Geologic Overview and Activity Update for the Utica-Point Pleasant Shale Play in Ohio

Development and Activity of the Play

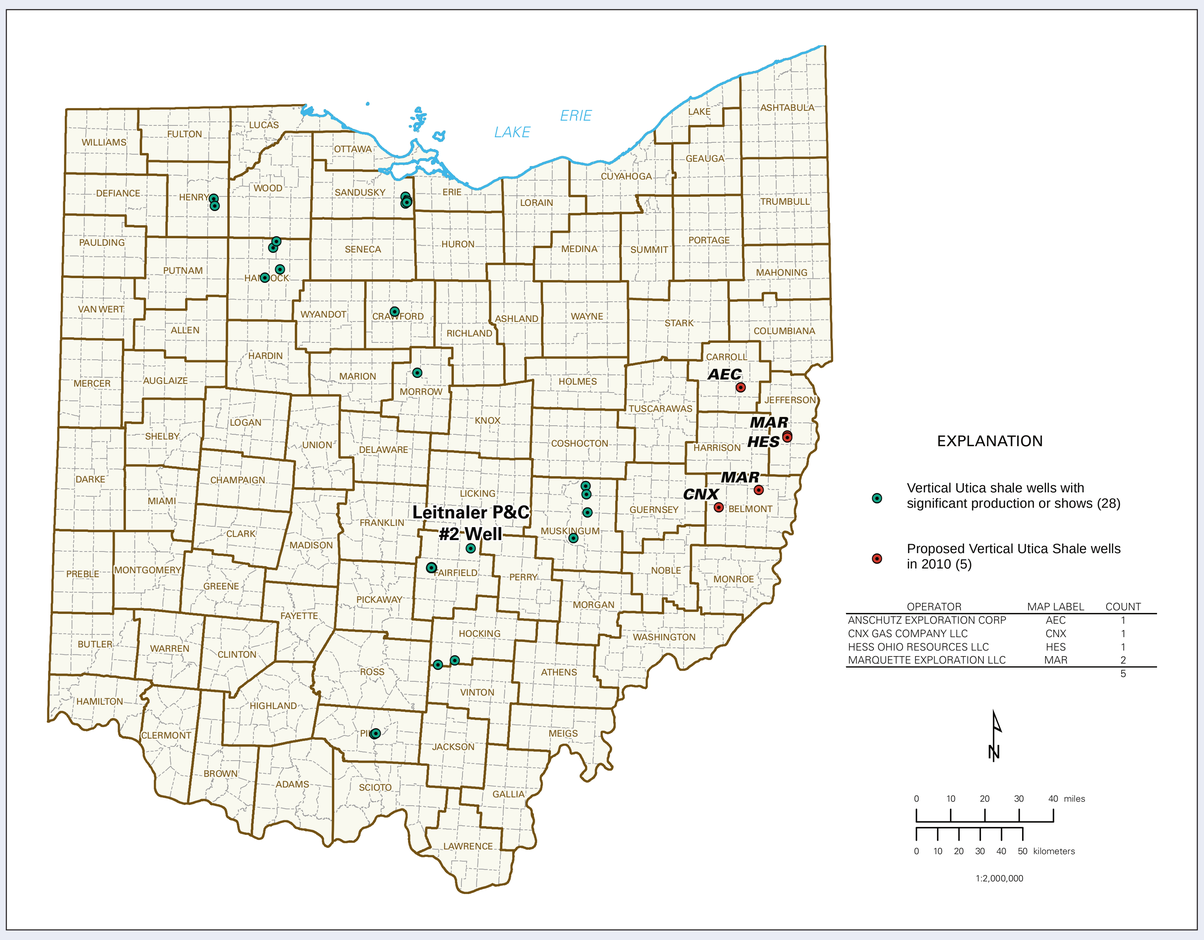

Figure 1.—Exploratory drilling in the Utica-Point Pleasant interval of Ohio began in 2010 with vertical wells. In June 2010 CNX tested 1.5 MMCFGPD in the Utica-Point Pleasant in western Belmont County. Anschutz, Hess and Marquette also had permits for exploratory wells in Ohio by August 2010. Legacy production and shows from this interval are fairly well known in Ohio as shown by wells in green. The most significant of these was the Leitnaker P&C #2 well drilled in Fairfield County in 1998. This well intersected a fault in the Utica-Point Pleasant interval and produced approximately 50,000 barrels of oil naturally during two years.

Abstract

The Ordovician Utica Shale-Point Pleasant Formation interval is shaping up to be the next stop of the "shale gale" in the United States, and Ohio appears to be the primary focus of this play. Leasing activity ramped up in Ohio in late 2010 and continues at a fevered pitch. The first horizontal exploration wells were drilled and completed in the Utica-Point Pleasant in early 2011.

Within Ohio, the Point Pleasant Formation lies directly above the Trenton Limestone and is, at least in part, equivalent with the thick deposits of the Trenton carbonate platform of northwestern Ohio, famous for the Lima-Indiana oil-and-gas trend, which was the first true giant field produced in North America starting in 1884. As the carbonate platform deposits of the Trenton thin, the interbedded organic-rich carbonates and shales of the Point Pleasant thicken, so that over much of Ohio the Trenton is only about 40–60 feet thick, while the Point Pleasant is 150–200 feet thick. The northwestern-Ohio Trenton carbonate platform represents a distal bulge of the ensuing Taconic Orogeny. As the orogenic activity and subsidence increased, the organic-rich Utica Shale proper transgressed the area from present-day east-southeast to west-northwest, eventually overwhelming and drowning the carbonate environments. Thus in the deeper portions of the present-day basin, the Utica (and Antes) is, in part, laterally equivalent and overlies the Point Pleasant.

Analysis of results from source rock geochemistry and early drilling indicate the Utica-Point Pleasant to contain sufficient hydrocarbons to sustain a major drilling play. Oil-source rock pairings indicate the Utica-Point Pleasant has been the primary source for numerous conventional reservoirs in the region. Also, analyses indicate much of the play area in Ohio will be natural gas liquids and oil prone. In fact, a number of historical wells have encountered large shows, and some have produced substantial oil from this interval.

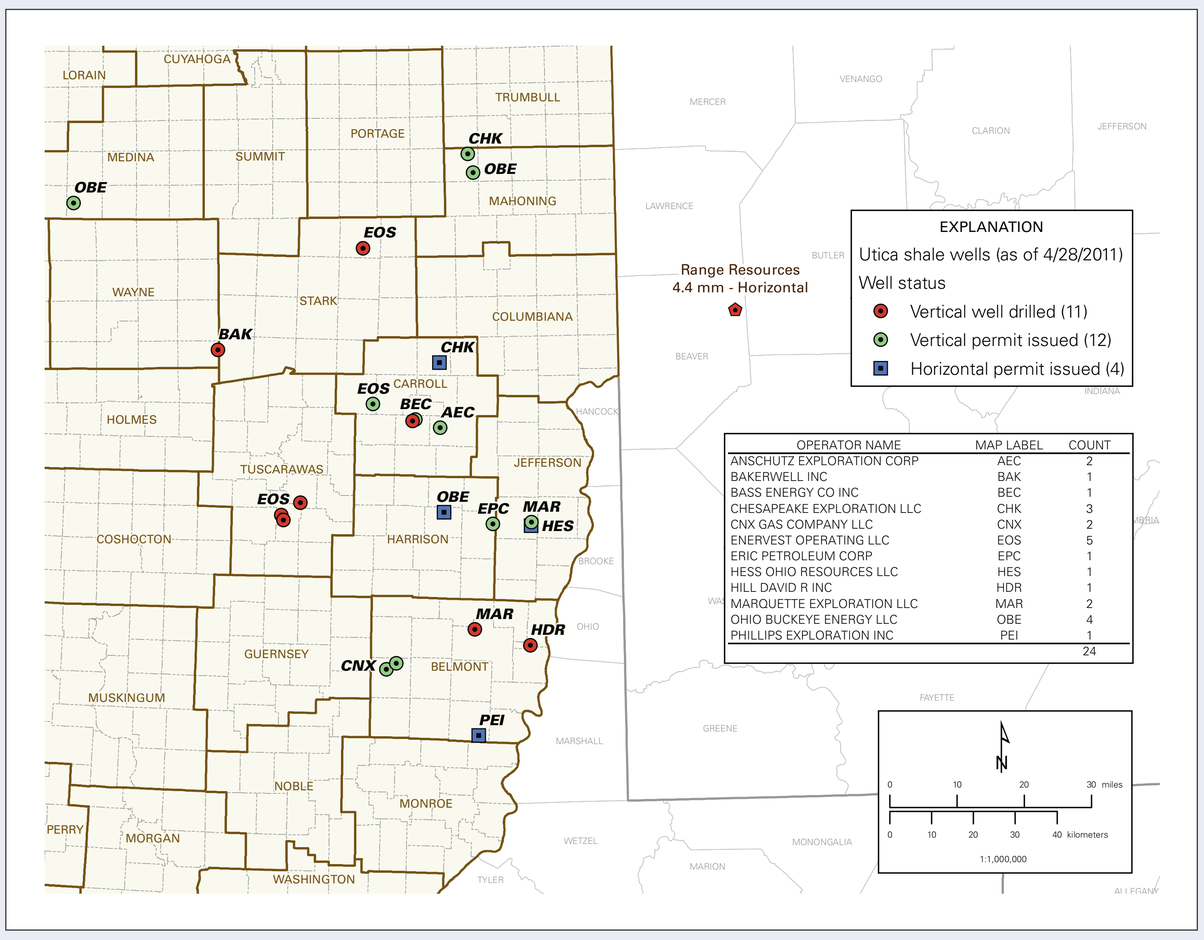

Figure 2.—By early 2011 exploration programs were beginning to take shape via issued permits. Operators were developing drilling pads and drilling an initial vertical test well; many were coring the Utica-Point Pleasant interval. The initial test well would then be plugged back, drilled directionally, and completed as the first horizontal well of the pad. In early 2010 Range Resources announced initial production of 4.4 MMCFGPD from their first horizontal Utica well in Beaver County, Pennsylvania. On March 22, 2011, an 18-stage hydraulic fracture stimulation was completed on the Ohio Buckeye Energy (Chesapeake) Buell #8H well (34067210570100), which was put into production shortly after. This was the first production from a horizontal Utica-Point Pleasant well in Ohio.

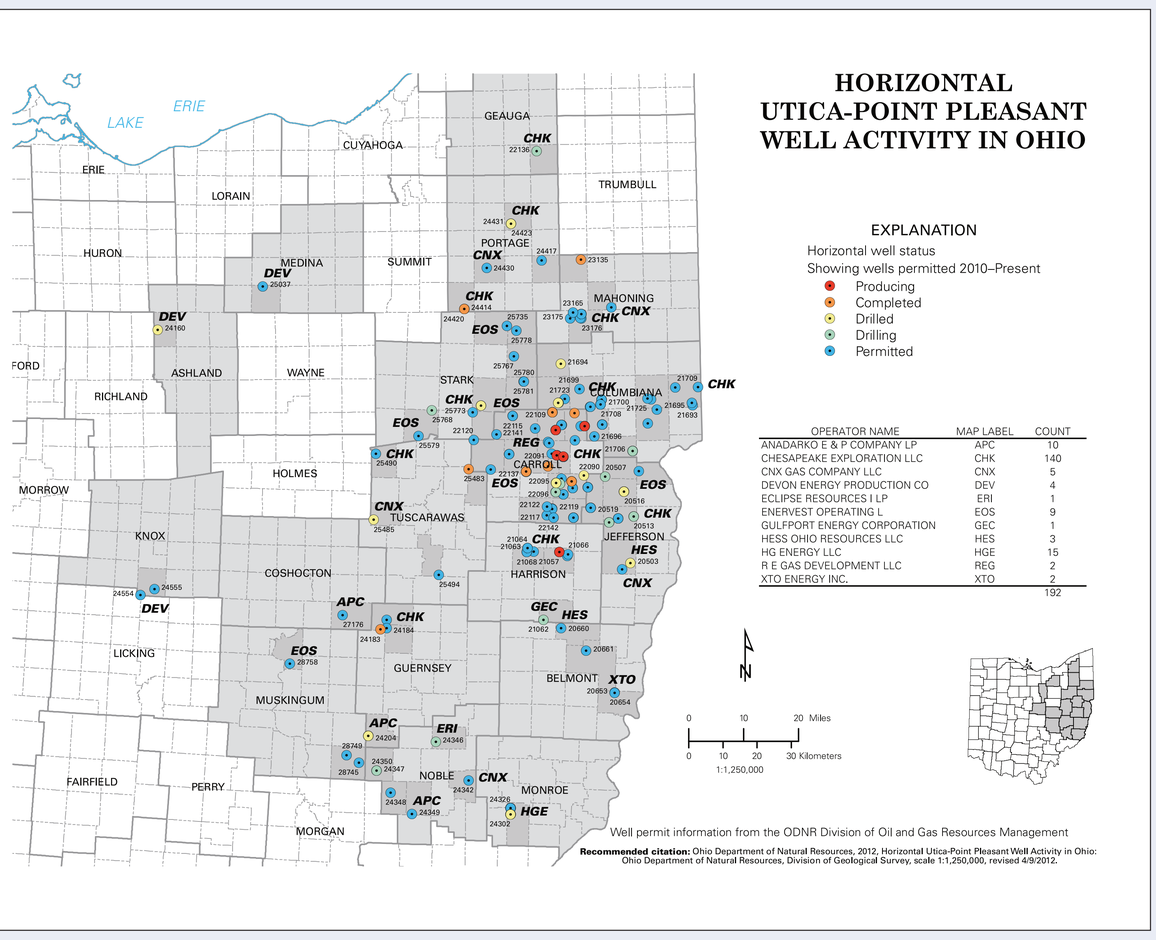

Figure 3.—With more frequent and densely spaced permitting, the Ohio Geological Survey stopped showing vertical (test) wells on it activity maps. This map shows the Utica-Point Pleasant horizontal well-permitting and drilling activity as of April 9, 2012. This map and accompanying spreadsheet are updated monthly on the Survey website at www.OhioGeology.com. As of that date 192 horizontal permits had been issued and 58 drilled. Twenty-one rigs capable of drilling these wells were active in the state.

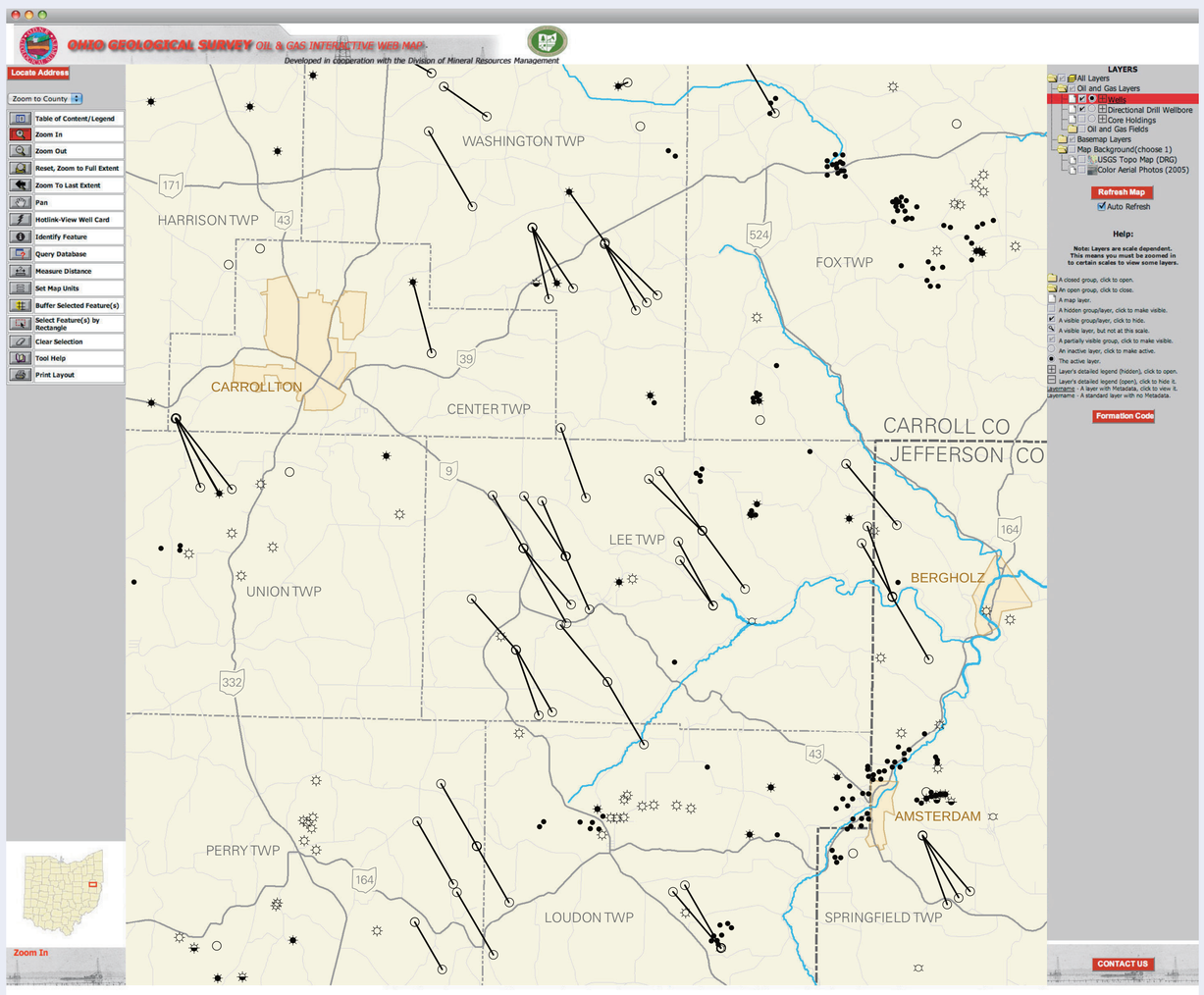

Figure 4.—Thus far, Carroll County in central-eastern Ohio has had the most wells drilled and permitted within the play. This map shows the permitted wells' top and bottom hole locations. Note that wells in this portion of the state are oriented NW-SE to intercept NE-SW-oriented natural fractures. Well maps can be generated using the interactive map service at www.OhioGeology.com.

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