

Operator: United Producing Company
 Farm: Lon B. Rogers et al
 Well No.: 14-2694
 Location: Buchanan County
 4300' S of 37°20')
 4500' E of 81°55') approximate
 Elevation: 2364.0' Ground
 Total Depth: 5226'
 Drilling Commenced: July 1, 1958
 Well Completed: December 15, 1958
 Result: Gas well

Geologic log has been prepared by R. J. Voitsberger, VDMR, 1959.
 The summary below represents additional study and observation by Marshall
 S. Miller, VDMR, 1970-71.

<u>Depth</u>	<u>Thickness</u>	<u>Description</u>
40- 89	49'	Siltstone, gray to tan, micaceous, locally shaly and siliceous. Occasional stringers of fine grained sandstone
89-113	24'	Shale, gray, finely micaceous
113-137	24'	Sandstone, light gray to tan, fine grained, subround, moderately sorted, with abundant muscovite, biotite, phlogopite, scattered coal fragments, hematite and traces of feldspar
137-162	25'	Sandstone, light gray to white, fine grained, subangular to subround, moderately sorted, with "speckled" appearance, speckled with various dark minerals, is micaceous (muscovite, biotite, chlorite), also dark carbonaceous material, and scattered hematite. Occasionally interbedded with a medium grained, poorly sorted sandstone. Coal is present in minor amounts from 137' - 162'. Estimated 1' coal (139-140).
162-216	54'	Sandstone, white, medium grained to fine grained, occasionally coarse grained, subangular to subround, poorly sorted with large flakes of muscovite, chlorite, and occasional feldspar, coal, and iron (limonitic) stains. Few stringers of siltstone present.

216-238	22'	Shale, gray, locally silty
238-268	30'	Sandstone, light gray, gray, fine grained, sub-round, moderately sorted, micaceous (muscovite, biotite, phlogopite, chlorite) with lesser amounts of hematite and carbonaceous material, interstitially silty
268-288'	20'	Shale, gray, micaceous
288-302	14'	Sandstone, light gray, fine to medium grained, subrounded, moderately sorted, with abundant mica flakes, chlorite, and biotite, with traces of feldspar. Coal present (292-302).
302-340	38'	Sandstone, light gray, medium grained, subangular to subrounded, poorly sorted, micaceous
340-435	95'	Shale, gray, silty and interbedded with a fine grained, micaceous, sandstone
435-468	33'	Sandstone, light gray to white, fine grained, subround to subangular, moderately to well sorted, with abundant chlorite, biotite and muscovite
468-512	44'	Sandstone, white, coarse grained, interbedded with a gray to tan siltstone and a gray shale
512-624	112'	Shale, gray to dark gray
624-637	13'	Sandstone and siltstone
637-702	65'	Sandstone, light gray, fine to medium grained, subround to subangular, poorly sorted with abundance of muscovite, biotite, hematite, carbonaceous material, and lesser amounts of feldspar, chlorite, and phlogopite. Coal is present in interval (649-655).
702-734	32'	Siltstone, dark gray, micaceous
734-830	96'	Sandstone, white, fine to medium grained, subround to subangular, moderately sorted with abundant chlorite, muscovite, scattered feldspar and carbonaceous material; 70 to 75% quartz

830-844	14'	Coal mostly. Driller notes coal (838-840).
844-880	36'	Sandstone, white, medium grained but silty, and micaceous
880-900	20'	Shale, gray, locally silty
900-914	14'	Sandstone, like that above
914-961	47'	No samples
961-1138	177'	Siltstone; siliceous and micaceous, grades downward to a very fine grained sandstone
1138-1161	23'	No samples
1161-1212	48'	Sandstone, white, fine grained, subround, well sorted, micaceous
1212-1283	71'	Shale, gray, dark gray, locally silty
1283-1354	71'	Interbedded; sandstone, siltstone, and shale
1354-1365	11'	Siltstone, gray, micaceous
1365-1406	41'	Interbedded, shale, silty, gray, and fine grained sandstone, micaceous, slightly feldspathic, with abundant coal fragments
1406-1464	58'	Sandstone, white to tan, very fine to occasionally medium grained, subround to subangular, poorly sorted, with feldspar, muscovite, biotite, and carbonaceous material, with lesser amounts of hematite and chlorite
1464-1498	34'	Sandstone, white, fine to medium grained, moderately sorted, with scattered muscovite, chlorite, carbonaceous material and feldspar, 70 to 80% quartz
1498-1539	41'	Shale, gray, carbonaceous, locally silty. Sand stringers in bottom intervals
1539-1543	4'	Missing

1543-1780	237'	Sandstone, white to light gray, mostly fine grained, subround to subangular, moderately sorted, with abundant amounts of micaceous minerals, iron minerals and lesser amounts of carbonaceous material and feldspar
1780-1931	151'	Shale, mostly gray, locally carbonaceous, with stringers of sand like that above in intervals (1790-1795) (1807-1819) (1819-1840)
*1931-1980	49'	Sandstone, white, fine to medium grained, subround, to subangular, moderately to well sorted, quartzose, with scattered muscovite, and dark carbonaceous material, and rounded rock fragments, 90 to 95% quartz, with silica and calcareous cement
*1980-2031	51'	Sandstone, white, quartzose, mostly medium grained, but occasionally fine and coarse grained, subround to subangular, moderately sorted with very little to no matrix or visible cementing material, 95 to 100% quartz
2031-2040	9'	Siltstone, gray, argillaceous and micaceous
2040-2041	1'	Coal, pure to impure, conchoidal fracture, with plant fragments
2041-2139	98'	Shale, gray to dark gray, finely micaceous, locally silty, with interbeds of sandstone in lower intervals
2139-2160	21'	Sandstone, light gray, fine to medium, subangular, poorly sorted, interstitially silty, with abundance of micas, carbonaceous material, reddish iron mineral and traces of feldspar
2160-2170	10'	Coal, mostly, pure to impure, vitreous luster, conchoidal and blocky fracture
2170-2176	6'	Sandstone, light gray, fine to medium grained, subround to subangular, poorly sorted, micaceous, slightly feldspathic, interbedded with siltstone

2176-2182	6'	Coal, very good show, pure with good conchoidal fracture, blocky fracture, vitreous luster. Pocahontas #3 coal
2182-2187	5'	Sandstone, like the interval (2170-2176) except with finely dispersed coal fragments
2187-2199	12'	Sandstone, siltstone and shale
2199-2231	32'	Sandstone, light gray, fine grained, micaceous, slightly feldspathic, grades downward to a siltstone
2231-2241	10'	Shale, dark gray, with sand stringers
2241-2244	3'	Coal, pure to impure, blocky fracture
2244-2290	46'	Sandstone, fine to medium grained, subround to subangular, poorly sorted, micaceous, slightly feldspathic, with hematite and abundant dark rock fragments, lesser amounts of shale in upper interval (2244-2270)
2290-2304	14'	Coal and shale, coal estimated to be present (2300-2304); is pure to impure, vitreous luster with blocky fracture
2304-2358	54'	Siltstone, with lesser amounts of ironstone, shale, and coal, grades downward to a grayish green, fine grained, poorly sorted sandstone
2358-2368	10'	Shale, gray, micaceous
2368-2378	10'	Sandstone, white to light gray, fine to medium grained, subangular, poorly sorted, with abundant rock fragments, scattered carbonaceous material, red hematite, rare chlorite
2378-2388	10'	Shale, gray, hard and brittle
2388-2456	68'	Sandstone, light gray to white, fine grained, occasionally medium grained, subround to subangular, with scattered muscovite, and dark rock fragments, about 65 to 70% quartz, clay and calcareous cement
2456		Green, calcareous, shales and siltstones, with siderite nodules

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2456-2466	10'	Pastel greenish-gray shales and lesser amounts of red shale. Red "mottling" and nodular red coloring occurs abundantly with the greenish gray shales, shales are slightly calcareous
2466-2540	74'	Red, calcareous, shale mostly, lesser amounts of pastel green and gray shales, shales variegated, occasional pyrite and calcite present.
2540-2548	8'	Dark gray calcareous shale, 60%; 15% red calcareous shale; 15-20% green, fine grained, calcareous sandstone, 2-5% brown chert
2548-2551	3'	Dark gray calcareous shale, 70%; a white, very fine grained, and very calcareous sandstone, 25%; red calcareous shale 5%
2551-2555	4'	Dark gray, calcareous shale, 60%; white, very fine grained, calcareous sand, 40%
2555-2581	26'	Samples missing
2581-2592	11'	Sandstone, mostly, white to light green, very fine grained, very calcareous, with lesser amounts of brown argillaceous, shaly limestone or dolomite

2592-2600	8'	Sandstone like that above 60% with 20% black shale and 20% red shale, both very calcareous. Voitsberger mentions limestone, none of which could be identified in this interval
2600-2616	16'	Red, green and gray calcareous shales, mostly, lesser amounts of brown chert, dark brown argillaceous limestone, and green siltstone, or very fine grained sand with red nodules
2616-2656	40'	Sandstone, mostly, white to light green, fine grained, micaceous with abundant coaly material, occasional gray, micaceous, shale interbeds which increase downward, 40% of sample (2636-2656)
2656-2671	15'	Sandstone, white, fine grained with muscovite and dark argillaceous and carbonaceous material, interstitially silty
2671-2763	92'	Shale, black, dark gray, very finely micaceous and locally carbonaceous. (*Typical Pride shale) some occasional pyrite and calcite as accessory minerals are present
2763-2784	21'	*Gray, to red to pastel green, calcareous shales, and light brown, argillaceous limestone. *Abundant crinoid stems can be identified by (2770-2784)
2784-2794	10'	Dark gray, green, gray and red shales with light green siltstone
2794-2811	17'	Sandstone, white to light green, very fine grained, micaceous, with interbeds of gray, dark gray, and green shale
2811-2836	25'	Gray and green shale, slightly calcareous, 60% and fine grained, greenish gray, silty sandstone 40% (could be called a coarse grained siltstone)
2836-2890	54'	Red, green, and gray, calcareous shales

2790
 2671

 21'

2790
 2671

 23'

2890-2919	29'	Sandstone, white to light green, very fine grained, with abundant muscovite and dark coaly material, biotite and chlorite, clay and calcareous cement.
2919-2927	8'	Gray, shale, light colored compared to typical dark gray shale of the Pride Formation
2925-2935	10'	Shale like that above, and fine grained, silty sandstone
2935-2955	20'	Shale, gray to dark gray, calcareous, locally silty
2955-3024	69'	Gray, red and olive green calcareous shales with lesser amounts of gray argillaceous limestone with scattered shell fossil fragments, and crinoid stems, considerable pyrite throughout
3024		Red calcareous shale

Bluestone Formation	2456-2763	307'
Pride Shale	2671-2763	92'
Princeton Sand	absent	
Hinton Formation	2763-3403	640'
Falls Mills? Sandstone	2890-2919	29'
Little Stone Gap Member	2955-3024	69'
Stony Gap Sandstone	3237-3403	166'
Bluefield Formation	3403-4060	657'
Greenbrier Formation	4060-4529	469'
McCrary Shale	4529-4617	88'

*The Princeton sandstone cannot be identified in this well and is not present. The Pride shale is very recognizable, but the Princeton Sand which is usually directly below the Pride shale has "gone out". Also three very calcareous and limy, fossiliferous, zones are present in this interval. The Little Stone Gap Member is undoubtedly the lower of the three. The other two were referred to by Reger when he named them the Avis Limestones; upper, middle and lower. A 29' sand interval just slightly above the Little Stone Gap Member could be one of three sand bodies which outcrop in the Tazewell County area, the Neal, the Tallery, or the Falls Mills sand.

Interval reinterpreted later. Princeton sandstone from 2763-2955.