

Operator: Clinchfield Coal Corp.

Farm: Arch Rose

Well No.: 105

Index No.: 45

Location: Dickenson County

7,050' S of 37°10'

12,000' W of 82°20'

Elevation: 1431.3'

Remarks: Elevation and location of well with reference to: measured section No. 98; coal geology along McClure River, NE of Caney Creek, indicate that well located about 200' below Upper Banner coal and 100' above the Kennedy coal. Correlations by Marshall Miller, 1970-74, VDMR.

<u>Formation</u>	<u>Top</u>	<u>Bottom</u>	<u>Thickness</u>
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Pennsylvanian System

Post Lee Formation "in at surface"		679	679'
		Kennedy coal horizon at 100'	
		Aily coal 210-212	
		Raven coal 308-311	
		Jawbone coal 447-450	

Lee Formation	679	1706	1027'
		War Creek coal 1173-1174	
		quartzose sand 679-747	68'
		quartzose sand 830-871	41'
		quartzose sand 989-998	9'
		quartzose sand 1030-1055	25'
		quartzose sand 1084-1091	7'
		quartzose sand 1391-1472	81'
		quartzose sand 1479-1484	5'
		quartzose sand 1506-1608	102'
		quartzose sand 1625-1706	81'
		total quartzose sand 419'	

Mississippian System

Bluestone Formation	1706?	2105	399'
Pride Shale	?	2105	?
Princeton Sand	2105	2288	183'
Little Stone Gap Member	2288	2310	22'
Stony Gap Sand	2685	2728	43'
Greenbrier Formation	3172	3547	375'
Maccrady	3547		

Example

VDMR Well No. W-137

Operator: Clinchfield Coal Corp.

Farm: Arch Rose

Location: Dickenson County

37°08'50"N.

82°22'27"W.

Elevation: 1431.3' Ground

Total Depth: 5364' (5376' SLM)

Drilling Commenced: June 9, 1949

Well Completed: December 22, 1949

Result: Gas well

Geologic summary and correlations by Marshall S. Miller, January, 1971.

Remarks: Well spudded below lower Banner coal.

0- 40	40'	No samples
40-138	98'	Siltstone, gray, light gray, locally siliceous and shaly
138-140	2'	Sandstone, white, very fine grained, subrounded to subangular, well sorted, moderately quartzose
140-145	5'	Siltstone, light gray, gray, grayish brown, tan
145-150	5'	Shale, dark gray, finely micaceous
150-209	59'	Sandstone, light gray, white, very fine grained, subround to subangular, moderately sorted, moderately quartzose, interstitially silty, contains scattered muscovite, chlorite and coaly laminations and interbeds with gray siltstone throughout
210-212	2'	Coal, (depth and thickness from drillers log) some coal is present in sample, is dull, bony
212-230	18'	Siltstone, gray to brown
230-232	2'	Coal, shaly, impure
232-256	24'	Shale, gray, reddish gray, silty
256-286	30'	Sandstone, light gray, fine grained, poorly sorted, subangular, 50% quartz, with abundant clay, micas, rock fragments and feldspar

286-292	6'	Siltstone, gray, finely micaceous, locally siliceous, and carbonaceous
292-308	16'	Sandstone, light gray, fine to medium grained, poorly sorted, 60-65% quartz, considerable chlorite, feldspar, biotite, carbonaceous material, and dark minerals and hematite
308-310	2'	Coal, dull, silty, impure (depth and thickness from drillers log)
310-353	43'	Sandstone, light gray, fine to coarse grained, subangular, poorly sorted, with abundant accessory minerals, micas, and feldspars, and dark rock fragments, carbonaceous material, and reddish iron minerals, siderite, limonite
353-384	31'	Shale, gray, dark gray, finely micaceous
384-434	50'	Shale and siltstone, mostly a silty gray shale
434-476	42'	Sandstone, gray to brown, fine to coarse grained, poorly sorted, subangular, feldspathic and micaceous, locally conglomeratic. A coal present (447-449) pure and impure, with blocky fracture
476-495	19'	Sandstone, light gray, buff, very fine to fine grained, subangular, moderately to poorly sorted, micaceous, silty, feldspathic
495-505	10'	Siltstone, gray, micaceous, shaly
505-548	43'	Sandstone, light gray, very fine to medium grained, poorly sorted, subangular, with abundant muscovite, biotite, chlorite, phlogopite, clay and dark rock fragments
548-679	131'	Siltstone, gray, micaceous, locally shaly, grades downward to a silty shale by 589' and is a dark gray, fissile shale by 616', which is occasionally carbonaceous
*679-747	68'	Sandstone, white, quartzose, medium to coarse grained, subround to subangular, moderately sorted with very little matrix material, rare and scattered micas and dark rounded rock fragments, 90-95% quartz, becomes better sorted and mostly medium grained by 693', medium to coarse grained and conglomeratic by 708'

- 747-757 10' Sandstone and siltstone; sandstone is gray, fine grained, micaceous
- 757-793 36' Siltstone, gray, light gray, locally siliceous, generally micaceous, grades downward to a shaly siltstone by 767' and a silty shale by 776'
- 793-815 22' Shale interbedded with a light gray, medium to coarse grained, poorly sorted sandstone
- 815-830 15' Sandstone, light gray to white, medium to coarse grained, subangular, poorly sorted with scattered but consistent micas, feldspar and dark rock fragments, 75% quartz with abundant clay matrix
- *830-871 41' Sandstone, white, quartzose, mostly medium grained, occasionally coarse grained, subrounded to subangular, moderately sorted, almost 100% quartz, with very little matrix material, becomes well sorted and subrounded by 863'
- 871-904 33' Siltstone, gray, grayish brown, tan, with a few fine grained sand stringers
- 904-973 69' Shale, gray, locally silty, poor-fair fissility, occasional sand stringers in interval (966-973)
- 973-984 11' Sandstone, white, very fine grained, moderately sorted, with abundant white clay matrix speckled with fine coal fragments and fine muscovite, high quartz content, but atypical of the coarser and "cleaner" Lee quartzose sands
- *984-998 14' Sandstone, white, mostly fine grained but occasionally medium grained with less matrix and accessory minerals, a "border line" sand. X-ray analysis indicated the slight presence of feldspar and clay and micas in upper intervals and progressively less downward, sand is thus a quartzose sand, 90-95% quartz in upper interval and 95 to 100% quartz progressively downward
- 998-1005 7' Siltstone, gray, micaceous, shaly
- *1005-1030 25' Sandstone, much like previous interval, remains white but fine grained and occasionally silty with scattered muscovite and clay minerals, but appears to be quartzose, sand becomes medium to coarse grained, less sorted, subangular and interbedded with siltstone 1024-1030. X-ray verified quartzose nature of this sand interval.

*1030-1055	25'	Sandstone, white, mostly fine grained, occasionally medium grained, moderately to well sorted, quartzose, becomes coarser grained downward
1055-1084	29'	Siltstone, gray, finely micaceous
*1084-1091	7'	Sandstone, white, medium to coarse grained, quartzose, X-ray verified pure quartz sand
1091-1099	8'	Siltstone, gray, micaceous, shaly
1099-1107	8'	Sandstone, light gray, fine to medium grained, subangular, poorly sorted, micaceous with abundant rock fragments and accessory minerals
1107-1123	16'	Shale, gray, dark gray, locally silty, interbeds with sandstone and siltstone like that above (1107-1123)
1123-1189	66'	Sandstone, light gray, fine to coarse grained, subangular, very poorly sorted, micaceous, with abundant accessory minerals: muscovite, biotite, chlorite, phlogopite, feldspar, hematite, limonite, siderite, rock fragments and carbonaceous material. A coal possibly present (1173-1174).
1189-1207	18'	Shale, dark gray, locally carbonaceous
1207-1280	73'	Siltstone, light gray, buff, siliceous, with coaly laminations
1280-1327	47'	Shale, gray, dark gray, pebbly, hard and brittle
1327-1337	10'	Sandstone, light gray, gray, fine to coarse grained, subangular, poorly sorted, micaceous, interstitially silty, low quartz percentage
1337-1353	16'	Shale, dark gray, carbonaceous
1353-1391	38'	Sandstone, light gray, fine to medium grained, subangular, poorly sorted, silty with rounded rock fragments, dark minerals, and scattered micas, feldspar, reddish iron minerals and carbonaceous material

- *1391-1399 8' Sandstone, white, quartzose, medium to coarse grained, subround to subangular, moderately sorted, 95 to 100% quartz
- *1399-1429 30' Sandstone, white, but iron stained, generally fine grained, subround to subangular, moderately sorted, quartzose with little or no matrix material
- *1429-1472 43' Sandstone, white, quartzose, coarse grained and conglomeratic, no matrix material, 100% quartz. X-ray verified pure quartz
- * 1472-1479 7' Sandstone, light gray, fine to coarse grained, subangular, poorly sorted, with traces of feldspar, and dark rock fragments, also scattered micas present, X-ray indicated only trace of feldspar, and little of anything else but quartz
- *1479-1484 5' Sandstone, white, quartzose, medium to coarse grained, subangular, locally iron stained with no matrix material, occasional trace of feldspar present, X-ray verified pure quartzose sandstone
- 1484-1506 22' Sandstone, light gray to brown, fine to coarse grained, poorly sorted, subangular, slightly calcareous with abundant muscovite, biotite, chlorite, feldspar, and clay matrix, low quartz percentage which increases downward. X-ray indicated presence of clay, kaolinite, chlorite, muscovite, biotite, siderite, plagioclase, feldspar, and some calcite.
- *1506-1525 19' Sandstone, white, but iron stained, quartzose, fine grained, subrounded, well sorted, no matrix material, X-ray verified pure quartz content.
- *1525-1608 82' Sandstone, white, quartzose, medium to coarse grained, subangular to subround, moderately sorted, no matrix material, conglomeratic (1525-1530) (1590-1608)
- 1608-1625 17' Sandstone, white to light gray, fine to coarse grained, subangular, poorly sorted, with rounded rock fragments and traces of feldspar. X-ray indicated abundant clay, chlorite, muscovite, with traces of feldspar.
- *1625-1681 56' Sandstone, white, fine to medium grained, subround to subangular, moderately sorted, quartzose

*1681-1703	22'	Sandstone, white, quartzose, coarse grained, conglomeratic
1703-1706	3'	Sandstone, fine grained, poorly sorted with clay silt matrix, non-quartzose
1706-1712	6'	Missing
1712-1724	12'	Shale, dark gray, carbonaceous
1724-		Greenish-gray and red shales