

An Overview of the Conasauga Formation Shale Gas Play in Alabama (July 2009)

The Conasauga Formation shale gas play has been developed primarily in St. Clair County in northeast Alabama. In addition, one well has been drilled in Etowah County, one in Cullman County, and two in Bibb County. Etowah and St. Clair Counties are located northeast of Birmingham in the Appalachian Fold and Fault Region of Alabama. Cullman County is north of Birmingham in the Black Warrior Basin Region, and Bibb County is located southwest of Birmingham in the buried Appalachian Fold and Fault Region.

In February 2007, the State Oil and Gas Board (Board) established the Big Canoe Creek Field in St. Clair County. This field, which is the first shale gas field in Alabama, encompassed approximately 40 square miles when it was established and includes wells drilled by Dominion Black Warrior Basin, Inc. (Dominion), and successor operator, HighMount Black Warrior Basin, LLC (HighMount). The Board's order establishing the field required that it be developed initially on 320-acre drilling units. Permanent production units were not established due to insufficient technical data. The Board further required that the operator address the matter of permanent production units within one year and that production royalties be escrowed until final production units were established.

Dominion had drilled 16 wells in the field from 2005 through 2007, ranging in depth from 3,412 feet to 9,023 feet. In July 2007, Dominion sold its Alabama assets, including the Big Canoe Creek Field, to Loews Corporation. The new operator, HighMount, became operator of record for these wells in May 2008.

In April 2008, the Board ordered that HighMount be given until March 16, 2009, to obtain sufficient technical data to unitize the field or establish production units. The Board also ordered that production royalties continue to be escrowed until permanent production units were established. At a hearing in March 2009, the Board entered an

order approving the establishment of 320-acre production units, authorizing the distribution of all escrowed royalties, reducing the size of the field, and expanding the productive interval of the Conasauga Shale Gas Pool.

HighMount drilled two wells in the Big Canoe Creek Field in early 2008. The first was the Hall E32-14-32 well, Permit No. 15536, located in Section 32, Township 13 South, Range 4 East. The Hall well was drilled to a total depth of 4,801 feet, and production casing was set to a depth of 4,793 feet and perforated from 2,150 to 2,170, 3,800 to 3,830, 4,290 to 4,310 and 4,660 to 4,680 feet in the Conasauga Formation. The zones associated with these perforations were hydraulically fractured in May 2008, and during June 2008 HighMount conducted a first production test for the well. During the 24-hour test, the Hall well flowed at a rate of 84 Mcf of gas per day and 3 barrels of water per day from the Conasauga perforations. The well began producing into a pipeline in May 2008, and through June 2009 it had produced 13,053 Mcf of gas.

HighMount also drilled the Bearden E26-11-29 well, Permit No. 15535, in 2008 at a location in Section 26, Township 13 South, Range 4 East. The Bearden well was drilled to a total depth of 4,809 feet. Surface casing was set to a depth of 1,812 feet; however, no production casing was set, and the well was not hydraulically fractured. In April 2008, the Conasauga was tested open hole from the base of surface casing to total depth. During the 24-hour initial production test, the well produced at a rate of 8 Mcf of gas per day. The well began producing into a pipeline in February 2008, and through June 2009, it had produced 2,826 Mcf of gas.

The latest production information submitted to the Board by HighMount showed 12 wells in the Big Canoe Creek Field produced a total of 2,460 Mcf of gas during June 2009. The above-referenced Hall E32-14-32 well was the most productive well during June, producing a total of 444 Mcf of gas. Cumulatively, 13 wells in the field have produced a total of 160,331 Mcf of gas through June 2009.

Energen Resources Corporation drilled two wells in St. Clair County in 2006 outside of the boundaries of the Big Canoe Creek Field: the Williams 29-12-101 well, Permit No. 14313, in Section 29, Township 14 South, Range 3 East; and the McAnulty et al 20-11 No. 1, Permit No. 14667, in Section 20, Township 14 South, Range 3 East. The Williams well was drilled to a total depth of 4,840 feet, and production casing was set to 3,522 feet. No test results have been reported for this well, which was classified as temporarily abandoned as of July 2009. The McAnulty well was drilled to a total depth of 2,365 feet and was plugged and abandoned in 2007 due to drilling problems. In 2006, Energen drilled the GAA 23-12 No. 1 well, Permit No. 14351, in Section 23, Township 12 South, Range 5 East, in Etowah County. The well was plugged and abandoned at a depth of 4,850 feet.

Rock units in this area of the State are highly folded and faulted making geologic interpretations difficult. Thrust faults, which are low angle reverse faults, are the principal faulting mechanism in the area. These faults can cause an exaggerated thickness (up to several thousand feet) for the Conasauga as a result of stacking of faulted strata. The Conasauga is Middle to Late Cambrian in age (over 500 million years old). Drilling in the Valley and Ridge Province has been challenging due to the unique geologic conditions encountered in the area. Problems include lost circulation, swelling of clays, and well-bore drift.

In June of 2007, Choctaw Geological Enterprises (Choctaw), an MBCI Enterprise, drilled a Conasauga shale test outside of the Valley and Ridge Province in Section 26, Township 9 South, Range 2 West, in Cullman County. The Haynes Farms, LLC 26-8 No. 1A, Permit No. 15288, was drilled to a total depth of 8,320 feet. Surface casing was set to a depth of 3,974 feet and a liner was set from 3,678 feet to 6,588 feet. Vantage Energy Black Warrior, LLC, became operator of the well in June 2008. As of July 2009, the well was classified as temporarily abandoned by the Board until April 2010. Prior to the drilling of the No. 1A well, Choctaw had drilled two wells on the same location but encountered drilling problems and did not reach the proposed total depth. The No. 1A well was drilled about one-half mile from the F. W. Smith 26-6 No. 1 well,

Permit No. 1689, which was drilled to a total depth of 8,270 feet and then plugged and abandoned in 1972 by Shenandoah Oil Corp. & Occidental Petroleum.

Energen Resources Corporation received a permit to drill the Krout 10-14 #1 well, Permit No. 15499, a 12,000-foot Paleozoic test in western Bibb County, in December 2007. The Krout well is located in Section 10, Township 22 North, Range 9 East and was spudded on January 26, 2008. On January 29, 2008, Chesapeake Appalachia, L.L.C., became operator of record. The Krout well reached a total depth of 10,716 feet during March 2008. Four casings were set in the well: 20-inch conductor casing to 60 feet, 13 3/8-inch conductor casing to 206 feet, 9 5/8-inch surface casing to 4,760 feet, and 7-inch production casing to 8,707 feet. Energen Resources Corporation re-assumed operatorship of the well in September 2008. In October 2008, the Krout well was hydraulically fractured through perforations from 8,230 feet to 8,232 feet and 8,323 feet to 8,327 feet in an unnamed Paleozoic formation. No production test had been filed with the Board, and the well was shut-in as of July 2009.

Energen Resources Corporation received a permit to drill a second 12,000-foot Paleozoic test, the Marchant 22-16 No. 1 well, Permit No. 15498, in western Bibb County in December 2007. The proposed depth was later amended to 14,000 feet. The Marchant well, located in Section 22, Township 22 South, Range 7 West, was spudded in April 2008 and reached a total depth of 12,404 feet in May 2008. Chesapeake Appalachia, L.L.C., became the operator of record during the drilling of the well. Three strings of casing were set in the Marchant well: 13 3/8-inch conductor casing to 522 feet, 9 5/8-inch surface casing to 2,524 feet, and 4 1/2-inch production casing to 12,404 feet. The well was perforated in several intervals from 11,558 feet to 12,286 feet in the Conasauga Formation. The perforated intervals were hydraulically fractured during August and September 2008. No production test had been filed with the Board, and the well was shut-in as of July 2009.