

# Pennsylvania correlates natural gas fracking with quakes

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Pennsylvania environmental regulators have found a likely correlation between a natural gas company's fracking operation and a series of tiny earthquakes in western Pennsylvania last year.

The quakes were recorded last April in Lawrence County, about 50 miles north of Pittsburgh and close to a natural gas well pad owned by Houston-based Hilcorp Energy Co. They were too weak to be felt by humans and no damage was reported.

Fracking, a method to extract gas or oil from underground shale rock, has been tied to earthquakes in neighboring Ohio and other states, but never before in Pennsylvania, the nation's No. 2 natural gas-producing state.

"This is the first time we have seen that sort of spatial and temporal correlation," Seth Pelepko, an official with the state's Department of Environmental Protection, said Friday.

Hilcorp stopped fracking at the well pad after the quakes. Company spokesman Justin Furnace said Friday the company has no plans to resume fracking at the site and will continue to work with the state to address any future concerns.

The company was using a technique at the well called "zipper fracturing," essentially the simultaneous fracking of two abutting horizontal wells. To reduce the likelihood of future quakes, Hilcorp

agreed to discontinue the practice for wells less than a quarter-mile apart in the three townships where the quakes were recorded, DEP officials said.

DEP also required Hilcorp to operate its own seismic monitors in the townships, to notify the agency within 10 minutes of any quakes of 1.0 or greater magnitude and to suspend fracking in the event of larger quakes.

Hilcorp's fracking operations were also blamed for causing 77 earthquakes in Poland Township, Ohio, a few miles from last April's tremors in Pennsylvania. One of the 2014 temblors was magnitude 3.0, strong enough to be felt by residents and "potentially one of the largest earthquakes induced by hydraulic fracturing in the United States," Miami University (Ohio) geologists wrote in a 2015 study.

The Pennsylvania quakes were detected April 25, 2016, less than a month after Hilcorp began fracking four Utica Shale wells in Mahoning Township.

Fracking, the common name for hydraulic fracturing, involves the high-pressure injection of millions of gallons of water, along with sand and chemicals, into a well, shattering the shale rock and freeing the gas. It has very rarely been tied to earthquakes strong enough to be felt.

Pennsylvania is a "relatively quiescent state" when it comes to earthquakes, and rarely experiences strong tremors, Pelepko said. Historically, most earthquakes have been recorded in the southeastern part of the state, far from the shale gas fields in western and northeastern Pennsylvania.

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