

Bull Creek Coal Land Company No. 13 (500) Well

Peytona District, Boone County, W. Va.

By the Owens, Libbey-Owens Gas Department, Box 1375, Charleston, W. Va.

Located 3.94 mi. W. of 81°35' and 2.22 mi. S. of 38°15' -NC- Peytona Quadrangle;

3 mi. W. of Hernshaw on Road Fork of Bull Creek.

Elevation, 979' L.

Permit, Boo-402

Drilling commenced Dec. 12, 1937, completed, August 11, 1939.

Casing, 16", 31'; 13", 244'; 10", 1247'; 8 1/4", 1496' (pulled); 6-5/8", 4500';

2" tubing, 6004'.

Shot with 72 quarts of nitroglycerin from 5244 to 5264', 30 quarts from 5922 to 5941'

and 30 quarts from 5988 to 5998'; 15 minutes after shot, gauged 261,000 cubic

feet per day from the gas pays at these depths; after tubing on August 11, 1939

well gauged 169,000 cubic feet per day, not including 246,000 cubic feet from

the Big Lime.

Rock pressure, 1955 lbs. in 120 hours.

This is the first well in West Virginia to obtain gas production from the White Medina or Albion Sandstone, corresponding to the "Clinton Sand" of Ohio.

According to the geologic map<sup>1</sup> of Boone County the well starts about 470 feet

1

Krebs, C. E. and Teets, D. D., Jr.; Geologic Map of Boone County, West Virginia Geological Survey, 1914.

below the top of the Pottsville, making the total thickness of the Pottsville

1554 feet at this locality. Down to the top of the Huntersville Chert, the section

is based on the drillers' record with formation names as given by Robert C.

Lafferty of The Owens, Libbey-Owens Gas Department. Below the top of the Huntersville

Chert the section is based on a complete set of samples.

Top	Bottom	Thickness	
			<u>Pottsville Formation, 1084 feet</u>
0	24	24	Clay
24	30	6	Gravel
30	73	43	Slate, dark
73	90	17	Sand, white
90	92	2	Coal (Cedar Grove)
92	151	59	Sand, white (hole full of fresh water at 97')

Top	Bottom	Thickness	
151	172	21	Lime, white (Probably sandstone)
172	194	22	Slate, dark
194	196	2	Coal (Campbells Creek No. 2 Gas)
196	205	9	Slate, dark
205	255	50	Sand, white
255	290	35	Slate, dark
290	363	73	Sand, white (Nuttall Sandstone)
363	365	2	Slate, dark
365	396	31	Sand, white
396	436	40	Slate, dark
436	758	322	Sand, white (First Salt Sand; water at 630', 5 bailers per hour)
758	761	3	Slate, black
761	941	180	Sand, white (Second Salt Sand; at 826' salt water rose to depth of 900')
941	949	8	Slate, white
949	1031	82	Lime, dark (probably sandstone)
1031	1084	53	Sand, white (Third Salt Sand)
			<u>Mauch Chunk Group, 163 feet</u>
1084	1086	2	Shale, red
1086	1108	22	Sandy, lime, dark (probably sandstone)
1108	1125	17	Lime shells, dark (probably shaly sandstone)
1125	1128	3	Shale, red
1128	1167	39	Slate and shells, dark
1167	1171	4	Slate, dark
1171	1176	5	Lime, dark
1176	1185	9	Sand
1185	1203	18	Slate, dark
1203	1247	44	Lime, dark (perhaps Glenray Limestone)
			<u>Greenbrier Limestone, 186 feet</u>
1247	1258	11	Lime, white
1258	1265	7	Lime, dark
1265	1293	28	Lime, white
1293	1305	12	Lime, dark
1305	1433	128	Lime, white (gas at 1398'; gas at 1405', 403,000 cu. ft.; gas at 1417', 243,000 cu. ft.)

Top	Bottom	Thickness	
<u>Maocrady Formation, 58 feet</u>			
1433	1491	58	Sand, red (gas at 1439', 239,000 cu. ft.; gas at 1450', 249,000 cu. ft.)
<u>Pocono Formation, 417 feet</u>			
1491	1511	20	Lime shells, dark, hard
1511	1526	15	Slate, white
1526	1557	31	Slate, and shells, light
1557	1571	14	Shells, light
1571	1886	315	Slate and shells
1886	1901	15	Shale, "coffee" brown (Sunbury Shale)
1901	1908	7	Sand, dark (Berea Sandstone)
<u>Devonian Shales, 2570 feet</u>			
1908	1935	27	Slate and shells
1935	1987	52	Shells, light
1987	2056	69	Slate and shells, light
2056	2159	103	Slate and shells, dark
2159	3104	945	Slate, light
3104	3139	35	Shale, brown
3139	3210	71	Slate and shells, dark
3210	3225	15	Shells, dark
3225	3230	5	Slate, dark
3230	3357	127	Slate and shells
3357	3397	40	Shale, brown
3397	3417	20	Slate and shells, light
3417	3480	63	Slate and shells, dark
3480	3702	222	Shale, brown
3702	4102	400	Slate, white ("Big White")
4102	4478	376	Shale, brown
<u>Huntersville Chert, 97 feet</u>			
4478	4484	6	Limestone, brown, very cherty
4484	4516	32	Chert and very cherty limestone, brown and light-gray
4516	4518	2	Chert, gray and brown, highly calcareous, silty; contains a little glauconite
4518	4528	10	Chert, brownish-gray, highly calcareous
4528	4555	27	Chert, brown to gray, highly calcareous, silty; contains a little glauconite; most of this interval could just as well

Top Bottom Thickness

be called silty and cherty limestone, as chert; about a foot at the bottom is more highly glauconitic and contains some rounded sand grains

4555	4557	2	Sandstone, brownish-gray, fine, calcareous; contains a little glauconite
4557	4562	5	Chert, gray to light-brown, highly calcareous
4562	4573	11	Sandstone, brownish-gray, very fine (almost a siltstone), cherty and calcareous; contains some glauconite and dolomite
4573	4575	2	Sandstone, dark-gray, cherty, dolomitic, glauconitic; some of sand is coarser and more rounded than in sandstone above and glauconite is more abundant and in larger grains; also contains more pyrite
<u>Oriskany Sandstone, 16 feet</u>			
4575	4584	9	Sandstone, light yellowish gray, medium-grained, calcareous; many of grains fairly well rounded
4584	4591	7	Sandstone, light yellowish gray, medium-grained; highly calcareous; breaks more in chips than the sandstone <sup>above</sup>
<u>Helderberg Group, 162 feet</u>			
4591	4606	15	Limestone, gray to light-brown, very cherty; contains large amounts of light-gray translucent chert
4606	4641	35	Limestone, dark-brown (gray when dry), shaly, dolomitic; residue from acid treatment is about as large as portion taken for treatment but fragments become very porous; residue seems to be mostly silt, with some pyrite and a little gray chert; little glauconite from 4637 to 4641'
4641	4660	19	Chert, gray, highly calcareous, sandy; contains a little glauconite and dolomite and much silt and very fine sand
4660	4681	21	Chert, gray, sandy, calcareous; and very cherty calcareous sandstone; contains a little glauconite throughout and in bottom half, considerable pyrite; both this interval and the one next above have somewhere nearly equal parts of chalcedony, fine detrital quartz and calcite
4681	4689	8	Chert, gray to brown, silty, highly calcareous; contains a little glauconite

Top	Bottom	Thickness	
4689	4709	20	Limestone, dark-gray, fossiliferous; large insoluble residue of dark-brown porous masses containing much pyrite
4709	4753	44	Limestone, dark-gray and brownish, with some white to light-gray; contains many shell fragments; insoluble residues smaller than from last interval, contain some fine sand and porous pyritic masses similar to those from the interval above but less coherent
<u>Salina Formation, etc., 694 feet</u>			
4753	4766	13	Limestone, dark-brown, very fine textured, slightly dolomitic, shaly; very small insoluble residue containing pyrite, very small quartz crystals and from 4753 to 4757' a little brown chert; acid with which samples have been treated has dark-brown material in suspension
4766	4777	11	Dolomite, brown; more crystalline in appearance than the limestone above, but still very fine textured
4777	4796	19	Limestone, dark-brown (nearly black when dry), shaly, somewhat dolomitic; dark-brown material in suspension in acid after treating samples
4796	4804	8	Limestone, brown, somewhat dolomitic; contains considerable white anhydrite and a few small quartz crystals
4804	4829	25	Dolomite and dolomitic limestone; dark-brown, shaly; contains a little anhydrite and a very little gray chert
4829	4857	28	Dolomite-anhydrite rock; dark-brown, very fine textured dolomite and coarser, white, anhydrite
4857	4875	18	Dolomite, light-brown, fine granular
4875	4885	10	Dolomite, dark-brown, shaly
4885	4909	24	Limestone, dark-brown, shaly, slightly dolomitic, very fine textured
4909	5046	137	Dolomite-anhydrite rock, dark-brown to medium-brown; anhydrite is generally much subordinate to dolomite in amount and lighter in color; much of this rock has a shaly structure but there is little or no real shale in this interval; has very fine texture and much of it does not even appear crystalline under low power binocular; sample from 5021 to 5025' shows some round objects which are

Top Bottom Thickness

probably oolites whose structure is destroyed by replacement by dolomite; some nearly black, pyritic, shaly fragments from 5041 to 5046'

5046	5055	9	Dolomite, brown, finely crystalline
5055	5105	50	Dolomite, dark-brown, with small to moderate amounts of anhydrite; mostly a little finer textured than 5046 to 5055'
5105	5155	50	Dolomite, dark-brown to gray, finely crystalline (a little gas at 5109'; at 5133 to 5136', 3 gallons per hour of salty sulphur water)
5155	5159	4	Anhydrite, gray to white, with considerable dolomite
5159	5163	4	Dolomite, brown, 60%; sandstone, brown, white and light-green, 40%; there seems to be a gradation from sandy dolomite into dolomitic sandstone; some of sand grains are rounded and frosted
5163	5172	9	Dolomite, light-brown, very finely crystalline
5172	5176	4	Dolomite dark-brown, very fine
5176	5224	48	Dolomite, medium- to dark-brown, fine to very fine textured; a little anhydrite in some samples
5224	5243	19	Dolomite, dark-brown, fine; contains a little anhydrite and silt
5243	5263	20	Sandstone, white to light-gray with some yellow stain; fine to very fine with some of larger grains well rounded; cement is partly quartz and partly dolomite with more dolomite toward the top and bottom; some gray, partly sandy dolomite between 5257 and 5263', so base of sand may be higher than 5263' (gas at 5248 to 5260'; 31,000 cu. ft. per day at 5254' and 65,000 cu. ft. per day at 5260')
5263	5264	1	Dolomite, gray, very sandy
5264	5267	3	Dolomite, brown and gray, very fine textured; contains some indistinct oolites and a little sand
5267	5270	3	Sandstone, light-gray, fine, 60%; gray to brown dolomite, 40%
5270	5276	6	Dolomite, gray and brown, sandy and shaly; a few fragments of grayish-green shale
5276	5280	4	Dolomite, dark-brown, fine

Top	Bottom	Thickness	
5280	5286	6	Dolomite-anhydrite rock, gray, with a little rounded sand (sulphur water from 5133 to 5136' tested 17 gals. in 24 hrs.)
5286	5317	31	Dolomite, dark-brown, shaly; some small oolites from 5302 to 5309'
5317	5319	2	Dolomite, brown, 70%; greenish-gray shale, 30%
5319	5326	7	Shale, black, dolomitic
5326	5353	27	Dolomite, dark-brown, shaly; contains some silt or very fine sand; a little black shale between 5348 and 5353'
5353	5381	28	Dolomite, brown, finely crystalline, with a few scattered larger crystals; contains a little anhydrite; considerable very fine sand and pyrite from 5367 to 5381'
5381	5394	13	Dolomite, brown, finely crystalline; contains small to moderate amount of sand, with larger grains well rounded and frosted
5394	5403	9	Dolomite, brown, finely crystalline, with small amount of chert
5403	5409	6	Limestone, brownish-gray, fossiliferous, somewhat dolomitic; contains a little chert
5409	5420	11	Limestone, dark-brown, very fine textured, indistinctly oolitic; slightly dolomitic, a little sand and anhydrite from 5416 to 5420'; brown organic matter in suspension after acid treatment
5420	5435	15	Limestone, brown, with some nearly white, finely crystalline; slightly dolomitic; contains a little anhydrite from 5420 to 5427' and a few very small quartz crystals from 5427 to 5432'
5435	5438	3	Dolomite, brown; with a little anhydrite and white to light- green very fine sandstone
5438	5447	9	Limestone, light-brown, fossiliferous; contains much pyrite and some fine sand and dolomite

Top Bottom Thickness

Clinton Formation, 428 feet

5447	5457	10	Sandstone, gray, fine, calcareous, dolomitic, pyritic; larger sand grains are rounded and frosted; cement is calcite, dolomite, and probably some quartz; a little dark-gray shale between 5451-5454'
5457	5464	7	Sandstone, gray, mostly fine to very fine but not well sorted; somewhat dolomitic, but contains less of carbonates than the sandstone above and is nearly a quartzite; much pyrite in some fragments
5464	5466	2	Sandstone, dark-gray to brownish, dolomitic; mostly fine but poorly sorted; larger grains are rounded and frosted
5466	5468	2	Shale, dark-gray, silty, dolomitic
5468	5476	8	Sandstone, gray, very fine, dolomitic; some fragments dark and shaly and some lighter, almost like quartzite
5476	5487	11	Sandstone, to light-gray, slightly dolomitic, fine to very very fine; cement is mostly silica and much of the rock is practically a quartzite
5487	5490	3	Shale, gray
5490	5496	6	Shale, red, 50%; gray shale, 50%
5496	5502	6	Shale, gray (sample contains no red shale at all, so it probably belongs in place of the last which is most likely interchanged with it)
5502	5623	121	Shale, red, non-calcareous, distinctly laminated and very fine textured; the color is somewhat more grayish toward bottom of this interval
5623	5645	22	Shale, about 50 to 60% red and 50 to 40% grayish-green; perhaps some of the red shale is wavings
5645	5665	20	Shale, about 60% grayish-green and 40% grayish-red
5665	5697	32	Shale, grayish-red; with some grayish-green and some nearly neutral-gray
5697	5713	16	Shale, grayish-red; with small amount of green shale and a very little glauconitic siltstone
5713	5719	6	Shale, grayish-red with some green; a very few fragments of hematite



Top	Bottom	Thickness	
5819	5827	8	Hematite, fossil ore, partly oolitic, 10%; grayish-red and green shale, 60%; gray to green dolomitic siltstone, 20%; white dolomite with some red spots of hematite, 10%
5727	5783	56	Shale, grayish-red; with small amounts of gray to green shale and siltstone
5785	5799	16	Shale, grayish-red, 60%; green dolomitic siltstone, 30%; green shale up to about 10%
5799	5811	12	Siltstone, gray to green, slightly dolomitic, with up to 30 or 40% of grayish-red shale, perhaps mostly cavings
5811	5819	8	Shale, dark-gray
5819	5833	14	Sandstone, gray to grayish-green, very fine, dolomitic; about 20% of gray to green shale
5833	5842	9	Shale, gray, 80%; dolomitic siltstone and dolomite, 20%
5842	5852	10	Hematite, fossil ore, 5%; grayish-green shale, 85%; light-gray dolomite and dolomitic siltstone, 10%
5852	5875	23	Shale, grayish-green, 80%; green siltstone, 20%; a few large rounded and frosted sand grains
<u>Albion Sandstone, etc. (White Medina), 124 feet</u>			
5875	5883	8	Shale, gray to green, 70%; light-green to white, fine quartzitic sandstone, 20%; green siltstone, 10%; probably most of the shale in this interval is cavings
5883	5888	5	Sandstone, white to light-green, fine, quartzitic, 90%; light-green shale, 10%
5888	5893	5	Sandstone, white, fine, quartzitic; small amount of light-gray and light-green shale
5893	5902	9	Sandstone, white, fine, quartzitic; some samples stained by iron rust from drill steel; contains slight traces of dolomite
5902	5935	33	Sandstone, white, medium-to fine grained, quartzitic; grain structure is a little more apparent than in the sandstone above; small amount of black shale between 5922 and 5923' (when well had reached 5910' gas from 5248 to 5260' tested 50,000 cu. ft. per day; gas at 5929 to 5932½', 72,000 cu. ft. per day)

Top	Bottom	Thickness	
5935	5937	2	Sandstone, white, fine, quartzitic, 80%; gray shale, 20%
5937	5943	6	Sandstone, white with considerable rust stain, fine, very hard (gas at 5940 to 5940 $\frac{1}{2}$ '; 73,000 cu. ft. per day)
5943	5985	42	Shale, gray, 70%; gray to green siltstone 20%; up to 10% of light brown granular dolomite which apparently occurs as veins in the shale
5990			Depth corrected from 5985 to 5990' by SLM
5990	5999	9	Sandstone, gray, very hard; mostly fine but is poorly sorted and contains some large rounded grains; contains large amounts of gray shale, probably from above, except in samples from 5996 to 5999' which contains some green shale (gas at 5992 to 5994', 74,000 cu. ft. per day)
			<u>Queenston Shale, 5+ feet</u>
5999	6004	5	Shale, red, very silty, micaceous
	6004		Total depth