

Operator: Davis Elkins
 Farm: J. R. Smith, Heirs
 Well No.: 2 (Two)
 Field Name: Early Grove
 Location: Washington County, Virginia
 8,350' South of 36°40'
 7,250' East of 82°20' approximate
 Elevation: 1561.3'
 Total Depth: 5650' (Driller)
 Completed: August 1932
 Result: Dry and Abandoned

Samples examined by
 Warren J. Souder
 Virginia Division of
 Mineral Resources
 July 1965

Geologic Rock Cuttings Log

Samples are available from 2052' to 5500'. Well was drilled with cable tools. Though total depth was 5650', there are no samples available in VDMR sample repository below 5500'. Some samples appear to have been caught at certain specific depths such as 10' and would not necessarily represent sample range such as from an interval of 5' to 10'.

<u>Depth</u>	<u>Thickness</u>	<u>Lithology</u>
2052'	-	<u>Limestone</u> , dull white, gray and red mottled, crystalline, with gray, gray-green and red shale pellets in the matrix, fossiliferous, calcitic, oolitic and with gray, calcareous, clay, shale with fine mica flakes.
2070'	-	<u>Limestone</u> , dark gray and white mottled, medium crystalline, calcitic, fossiliferous and fragmental.
2140'	-	<u>Limestone</u> , dark gray, very argillaceous with a few fossils.
2220'	-	<u>Limestone</u> , gray, very argillaceous, platy.
2398'	-	<u>Limestone</u> , dark gray, medium crystalline, calcarenitic, slightly glauconitic.
2465'	-	<u>Limestone</u> , light gray, light brown-white, calcitic, slightly glauconitic.

2530'	-		<u>Limestone</u> , light gray-brown, medium crystalline, fragmental, few oolites.
2610'	-		<u>Limestone</u> , light gray-brown, medium to fine crystalline.
2622'	-		<u>Limestone</u> , gray-brown, finely crystalline, calcitic, few fossil fragments (cement in sample).
2633'	-		<u>Limestone</u> , light gray-brown, crystalline, few fossil fragments.
2645'	-		<u>Limestone</u> , gray-brown, dull white mottled, medium coarse crystalline, fossil fragments.
2675'	-		<u>Limestone</u> , gray-brown, medium crystalline, calcitic with traces of gray-green shale.
			(Note: From 2685' to 5500' the samples are of 5' to 10' intervals, more or less.)
2675'-2720'	45'		<u>Limestone</u> , dark gray with some dull white, argillaceous, few fossil fragments.
2720'-2766'	46'		<u>Limestone</u> , gray to dull white mottled, medium to coarse crystalline, fragmental, fossil fragments, few pieces of reddish limestone, trace of light brown chert. • 2745'-2766' - with dark brown oolites.
2766'-2782'	16'		<u>Limestone</u> , gray, medium crystalline, calcarenitic, slightly siliceous, trace of brown chert.
2782'-2790'	8'		<u>Limestone</u> , dark gray, black, medium to fine crystalline, argillaceous with white to opaque anhydrite. (Good show of anhydrite).
2790'-2817'	27'		<u>Limestone</u> , gray to dull white, mottled, medium crystalline, calcarenitic, few oolites, trace of glauconite, slightly siliceous, trace of brown chert.

VDMR Well No: 83

2805'-2817' - the limestone is coarser crystalline and more fragmental.

2817'-2840' 23' Limestone, gray, medium fine to fine crystalline, slightly argillaceous, slightly calcarenitic.

2840'-2863' 23' Limestone, gray, dull white mottled, brownish tinted, medium to coarse crystalline, fragmental, fossil fragments, some large oolites, trace smoky chert.

2840'-2856' - with several, clear, well formed calcite crystals.

2863'-2924' 61' Limestone, dark gray, medium to fine crystalline, argillaceous, somewhat fragmental, few fossils.

2876'-2882' - with traces of brown chert.

2918'-2924' - with traces of calcite crystals.

2924'-2930' 6' Limestone, gray, light gray, dull white mottled, coarse crystalline, fragmental, traces of light brown chert.

2930'-2938' 8' Shale, clay, black, thin bedded, very fine mica flakes, slightly slickensided, greasy in appearance.

2938'-2961' 23' Limestone, gray, dull white mottled, coarse crystalline, fragmental, calcitic with black, clay, shale.

2956'-2961' - with a trace of brown chert.

2961'-2972' 11' Limestone, dark gray to dull white, brownish tinted, argillaceous, with traces of clear calcite crystals.

2972'-2992' 20' Limestone, light gray, dull white, brownish tinted, medium crystalline, fragmental, brown oolites, calcitic.

2983'-2992' - with traces of brown chert.

VDMR Well No: 83

2992'-3022'	30'	<u>Limestone</u> , dark gray and light gray mottled, medium crystalline, slightly siliceous with considerable brown and black chert. 3016'-3022' - with less chert.
3022'-3067'	45'	<u>Limestone</u> , gray-brown, medium fine crystalline with small pieces of calcite. (Note: Samples are finely ground up.)
3067'-3075'	8'	<u>Shale</u> , gray, clay, calcareous, soft.
3075'-3081'	6'	<u>Limestone</u> , gray-brown, finely crystalline, with small pieces of calcite. (Note: Samples are finely ground up.)
3081'-3106'	25'	<u>Shale</u> , dark gray-black, clay, calcareous, very fine mica flakes, very thin calcite veining, soft. 3100'-3106' - with some light gray, very argillaceous limestone which grades to mudstone.
3106'-3155'	49'	<u>Limestone</u> , dark gray-black, fairly argillaceous, grading to light gray argillaceous mudstone. 3132'-3138' - with gray-brown and light gray argillaceous, slightly siliceous limestone. 3150'-3155' - slightly siliceous, and a trace of brown chert.
3155'-3168'	13'	<u>Limestone</u> , dark gray-brown, finely crystalline, slightly argillaceous, calcite veining. (Note: Finely ground up samples)
3168'-3210'	42'	No Samples

VDMR Well No: 83

3210'-3254'	44'	<p><u>Limestone</u>, dark gray-brown, finely crystalline, slightly argillaceous, with some light gray, argillaceous limestone, with fine calcite crystals (finely ground up samples)</p> <p>(Note: 3155'-3254' is possibly the same lithologic unit.)</p>
3254'-3356'	102'	<p><u>Limestone</u>, dark gray and light gray with some mottling, finely crystalline, argillaceous, slightly fragmental, few thin calcite veins and calcite crystals.</p> <p>3266'-3280' - with dark gray chert.</p> <p>3306'-3356' - with less light gray limestone.</p> <p>3325'-3331' - with an increase in argillaceous, dark gray limestone.</p> <p>3349'-3356' - with an increase in argillaceous materials.</p>
3356'-3360'	4'	<p><u>Limestone</u>, gray-brown, finely crystalline, argillaceous, and light gray argillaceous limestone, which grades to mudstone.</p>
3360'-3414'	54'	<p><u>Shale</u>, black, clay, thin bedded, calcareous, very fine mica flakes, few very thin calcite veins.</p> <p>3363'-3369' - with some slickensidedness with the shale greasy in appearance, carbonaceous.</p> <p>3363'-3386' - with some sulphurous coatings on the shale.</p> <p>3380'-3386' - with much calcite and calcite veining.</p> <p>3386'-3392' - with gray, light gray mottled, medium crystalline slightly calcarenitic, limestone.</p> <p>3392'-3408' - with small amount of anhydrite.</p>

3414'-3426'	12'	<u>Limestone</u> , dark gray, finely crystalline, argillaceous and light gray argillaceous limestone with some calcite crystals.
3426'-3633'	207'	<u>Shale</u> , dark gray, clay, slightly calcareous, with calcite veining and a few fossils inside the shale as inclusions.
		3435'-3442' - with a thin gray to light gray, finely crystalline, argillaceous, slightly siliceous limestone.
		3472'-3480' - with dull white-gray, crystalline medium grained calcarenitic limestone with pyrite inclusions.
		3486'-3494' - no samples
		3494'-3500' - with considerable fine grained mica flakes and hard siliceous, calcareous, gray shale.
		3524'-3541' - with interbedded light gray and black, medium crystalline fragmental argillaceous limestone.
		3547'-3553' - with calcarenitic, light gray, slightly siliceous limestone.
		3556'-3568' - with an increase in calcareous content; with light gray, calcarenitic, argillaceous, limestone and coarse crystalline, black, argillaceous limestone.
		3586'-3592' - with dark gray, argillaceous, fossiliferous limestone.
		3598'-3606' - with dark gray, black, medium coarse crystalline, fossiliferous, argillaceous limestone and some light gray, very argillaceous, mudstone, limestone.
		3606'-3625' - with a few fossil fragments.
		3625'-3633' - with a trace of anhydrite.

3633'-3663'	30'	<p><u>Limestone</u>, dark gray, dull white mottled, medium crystalline, argillaceous, fossil fragments.</p> <p>3639'-3640' - with dark brown, smoky to black chert, many calcite crystals.</p> <p>3657'-3663' - with an increase in argillaceous content. (Samples are finely ground up.)</p>
3663'-3670'	7'	<p><u>Limestone</u>, gray, finely crystalline, dense, argillaceous, slightly siliceous.</p>
3670'-3716'	46'	<p><u>Limestone</u>, black, finely crystalline, very argillaceous.</p> <p>3670'-3682' - with many calcite crystals.</p> <p>3688'-3716' - this interval is almost a shale.</p> <p>3688'-3694' - with a trace of reddish-brown shale.</p> <p>3694'-3700' - with considerable anhydrite.</p> <p>3712'-3716' - with small, black, colites, and a trace of anhydrite.</p>
3716'-3733'	17'	<p><u>Shale</u>, dark gray, clay, calcareous, soft.</p> <p>3727'-3733' - with considerable anhydrite.</p>
3733'-3739'	6'	<p><u>Limestone</u>, gray, finely crystalline, fair dolomitization, trace anhydrite.</p>
3739'-4028'	289'	<p>Shale, gray, clay, with variable amounts of gray-green and reddish brown shale, calcareous, with interbedded thin limestones and anhydrite, often fossiliferous.</p> <p>3762'-3766' - with considerable anhydrite.</p>

VDMR Well No: 83

3766'-3772' - with gray-brown, finely crystalline, dense, argillaceous, limestone.

3778'-3784' - with gray to dull white and red mixed, granular, calcarenitic, with fine mica flakes, limestone.

3794'-3796' - with considerable anhydrite.

3802'-3810' - with some reddish-brown, calcareous shale.

3810'-3824' - with considerable anhydrite.

3830'-3846' - slightly siliceous shale.

3846'-3852' - with calcite crystals in veins.

3852'-3860' - with reddish-brown, argillaceous, calcarenitic limestone.

3860'-3866' - with light gray, argillaceous, calcarenitic limestone.

3866'-3874' - with anhydrite.

3874'-3882' - with much anhydrite.

3882'-3900' - with reddish brown, calcareous shale and anhydrite.

3911'-3914' - with calcite crystals in veins.

3914'-3922' - with anhydrite.

3922'-3928' - with gray argillaceous, calcarenitic, limestone.

3928'-3956' - with much anhydrite.

3938'-3946' - with black, very calcareous, shale.

3965'-3972' - with gray with brownish tints, finely crystalline, argillaceous, dense, limestone.

3972'-3984' - with considerable anhydrite.

3984'-3996' - with black, calcareous shale and anhydrite.

3998'-4006' - with gray, medium fine, sand, impregnated with a few anhydrite crystals and a few grains of glauconite.

4006'-4012' - with dark gray-green calcareous shale, and dark gray, reddish-brown tinted, finely crystalline, argillaceous limestone.

4012'-4028' - with dull reddish, calcareous shale and some light gray-green, calcareous, shale.

4028'-4128'

100'

Sandstone, white with discolorations from black to red to gray-green, ranging from coarse, frosty to fine, very fine to silt grained with occasional shale breaks of gray-green and reddish shales.

4028'-4034' - with considerable dull reddish shale.

4035'-4040' - with black, clay thin bedded shale."

4040'-4046' - with coarser grained, reddish stained sandstone.

4046'-4052' - with gray, gray-green, reddish, calcareous, soft shale and gray-green, fine grained sandstone and siltstone.

4052'-4100' - the sandstone is fine to very fine grained, with some silt and is gray, to gray-green with some reddish tints.

VDMR Well No: 83

4100'-4106' - with considerable gray, siliceous, splintery, fine mica flakes, hard, clay, shale.

4012'-4018' - with reddish and gray-green tints.

4128'-4150'	22'	<u>Shale</u> , gray, clay, siliceous, fine mica flakes, hard, with occasional gray to gray-green shale and interbedded reddish silt.
4150'-4192'	42'	<u>Sandstone</u> , dull white with greenish tints and a few red grains, medium to fine grained, with fine mica flakes and dark gray, siliceous, shales interbedded in basal two thirds. 4160'-4192' - with interbedded dark gray, siliceous shale.
4192'-4200'	8'	<u>Shale</u> , gray to dull reddish brown, siliceous, silty, with fine mica flakes.
4200'-4212'	12'	<u>Siltstone</u> , gray-green, dull reddish with dark gray siliceous shale.
4212'-4248'	36'	<u>Sandstone</u> , gray to light gray with gray-green tints, very fine grained, slightly argillaceous with fine mica flakes. 4224'-4236' - with dull white, very fine grained sandstone with few small glauconite grains.
4248'-4272'	24'	<u>Siltstone</u> , dark gray-green, argillaceous, fairly dark green glauconitic. 4266'-4272' - very glauconitic and black until crushed, trace of anhydrite.
4272'-4360'	88'	<u>Shale</u> , dark gray, clay, fine mica flakes, siliceous, silty. 4278'-4284' - with dull reddish brown, slightly glauconitic, silty, shale. 4284'-4296' - with light gray, very fine sand, argillaceous, slightly glauconitic.

VDMR Well No: 83

4296'-4300' - with dull rusty shale.

4306'-4318' - with dull white and dull rusty silt.

4330'-4340' - with dull reddish brown shale; some silt.

4350'-4360' - with light gray and rusty red silts and glauconite.

4360'-4390'	30'	<u>Sandstone</u> , dull light gray-brown-rusty, very fine grained, slightly calcareous with silts and dark gray, siliceous, clay shale.
4390'-4460'	70'	<u>Shale</u> , gray, clay, some rusty red shale, fine mica flakes, moderately soft.
		4404'-4410' - with silt
		4416'-4422' - with dark red shale, a few large sand grains and golden mica flakes.
		4455'-4460' - with dull red shale, silty.
4460'-4470'	10'	<u>Sandstone</u> , dull white, greenish tinted, very fine grained, silty very slightly calcareous, dense, with interbedded rusty and gray shale.
4470'-4540'	70'	<u>Shale</u> , gray, clay, fine mica flakes, slightly siliceous with some rusty shale.
		4476'-4484' - with light gray silt.
		4496'-4540' - with gray silts and a few pieces of rusty shale.
4540'-4752'	212'	<u>Shale</u> , dark gray, clay, with some dark red shale.

VDMR Well No: 83

4570'-4584' - with a trace of glauconite.

4693'-4752' - with a slight amount of gray silt.

4744'-4752' - with some reddish silt.

4752'-4780' 28'

Sandstone, white to dull white, pebbles to fine grained, some grains frosted and sub-rounded, large pebbles are broken into sharp pieces, conglomeritic, finer sand mixed throughout, with some dark gray shale.

4780'-4840' 60'

Shale, dark gray, clay, siliceous, some gray reddish tinted silt.

4790'-4805' - with very fine sand.

4805'-4812' - with considerable reddish-brown, silty shale.

4825'-4831' - with considerable reddish-brown, silty shale.

4840'-5500' 660'

Shale, dark gray, clay, fairly soft.

4908'-4918' - with a trace of pyrite.

5008'-5038' - with a few pieces of dark reddish shale.

5132'-5150' - with a very few pieces of dark red shale.

5260'-5310' - with a very few pieces of dark red shale.

5400'-5420' - with some dark red and rusty shale.

5470'-5480' - no samples

Note: Well was drilled to 5650'. No samples are available below 5500' in VDMR sample repository.