

## Opposition Testimony Against HB 170 and SB 136 regarding carbon capture and underground storage in Ohio

I am a retired geologist who was involved in several underground methane gas aquifer storage projects in the Midwest, a deep well injection of hazardous liquid waste in Illinois, a co-author of clean coal technology cost/benefit analysis for a U.S. DOE-funded project, and an investigator of underground migration and risk assessments of hydrocarbons in aquifers in Pennsylvania, West Virginia, Tennessee, and Ohio.

In my over 25 years of technical investigations involving and supported by corporations and governmental agencies, the ability to protect drinking water aquifers from underground storage of gaseous and liquid waste products requires the recognition of technical expertise and engineering knowledge that is absent from these two bills.

Underground containment of CO<sub>2</sub> and methane in porous rock formations requires a impermeable caprock above the injection zone, which in depleted oil and gas fields is compromised by the dense number of exploration and production wells, most of which were not sealed shut by proper well completion procedures. These open boreholes are pathways through a caprock that provide for uncontrolled upward migration of injected gas and liquids into the several thousand feet of overlying rock containing drinking water aquifers. Nothing in these bills addresses or makes reference to initial site suitability studies or the technical limitations of environmentally safe injection and removal of stored gas and waste liquids.

An important detail apparently overlooked in these proposed bills is that the withdrawal of underground stored gas results in less than 50 percent retrievability, leaving the remainder in the reservoir free to migrate over the long term. Recovering of the residual gas by high-pressure directional injection using fracking fluids or waste water only creates another environmental risk overlooked by well operators.

The bills patently favor the oil and gas companies promoting these bills, and who will reap profits, liability transfers, and tax breaks without regard to likely future irreversible environmental risks and damages caused by disregarding technical and engineering constraints mentioned above. Unfortunately, it is not apparent that Ohio legislators sponsoring these bills, or that will vote on them, have the requisite knowledge of underground injection control, which underscores the political strategy behind support of these bills.

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