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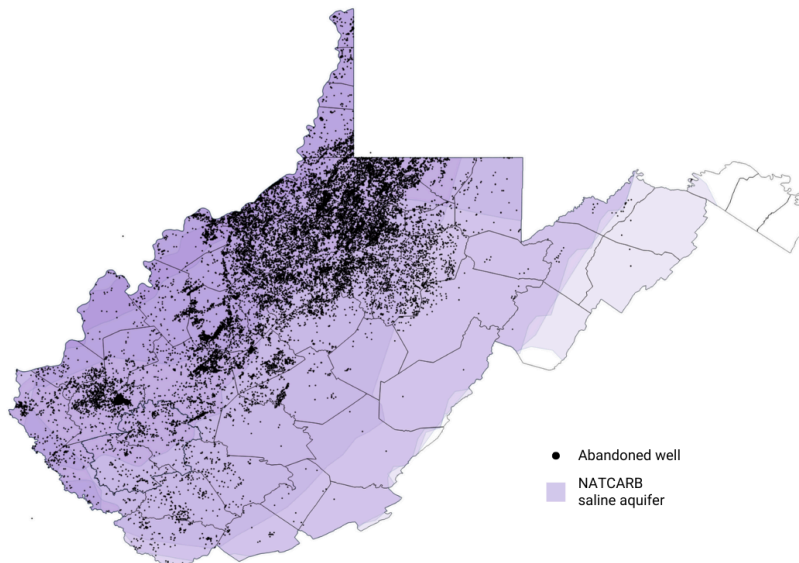
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Tens of Thousands of Abandoned Wells Overlay West Virginia’s Prospective Carbon Storage Reservoirs, Risking Leakage, Report Finds

State Regulators Ill-Equipped to Keep Residents Safe as Federal Funding Pause Halts Well-Plugging Efforts

JOHNSTOWN, Pa. – West Virginia’s prospective underground carbon storage formations are overlaid by tens of thousands of abandoned and improperly plugged wells—and potentially hundreds of thousands of additional undocumented wells—through which injected carbon could leak, according to [new research](#) from the Ohio River Valley Institute. If allowed to migrate, pressurized carbon could pollute groundwater supplies and threaten nearby communities.

Figure 1: Documented abandoned wells and potential carbon storage formations



West Virginia, which will soon begin permitting Class VI carbon injection wells, is home to about 28,500 documented abandoned wells, nearly all of which overlie potential carbon storage locations. Researchers estimate there could be 400,000 additional undocumented abandoned wells across the state whose locations are unknown.

“Improperly plugged and unplugged abandoned wells could wreak havoc for West Virginia’s plans to build out carbon storage infrastructure,” said **author Ted Boettner, Senior Researcher at the Ohio River Valley Institute**. “How much leakage is detected, how much is acceptable, and how it will be managed will be determined by a state agency that has not demonstrated its ability to properly administer other injection well programs and that has just one inspector for every 5,100 documented unplugged wells in the state.”

West Virginia’s serial regulatory failures and its mismanagement of the Class II well program raises questions regarding the ability of state regulators to achieve the constant monitoring required to ensure the integrity of Class VI wells—the wells used for carbon storage—and to keep residents safe from any risks. Class VI wells are significantly more complex than Class II wells and regulators and developers in the U.S. have relatively little practical experience with the geologic storage of carbon dioxide.

As the pause on federal grants and loans halts critical funding for orphaned well cleanup, analysis suggests West Virginia may need to replug over 25,000 improperly plugged wells and thousands more in the future as casings deteriorate.

“Plugging West Virginia’s scourge of abandoned wells is critical to ensuring public health and safety and a minimum first step for developing carbon storage projects in the state. Many of the state’s nominally plugged wells will need to be replugged to modern standards, and even still, the lifespan of a plugged well is largely unknown,” Boettner explains.

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BACKGROUND: WHAT IS CARBON STORAGE?

Carbon capture and storage (CCS) is [expensive and has yet to be demonstrated at commercial scale](#) but is [viewed by proponents](#) as a means for decarbonization. Once pressurized into a “supercritical” gaseous liquid, up to 11.19 billion metric tons of captured carbon could be stored in subsurface saline aquifers in West Virginia, according to [estimates](#) from the Dept. of Energy.

Injecting captured carbon for long-term storage is an unpredictable process that poses risks to underground water supplies and exposes communities to the possibility of blow outs, which can release large volumes of carbon dioxide, a known asphyxiant. Even in the most carefully studied subsurface geologies in the world, researchers [report](#) previously unidentified storage formations, incidents of unintended carbon migration, and formations that unexpectedly rejected CO₂ storage.

WEST VIRGINIA’S FRAUGHT BID FOR CLASS VI PRIMACY

West Virginia will soon begin permitting carbon injection wells. (EPA announced their proposal to grant state primacy to West Virginia in November 2024 and moved to [approve](#) this rule in January 2025. However, due to [an executive action](#), publishing in the Federal Register has been suspended and the final rule has [yet to be promulgated](#).)

Securing primacy over Class VI well permitting allows the state to fast-track carbon storage projects critical to the Appalachian hydrogen hub, or ARCH2, a multi-billion dollar project to develop methane-based hydrogen production facilities across West Virginia, Ohio, and Pennsylvania.

But West Virginia's [fault-ridden regulation of more established underground injection well programs](#) and deficiencies in its [application for Class VI primacy](#) raise questions about state regulators' ability to protect residents from the risks of carbon storage, a significantly riskier activity and one with which few regulators and developers have practical experience.