

GEOLOGICAL RECORD

ANR Production Co. #3 VICC  
N 259385 E 832305 WI 52F  
Wise County, Virginia

Drilling Contractor: Falcon Drilling Co.  
Spud: Jan. 27, 1982  
Drilling Completed: Feb. 18, 1982  
Elevation: Gr 2167.50 RF 2177.51 KB 2178.51  
Record by: Paul Mescher  
Casing: 9 5/8" @ 850' 7" @ 2706'

FORMATION RECORD

PENNSYLVANIAN

0' - 150'	No samples
150' - 160'	Sand, fine grain, lt gry, & sandy shale with trace <u>coal</u>
160' - 190'	Shale, gray sandy
190' - 210'	Sand, white, fn grn
210' - 222'	Shale, drk gry, platy
222' - 230'	Sand, white fn grn and shale drk gry
230' - 280'	Shale, gray, platy, micaceous, with sandy shale
280' - 328'	Shale, drk gry with sandy gry shale
328' - 397'	Sand, white, fn grn, angular, 350' - 370' sand, fn grn crystal white
397' - 415'	Sand aa with shale, blk, mica
415' - 490'	Sand, white, fn grn, angular with interbedded shale drk gry, and silty shale
490' - 500'	Sand and shale aa with trace <u>coal</u>
500' - 600'	Sand, white, fn grn with interbedded shale, gray, sandy and silty
600' - 610'	Sample missing
610' - 640'	Shale, dark gry, sandy
640' - 654'	Sand, white, fn grn
654' - 670'	Shale, drk gry, platy, silty and sand aa
670' - 680'	Shale & sand aa with trace <u>coal</u>
680' - 700'	Sand, white, fn grn, sandy shale, and shale, drk gry
700' - 750'	Shale, drk gry, platy with silty and sandy shale
750' - 760'	Sand, white, fine grn, silty
760' - 770'	Samples missing
770' - 780'	Shale, gry, sandy with trace <u>coal</u>
780' - 800'	Shale, drk gry, silty
800' - 820'	Sample missing
820' - 860'	Sand, white, fn grn with interbedded shale gry and sandy shale
860' - 920'	Sand, white, fn grn, silty
920' - 930'	Sand aa with shaly sand
930' - 940'	Sand, wh, fn grn
940' - 990'	Shale, gray, silty

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- 990' - 1020' Shale, drk gry, sandy with mica
- 1020' - 1050' Sand, white & gry, fn grn
- 1050' - 1070' Sand, gray, silty and shaly
- 1070' - 1160' Sand, white, fn grn
- 1160' - 1190' Shale, gry, silty and sandy
- 1190' - 1260' Sand, white, fn grn
- 1260' - 1290' Sand, gray-white, shaly, mica
- 1290' - 1300' Shale, gry, silty
- 1300' - 1330' Sand, gry-wh, fn grn, silty, mica
- 1330' - 1350' Shale, gry, silty, and sandy shale
- 1350' - 1370' Shale, gry, silty
- 1370' - 1380' Shale, black with coal
- 1380' - 1390' Sand, white, fn grn
- 1390' - 1430' Sand, white, fn & med grn, well-rounded to angular
- 1430' - 1440' Sand, aa, very mica, with shale, gray, with coal
- 1440' - 1470' Shale, gry, silty, mica
- 1470' - 1480' Sand, white, fn grn some shale gry mica.
- 1480' - 1490' Sand gry very shaly
- 1490' - 1530' Shale, gry, silty
- 1530' - 1690' Sand, wh, very fn grn (1640' to 1660' very silty)
- 1690' - 1700' Shale, gry-brn, silty
- 1700' - 1720' Shale, brown, silty (trace coal 1710' - 1720')
- 1720' - 1730' Sand, white, very fn grn to silty. Shale, gry-brn
- 1730' - 1760' Sand, lt gry, very fn grn silty (almost powder)
- 1760' - 1780' Shale powder, light brown silty
- 1780' - 1790' Shale, blk-brn. coal
- 1790' - 1800' Sand, very fn grn, lt gray with drk gry shale
- 1800' - 1860' Sand, very fn grn, lt gray, very silty
- 1860' - 1950' Sand, lt gry, fn grn some med grn sand
- 1950' - 1960' Shale, lt brn, silty
- 1960' - 1970' Silt, lt gry to brn, shaly
- 1970' - 1980' Silt, lt gry to brn, shaly. some coal.
- 1980' - 1990' Sand, lt gry, fn grn, with shaly sand, some blk shale
- 1990' - 2020' Sand, lt gray, fn to med grn silty
- 2020' - 2030' Sand aa with shale, gray and black
- 2030' - 2050' Sand, very fn grn, silty with mica
- 2050' - 2060' Sand, fn to med grn, angular and round
- 2060' - 2070' Sand, very fn grn. coal
- 2070' - 2080' Silt, shaly, lt brown
- 2080' - 2090' Sand, very fn grn silty mica. trace coal.
- 2090' - 2100' Sand, very fn grn silty mica. trace coal.
- 2100' - 2110' Sand, fn and med. grn, round and angular
- 2110' - 2130' Sand, white, fn grn, mica.
- 2130' - 2196' Sand, gray fn grn, silty, mica.

BASE LEE FORMATION 2196' (-18')

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Top MISSISSIPPIAN - Pennington Formation

2196' - 2230' Shale, drk gry silty, with traces red shale  
 2230' - 2240' Sand, lt gray, very fn grn  
 2240' - 2250' Shale, gry, silty  
 2250' - 2260' Sand, lt gry, very fn grain, silty, mica.  
 2260' - 2270' Shale, gray, calcareous  
 2270' - 2280' Siltstone, shaly, brown and red  
 2280' - 2290' Shale gray  
 2290' - 2300' Shale, gray and black, silty  
 2300' - 2330' Shale- siltstone, gray, some red shale  
 2330' - 2400' Sand, very fn grn, silty, 2340' - 2350' some red shale  
 2400' - 2410' Shale, gray, sandy, silty with green tinge  
 2410' - 2420' Silt, sandy, lt gray  
 2420' - 2460' Shale and silt, gray  
 2460' - 2510' Sand, very fn grn, lt gray, shaly  
 2510' - 2540' Shale, dark gray silty and shaly  
 2540' - 2600' Sand, lt gray, silty and shaly  
 2600' - 2622' Sand aa with traces black shale

Fride Shale 2622' (-444')

2622' - 2720' Shale, dark gray to black  
 2720' - 2726' Shale, gray and lt brown silty  
 2726' - 2729' Sand, white, fn grain  
 2729' - 2740' Shale, dark, gry, hard calc. Limestone, dark gray shaly.  
 2740' - 2760' Shale aa, with limestone, gray, hard (some silica cement)  
                   some red shale  
 2760' - 2770' Shale and limestone aa. some red tint in shaly Ls.  
 2770' - 2797' Shale and limestone aa, with increase in red and brown shale

Ravencliff Formation (Princeton) 2797' (-619')

2797' - 2858' Sand, white, fn & med. grn, round and angular, some shale aa  
 2858' - 2930' Shale, gray & dark gray, calc., mica.  
 2930' - 2970' Shale, gray and dark gray, calc., mica., some shale, brown  
                   and Ls, dark gray, shaly

Base Ravencliff Formation 2970' (-792')

2970' - 2990' Shale, gray, red and brown, mica.  
 2990' - 3010' Shale, gray, sandy  
 3010' - 3040' Shale, gray, silty, mica., calc. (some Ls., dense, shaly, red)  
 3040' - 3060' Shale, gray, red & brown, silty, mica., calc.  
 3060' - 3130' Shale, gray, red & green, mica., sandy, calc., some Ls. nodules  
                   (3090' - 3110' is 90% red shale)

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3130' - 3160' Shale, red & gray with 30% to 50% sand, fn grn.  
3160' - 3170' Shale, gray 80% with shale, red, silty, mica.  
3170' - 3200' Shale, gray, silty, sandy (some Ls. nodules)  
3200' - 3210' Shale, aa with some Ls. gray, dense, shaly.  
3210' - 3230' Shale, aa with 20% red shale.  
3230' - 3240' Shale, gray, silty, mica.  
3240' - 3260' Shale, gray, silty, mica with pyrite. Silica & Ls. nodules.  
3260' - 3310' Shale, gray, silty, mica. sandy and calc.  
3310' - 3320' Sand, lt gray, fn grn, some red shale and pyrite  
3320' - 3360' Sand, lt gray, fn grn, silica cement. Some silty mica. shale  
3360' - 3386' Sand, lt gray, fn & med grn, shaly with silica cement

1st Maxton Sand 3386' (-1208')

3386' - 3400' Sand, fn grain, angular and round  
3400' - 3416' Sand, fn & med grain, angular & round with silica cement  
Show gas 3392' to 3412' to maximum 40 units, then gradual  
decline, No Fl, no cut. Trip for new bit 3442'.  
Trip gas to maximum of 600 units.  
3416' - 3430' Sand, white, fn grn and shale gray  
3430' - 3472' Sand, white, fn grn & med. grn with pyrite  
3472' - 3490' Sand aa with silica cement. Some Ls. drk gry shaly  
3490' - 3510' Shale, gray, mica, calc.

Base 1st Maxton 3510' (-1332')

3510' - 3520' Shale, gray to drk gray, mica, calc. Ls., dolomitic, gray 25%  
3520' - 3530' Shale, dark gray, platy  
3530' - 3620' Shale, drk gry, silty, mica, pyrite, calc. (some Ls. nodules)

2nd Maxton 3620' (-1442')

3620' - 3675' Shale, drk gry, silty with interbedded Ls. dark gray, dense,  
shaly

Base 2nd Maxton 3675' (-1497')

3675' - 3710' Shale, drk gry, silty with some red shale mica.  
3710' - 3740' Shale, drk gry, silty mica.  
3740' - 3790' Shale aa with Ls. nodules

3rd Maxton 3790' (-1612')

3790' - 3810' Limestone, gray, foss., (crinoid stems) nodular with shale aa  
3810' - 3846' Limestone, brown, dense, some shale aa.

Base 3rd Maxton 3846' (-1668')

3846' - 3912' Shale, dark, gry.

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Little Lime 3912' (-1734')

3912' - 3930' Limestone, gray to dark gray mottled, coarse xln, but dense  
foss., shaly  
3930' - 3976' Limestone aa with oolites, shaly

Big Lime 3976' (-1798')

3976' - 4100' Limestone, gray to white, gray, mottled, with oolites,  
some chalky Ls. oolites increase with depth.  
4100' - 4190' Limestone, gray to dark gray, dense, fine to coarse xln,  
gradually turning lt. gray.  
Gas show 4178' to 4190'. From 2 units to 50 units,  
then back to 4 units. No. Fl, no cut..  
4190' - 4300' Limestone, lt gray to tan, fn xln, dense, some oolites.  
4300' - 4350' Ls. aa with trace Ls., fn xln, red, some crinoid stems,  
from 4340' - 4350' - some increase in red Ls.  
4350' - 4392' Limestone, gray to lt gray, fn xln, dense, almost lithographic.  
Some Ls. chalky with oolites.

Base Big Lime 4392' (-2214')

4392' - 4610' Shale, with limestone stringers, gray to varicolored,  
mostly red, silty and sandy.

Weir 4610' (-2432')

4610' - 4940' Shale, gray, mica, with silica and pyrite  
4940' - 4950' Shale aa with 2 to 5% sand, fn grn, hard (silica cement)

Berea 4950' (-2772')

At 4977' Booster unit quit -- pop-off valve went off.  
Shut down for repairs. Background gas from 4900' to  
4976' range from 14 to 18 units. At 4977' moved to  
35 units when rig shut down. Break in returns.

4950' - 4990' Shale, dark gray, sandy, silty, mica. with gritty appearance.  
4990' - 5000' Shale, black, abundant mica gives sparkly appearance,  
gritty, some sand, fn grn, hard, gritty.  
5000' - 5104' Shale, gray and black, sandy, mica., gritty, with pyrite.  
At 4999' connection gas is 55 units.  
4999' to 5032' = 14 units  
5032' to 5054' gradual decrease to 6 units  
5054' to 5104' gradual increase to 40 units, then  
to maximum of 52 units.  
5112' = 30 units. 5120' = 20 units. 5140' = 36 units.  
5170' = 30 units. 5178' = 26 units, then gradual  
decrease to 14 units

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Base Berea Top Devonian Shale 5104' (-2926')

5104' - 5140' Shale, gray to black, mica.  
5140' - 5250' Shale, gray, hard  
5250' - 6000' Shale, light and dark gray, mica, some pyrite  
6000' - 6010' Shale, black with coal  
Hole not unloading. Very poor samples  
Gas shows: 5975' to 6004' = 16 units  
Connection gas at 6007' = 450 units  
6010' = 90 units      6012' = 90 units  
6012' to 6020' = 40 units      6020' to 6038' = 30 units  
6038' to 6054' = 22 units      6054' to 6076' = 30 units  
6076' to 6080' = 40 units      6084' = 50 units  
6084' to 6090' = 50 to 60 units

6010' - 6078' Poor samples. Probably shale, black and coal

Onondaga 6078' (-3900')

6078' - 6095' Very fine cuttings. Limestone, light gray to light brown, fn xln, 20% chert, clear and translucent, pyrite and silica cement. Trip for NB at 6095'.  
6095' - 6100' Limestone and chert aa. Trace glauconite.  
6100' - 6140' Limestone, gray and light brown, dense, some shale, green (olivine color), some sand, fn & med. grain rounded and angular. Traces glauconite. Some limestone, med. to coarse xln. Some pyrite.  
6140' - 6160' Dolomite, calc., mottled gray and light gray, medium xln, cherty, glauconitic, traces sand aa  
6160' - 6197' TD Dolomite, mottled, fn & med. xln., sparkly, some yellow color, cherty, pyrite at TD. Some dolomite may be foss. or oolitic.

Driller TD: 6200'

Schlumberger TD: 6197'

ALL DEPTHS CORRECTED TO SCHLUMBERGER MEASUREMENTS.