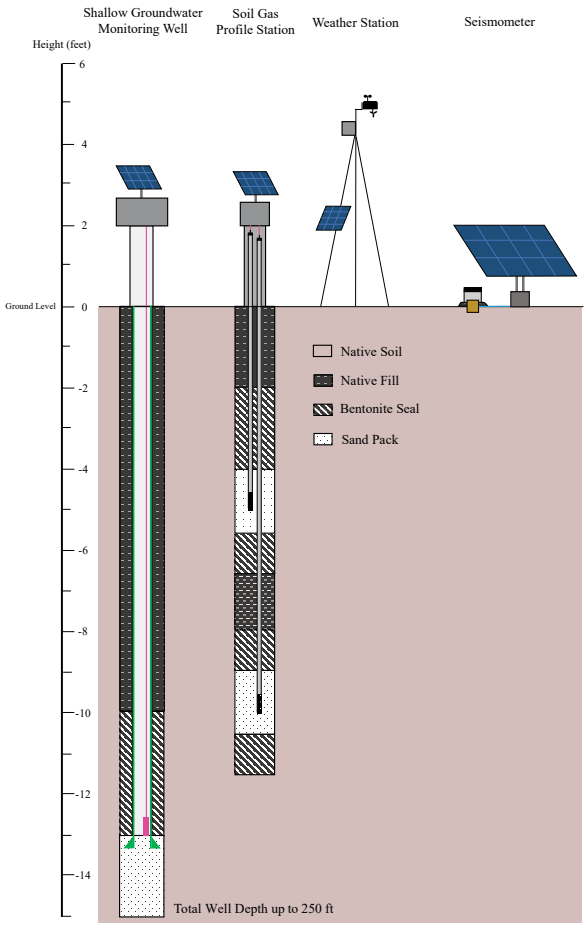
- Protect the health and safety of humans and the environment, including USDWs.
- Verify that wellbore integrity is still intact.
- Track the CO_2 plume and associated pressure front.
- Establish preinjection conditions.
- Account for stored CO_2 volumes.



50+ years of Experience

The U.S. oil and gas industry pioneered utilization of CO_2 for EOR in the oil fields of West Texas during the early 1970s. Since then, many MVA technologies have been either adopted or adapted directly from the oil and gas industry, such as corrosion coupon testing for CO_2 pipelines and time-lapse seismic surveys for imaging the CO_2 plume. Other methods have been directly adopted from other fields, such as soil and groundwater sampling and analysis.

Conceptual Design of an Automated, Integrated, Modular (AIM) Monitoring Network for Future Carbon Storage Projects



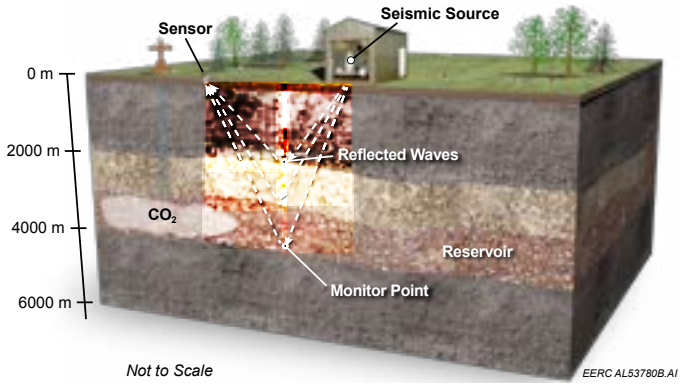
Surface Facilities Equipment Installed at an Active Carbon Storage Site

The Future of MVA

Today, innovative research in carbon storage MVA is centered around developing MVA strategies that are low-impact, cost-effective, and generate real-time continuous data streams to inform decision-making.

The Energy & Environmental Research Center (EERC) is actively working with its PCOR Partnership members at multiple carbon storage sites to test the next generation of MVA methods to accelerate the commercial deployment of carbon storage MVA within the PCOR Partnership region.

Diagram of a Semiautonomous, Sparse Seismic Array (SASSA) Deployed at an Active Carbon Storage Site



The PCOR Partnership, funded by the U.S. Department of Energy's National Energy Technology Laboratory (NETL), the North Dakota Industrial Commission's Oil and Gas Research Program and Lignite Research Program, and more than 250 public and private partners, is accelerating the deployment of carbon capture, utilization, and storage technology. The PCOR Partnership is focused on a region comprising ten U.S. states and four Canadian provinces in the upper Great Plains and northwestern regions of North America. It is led by the EERC, with support from the University of Wyoming and the University of Alaska Fairbanks.

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Visit the PCOR Partnership website at **www.undeerc.org/PCOR**. New members are welcome.

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