

JUN 17 1954

J. E. HANIFAN et al No. 1

By Washington Natural Gas Co., 217 Washington Ave., Clarksburg, W. Va.
Middle Fork District, Randolph County, W. Va.

Located 1.76 mi. S of 38° 50' and .31 mi. W. of 80° 05'.

SC - Sage Quadrangle.

Elevation 2904 L.

Permit Ran-21

Drilling commenced Sept. 17, 1953; completed Dec. 17, 1953.

Fresh Water - 80 feet.

Gas well - 225,000 cu. ft.

Casing 10" 574'; 8-1/4" 1465'; 6-5/8 - 2274' (left in well).

Coal at 278' and 710'.

Section based on samples from 0' to 250' examined by Russell R. Flowers.

<u>Top</u>	<u>Bottom</u>	<u>Thickness</u>	
0	10	10	Conglomerate, white to very light gray, medium grained to pebbly
10	88	78	Sandstone, light gray, fine to medium grained with many coarse grains, argillaceous, contains some carbonaceous specks and streaks, small amount of chlorite and mica
88	100	12	Shale, dark gray to grayish black, some dark yellowish brown (highly sideritic)
100	113	13	Shale, dark gray, soft, some grayish black, carbonaceous --- Coal Zone?
113	125	12	Sandstone, very light gray, fine grained, some medium to very coarse grains, somewhat argillaceous; a large amount of dark gray, very silty, sideritic shale at the bottom
125	135	10	Shale, dark gray with black (carbonaceous) streak, small amount of dark yellowish brown to dark gray (sideritic) shale
135	145	10	Sandstone, medium gray, with dark yellowish brown specks of siderite, very silty, with some siltstone, micaceous, some carbonaceous material
145	166	21	Shale, dark gray, some grayish black, contains carbonaceous streak; small amount of grayish black to black, highly carbonaceous shale
166	182	16	Siltstone, dark gray, very shaly, somewhat carbonaceous and micaceous
182	198	16	Fireclay, dark gray with brownish cast, soft, highly sideritic (spherules and nodules); some grayish black, somewhat carbonaceous shale
198	222	24	Shale, grayish black, very silty, carbonaceous, some calcified fossil fragments; small amount of black, highly carbonaceous shale to coal; some dark gray siltstone
222	240	18	Shale, dark gray, very silty; some grayish black to black, carbonaceous shale
240	250	10	Siltstone, dark gray, very shaly, somewhat sideritic

250	260	10	Siltstone, dark gray, shaly to sandstone, medium to medium dark gray, very fine, silty; small amount of dark yellowish brown, shaly and silty siderite
260	272	12	Sandstone, light gray, fine grained, very fine to fine, and sideritic at the top, fine to coarse at the bottom, subangular to subrounded
272	275	3	Shale, dark gray with carbonaceous streak
275	287	12	Fireclay, medium to medium dark gray, highly sideritic (spherules and nodules); some dark gray shale with carbonaceous streak; small amount of grayish black to black, highly carbonaceous shale
287	293	6	Shale, grayish black, very silty; some black, highly carbonaceous shale to coal
293	300	7	Siltstone, medium dark gray to shale, dark gray, very silty, somewhat sideritic
300	320	20	Shale, dark gray, silty, some dark yellowish brown to dusky yellowish brown (sideritic)
320	330	10	Siltstone, medium to medium dark gray interbedded with mica, carbonaceous, silty, dark gray to grayish black shale
330	338	8	Shale, grayish black, silty, somewhat carbonaceous; small amount of black highly carbonaceous shale; fireclay, medium gray, sideritic (the large part of this sample is fireclay)
338	340	2	Fireclay, medium to medium dark gray, highly sideritic (spherules and nodules); a very small amount of grayish black to black, highly carbonaceous shale
340	350	10	Fireclay to shale, medium to medium dark gray, sideritic; a large amount of very fine grained, medium gray, sideritic sandstone
350	362	12	Sandstone, medium gray to brownish gray (sideritic), some carbonaceous streaks interbedded with some dark gray to grayish black, silty shale
362	366	4	Coal; fireclay, medium gray to olive gray, somewhat sideritic; some dark gray shale
366	375	9	Shale, dark gray, some dusky yellowish brown, (sideritic), very silty
375	380	5	Sandstone, medium light gray to light olive gray, sideritic, very silty <i>fine grained, silty</i>
380	423	43	Sandstone, light gray to medium gray and light olive gray (sideritic), contains many shaly and silty streaks, and some carbonaceous streaks in the lower part, micaceous, kaolinitic, somewhat chloritic, very fine grained in the upper part, and fine grained to very fine grained to fine grained in the lower part

423	445	22	Siltstone to sandstone, medium to medium dark gray and olive gray, some is very fine, sideritic, micaceous, kaolinitic, some shale streaks and a moderate amount of dark gray to grayish black shale in the lower part
445	455	10	<i>Siltstone to very fine sandstone, medium to medium dark gray and olive gray (shaly) interbedded with dark gray shale; a little dark yellowish brown, shaly siltstone</i>
465	490	45	Fireclay, light olive gray to olive gray, sideritic, interbedded with a moderate amount of dark gray shale and a trace of black (highly carbonaceous) shale at the top
490	500	10	Shale, dark gray to grayish black, silty; some, dusky brown to dark yellowish brown, highly sideritic shale
500	510	10	Siltstone to very fine sandstone, brownish gray, highly calcareous, contains black carbonaceous streaks, interbedded with grayish black (carbonaceous, silty) shale at top and a dark gray shale at the bottom
510	520	10	Shale, dark gray to grayish black; small amount of olive grayish black to black, highly carbonaceous shale; fireclay, olive gray
520	530	10	Siltstone, medium dark gray to olive gray, sideritic, with black (carbonaceous) and dark gray (shaly) streak, micaceous
530	555	23	Siltstone, dark gray, very shaly to shale, grayish black, silty, micaceous
555	579	26	Sandstone, brownish gray, very fine grained, calcareous with carbonaceous streak, interbedded with dark gray to grayish black shale and silty shale
579	589	16	Sandstone, white to very light gray, medium to coarse grained, some very coarse grains to granules in the lower part, subangular to subrounded; some brownish gray to dark yellowish brown, sideritic siltstone to very fine sandstone at the bottom
589	614	25	Siltstone to very fine grained sandstone, light to medium gray
614	636	22	Sandstone, very light to light gray, very fine grained at the top to very fine to fine grained in the middle and lower part; contains a little dark gray siltstone in the lower part
636	655	19	Shale, dark gray to grayish black, silty, interbedded with medium to medium dark gray (shaly) siltstone
655	675	20	Shale, dark gray to grayish black, silty in the lower part
675	685	10	Shale, medium dark to dark gray, with black carbonaceous streak; some black highly carbonaceous shale to coal, pyritic
685	695	10	Shale, dark gray to grayish black, carbonaceous; some olive gray fireclay; a large amount of siltstone to sandstone (very fine grained), medium to medium dark gray
695	705	10	Sandstone, light gray, some medium gray, very fine grained, somewhat sideritic, contains mica, and carbonaceous specks

705	711	6	Coal; some olive gray fireclay; sandstone very light to light gray, very fine to fine grained; some medium grains, subangular to subrounded
711	720	9	Fireclay, medium to medium dark gray; small amount of black, highly carbonaceous shale to coal; sandstone, very light gray, fine to coarse grained
720	740	20	Some coal to highly carbonaceous, black shale at the top; sandstone, light gray, very fine grained; some medium dark gray shale in the lower part
740	750	10	Some shale, black, highly carbonaceous with a little coal; a very large amount of olive gray to medium gray, fireclay, highly sideritic in part
750	760	10	Shale to siltstone, medium dark gray, micaceous with carbonaceous specks; some sandstone light to medium gray, very fine grained, sideritic in part
760	779	19	Sandstone, light to medium gray, very fine grained to siltstone, sideritic, some medium dark gray silty shale at the top
779	808	29	Sandstone, very light gray, fine to coarse grained, some granules and pebbles, subrounded with large grains rounded
808	820	12	Sandstone, very light gray, very fine to medium grained, subrounded to rounded; small amount is sideritic and some dark gray shale in the lower part
820	826	6	Sandstone, very light gray to brownish gray, very fine to fine grained, somewhat calcareous, somewhat sideritic
826	855	29	Sandstone, white to very light gray, fine to coarse grained, some granules at the top and many at the bottom, subrounded, some rounded grains, many secondary crystal facets
855	865	10	No sample
865	875	10	Sandstone, very light gray, ^{very} fine grained to medium grained, subrounded, some rounded coarse grains; small amount of dark gray shale
875	903	28	Sandstone, very light gray at the top to light gray at the bottom, very fine to fine grained, somewhat sideritic, small amount of mica and chlorite, somewhat calcareous at the bottom
903			<u>MAUCH CHUNK FORMATION 457 FEET</u>
903	906	3	Shale, dark gray to dark greenish gray, some grayish brown
906	924	18	Siltstone to very fine sandstone, medium to medium dark gray and dark greenish gray; a large amount of dark yellowish brown siderite
924	943	19	Shale, grayish brown to very dusky red, soft; some dark greenish gray shale and siltstone in the lower part
943	1102	59	Not described
1102	1150	28	Siltstone to very fine sandstone, medium light to gray to greenish gray, some brownish gray at the top, highly calcareous, chloritic

1130	1245	115	Not described
1245	1257	12	Shale, medium gray, a large amount of black interstitial material (Fe compound), chloritic and micaceous, very fine grained, highly calcareous in the lower part
1257	1278	21	Siltstone to very fine sandstone, medium light gray to greenish gray, chloritic, micaceous interbedded with dark gray shale
1278	1281	5	No sample
1281	1289	8	Sandstone, light gray; very fine grained; a very large amount of dark greenish gray, soft shale, and some grayish brown to brownish gray
1289	1320	31	Shale, grayish brown to brownish gray, silty; some light to medium gray and greenish gray (shaly in part) siltstone
1320	1325	5	Limestone, medium dark gray to brownish gray, dolomitic, very finely crystalline
1325	1340	15	Shale, dark gray to limestone, dark gray to brownish black, very shaly, fossiliferous (crinoidal)
1340	1352	12	Limestone, brownish black, fossiliferous, some crinoid fragments, very shaly
1352	1360	8	Shale, dark gray with with calcified crinoid fragments, and fossil fragments; some medium dark gray fossiliferous limestone; some medium gray to olive gray dolomite
1360			<u>GREENSBRIER LIMESTONE 284 FEET.</u>
1360	1377	17	Limestone, light olive gray, sandy (very fine grained)
1377	1396	19	Shale (silty at top) to siltstone (shaly at the bottom), medium dark to dark gray and dark greenish gray; a large amount of dark gray to brownish gray and very dusky red shale in the upper part
1396	1410	14	Shale, dark gray to grayish black; limestone, brownish black
1410	1415	5	Limestone, brownish black, very shaly to a dark gray, calcareous shale, highly fossiliferous, some crinoids, bryozoa, etc
1415	1423	3	Limestone, brownish black, very highly oolitic, shaly in part
1423	1428	5	Limestone, light olive gray, oolitic in part, dolomitic in part
1428	1445	17	Limestone, light olive gray, ^{some olive gray,} fossiliferous (ferms?)
1445	1463	18	Limestone (very shaly) to shale (very highly calcareous) olive gray to medium dark gray
1463	1479	16	Limestone (very shaly) to a calcareous shale, ^{brownish} black & brownish black to grayish black

- 1479 1488 9 Limestone, brownish black to dusky yellowish brown, very shaly; some grayish black to brownish black, calcareous shale
- 1488 1494 6 Limestone, light olive gray to brownish gray, some brownish black, highly oolitic (fine to coarse grained), very sandy (very fine to medium grained, rounded to well rounded), silty, somewhat argillaceous
- 1494 1508 14 Limestone, light olive gray, highly oolitic (fine to coarse grained); a very large amount of medium dark to dark gray, slightly dolomitic to dolomitic shale in the lower part
- 1508 1520 12
22 Limestone, dark yellowish brown to brownish gray, somewhat argillaceous, extremely fine to finely crystalline
- 1520 1532 32 Limestone, olive gray to brownish gray, highly oolitic, very sandy (very fine to fine grained, some medium grains, well rounded), very silty argillaceous; a large amount of brownish, oolitic and sandy limestone to a silty and sandy shale at the bottom
- 1552 1565 15 Limestone, olive gray (at top) to light olive gray and pale yellowish brown (at bottom), highly oolitic, sandy (very fine grained), argillaceous in part to dark greenish gray and grayish brown shale (moderate amount)
- 1565 1578 15 Limestone, light olive gray to pale yellowish brown, oolitic (oolites are indistinct), silty and argillaceous (upper part), some olive gray and dark greenish gray to brownish gray and grayish brown shale (bottom very silty)
- 1578 1595 17 Limestone-oolites, olive gray, a large amount of dark greenish gray to olive gray and brownish gray shaly siltstone, dolomitic
- 1595 1617 22 Limestone, light olive gray, dolomitic, highly (colloidal) argillaceous, silty
- 1617 1644 27 Limestone, pale to dark yellowish brown, silty, somewhat argillaceous, very highly oolitic, oolitic (oolites tightly packed)

HAMPSHIRE (CATSKILL) FORMATION, 538 FEET.

- 1644 1656 12 Sandstone (very fine) to siltstone, medium to medium dark gray (with greenish cast) at top, light to dark gray (black interstitial material) and dark greenish gray with slight greenish brown at bottom, contains shale (detrital shale grains) slightly medium to coarse quartz grains
- 1656 1680 24 Sandstone, mottled greenish gray to dark greenish gray and grayish brown, argillaceous, slightly calcareous, very fine grained, silty; some olive gray very fine sandstone in middle part; some shale, grayish brown to grayish red and very dusky brown
- 1680 1692 12 Shale, dark gray to grayish black; moderate amount of dark greenish gray to medium dark gray siltstone, some very dusky red to grayish brown
- 1692 1716 24 Sandstone, light to medium gray, some dark gray (shaly) streaks, very fine grained, dolomitic, contains some fine to medium (rounded) grains

716	1725	9	Shale, brownish gray to dusky brown, sandstone greenish gray, very fine, silty, argillaceous to a dark greenish gray, sandy and silty shale, dolomitic
1725	1734	9	Sandstone, Shale, (very fine, silty, argillaceous) to shale (very sandy and silty) medium dark to dark gray, some dark greenish gray, a little grayish brown
1734	1747	15	Sandstone (very fine) to siltstone and shale (very sandy and very silty) in the upper part to sandstone (very fine) and siltstone at the bottom, medium to medium dark gray and dark greenish gray, brownish gray to dark grayish brown
1747	1770	25	Shale and siltstone, medium dark to dark gray and dark greenish gray, brownish gray to grayish brown and dusky brown, small amount is dolomitic
1770	1778	8	NO SAMPLE
1778	1790	12	Shale, grayish brown to grayish red and very dusky red, dark gray to dark greenish gray, silty
1790	1815	25	Siltstone and shale, mostly medium dark to dark gray in the upper part and medium dark gray to olive gray and dark greenish gray in the lower part, dolomitic in part at the bottom
1815	1830	15	Shale and some siltstone, dark gray; some medium gray and some greenish gray siltstone; trace of coal
1830	1843	15	Sandstone, light to medium gray, some dark gray, very fine to fine grained, dolomitic, silty; contains some mica, Chlorite and some carbonaceous material
1843	1866	22	Shale (silty and sandy) to sandstone (silty, argillaceous), medium dark gray to greenish gray, ^{dark greenish gray} interbedded with brownish gray to grayish brown and dusky brown, silty shale

1865	1874	9	Shale and siltstone, dark greenish gray to medium dark and dark gray, grayish brown to dusky brown, small amount is highly dolomitic
1874	1880	6	Sandstone, medium dark gray to dark gray, very fine grained, silty, a large amount of black interstitial matter (Fe?)
1880	1894	14	Shale, dark greenish gray to medium dark gray, moderate amount of grayish brown, some dark gray to grayish black, very silty in part
1894	1919	25	Shale and siltstone, grayish brown and dusky brown to very dusky red
1919	1944	25	Sandstone, medium light to medium gray, very silty, very fine grained, contains mica, chlorite and kaolinite, a large amount of olive gray to to greenish gray at the top, highly dolomitic at the bottom
1944	1951	7	Siltstone, medium dark gray, some dark gray, small amount is dolomitic; some dark gray shale
1951	1960	9	^{Siltstone} Shale, brownish gray to dusky brown, highly argillaceous, sandy (very fine); some medium dark gray to dark greenish gray siltstone; some dusky brown shale
1960	1975	15	Shale and siltstone, grayish red to dusky brown; some medium to medium dark gray and dark greenish gray shale and siltstone
1975	1999	24	Siltstone, with large amount of shale at top and bottom, dark greenish gray to medium dark gray, contains mica and chlorite, some kaolinitic and carbonaceous material, sideritic in part
1999	2018	19	Siltstone and shale, grayish brown to dark dusky brown, interbedded with dark greenish gray to medium dark gray siltstone and silty shale
2018	2042	24	Shale, grayish brown, silty
2042	2057	15	Sandstone, (very fine), brownish gray to dusky brown, highly argillaceous, very silty, micaceous; some grayish brown shale in lower part
2057	2077	20	Siltstone, grayish brown to dusky brown and brownish gray, very shaly, sandy (very fine) in part; some light to medium gray and greenish gray, very fine sandstone; a large amount of grayish brown to very dusky red
2077	2087	10	Sandstone, light gray to light brownish gray and greenish gray, very fine to fine grained, some medium to coarse grains, very slightly dolomitic
2087	2112	25	Siltstone ^{to} shale, brownish gray to dusky brown, sandy (very fine) in lower part; a large amount of grayish brown shale in the middle part
2112	2130	18	Siltstone and sandstone (very fine), medium light gray to greenish gray, somewhat dolomitic to dolomite and highly argillaceous in the lower part
2130	2155	25	Siltstone (highly argillaceous), dark greenish gray to brownish gray, dolomitic in ^{part} ; a large amount of brownish gray shale from 2136 to 2145 and at the bottom; some dark ^{greenish} gray and brownish gray shale

4155	2172	17	Siltstone, with some very fine sandstone, medium dark gray, some medium dark gray to dark gray, some dark greenish gray to medium dark gray, slightly dolomitic, pyritic in upper part
2172	2182	10	Shale and siltstone, dusky brown to grayish brown and grayish red, some dark greenish gray to medium dark gray
			<u>SHENUNG FORMATION, 428 FEET.</u>
2182	2206 "")_	24	Sandstone, very fine to fine grained, very silty in part, light to medium gray, light olive gray to medium gray in the lower part, contains small amount of black interstitial material except at bottom where it appears to be altered
2206	2244	38	Siltstone to very fine sandstone, medium light to medium dark gray, some greenish gray to dark greenish gray and light olive gray, small amount of grayish brown in the upper part
2244	2254	10	Siltstone, dark gray
2254	2276	22	Siltstone to sandstone (very fine), medium dark gray in the upper part to medium gray in the lower part, micaceous (color due to interstitial iron), somewhat dolomitic; some dark gray to grayish black silty shale
2276	2291	15	Sandstone (very fine) to siltstone, medium dark to medium gray and some dark greenish gray at the top, medium gray with greenish cast in the lower part, some fine to coarse grains at the bottom; contains mica, chlorite, kaolinite and carbonaceous material
2291	2306	15	Sandstone (conglomeratic) ^{coarse silt} to very fine sand (matrix) with fine to very coarse sand, poorly sorted, greenish gray to light olive gray to medium light gray, somewhat dolomitic
2306	2323	17	Shale, medium dark gray, some olive gray, a very small amount of grayish brown and brownish gray in the lower part; small amount of very light gray to light gray sandstone at the bottom
2323	2330	7	Shale, silty, brownish gray, moderate amount of dark gray, some grayish brown; some light brownish gray to light olive gray siltstone at the bottom
2330	2340	10	Sandstone (very fine) to siltstone, light to medium dark gray (with greenish cast), some fine to very coarse sand grains, poorly sorted; some dark gray shale at the bottom
2340	2350	10	Shale, very silty, dark gray; siltstone to very fine sandstone (with some fine to medium grains), medium gray, most of the siltstone has greenish cast, the sandstone contains dark interstitial material
2350	2360	10	Sandstone (very fine), silty, light gray, some medium gray
2360	2370	10	Shale, dark gray; shale, brownish gray, some grayish brown to grayish red; this shale is present in part of interval
2370	2376	6	Siltstone and shale, olive gray, kaolinitic, some light gray medium to coarse sand grains; some dark gray shale

2376	2379	3	Shale, dark gray, soft, small amount of grayish brown, contains scattered medium to coarse quartz grains
2379	2387	6	Shale and siltstone, brownish gray, some olive gray to medium gray
2387	2439	52	Shale, dark gray and siltstone, medium dark gray, some medium dark gray to greenish gray; some olive gray shale; mostly light gray to medium gray siltstone to very fine sandstone at 2398-2405
2439	2446	7	Shale and siltstone, brownish gray to olive gray some medium dark gray; trace of gray, brownish shale
2446	2454	8	Shale, olive gray to dark gray; siltstone, light olive gray to medium gray
2454	2462	8	
2454	2454	2452	Siltstone to sandstone (very fine), brownish gray to dark gray; some light to medium gray; some dark gray shale
2462	2484	22	Siltstone, medium dark gray with greenish cast; shale, dark gray, to olive gray; mostly shale from 2469-77
2484	2492	8	Siltstone (coarse) to sandstone (very fine), dark gray and brownish gray to grayish black, argillaceous (color due to Fe?)
2492	2507	15	Siltstone, (coarse) light to medium gray in upper part and light to medium dark gray in lower part; some dark gray shale
2507	2516	9	Siltstone, brownish gray to dark gray and grayish black, some medium dark gray, a large amount of olive gray to dark yellowish brown in lower part; some shale, dark gray with a little greenish brown
2516	2532	16	Siltstone, medium gray to medium dark gray, some brownish gray to dark gray and grayish black; shale, medium dark to dark gray, some olive gray and to medium dark gray
2532	2542	10	Siltstone, medium light to medium dark gray; some dark gray shale
2542	2568	26	Shale, dark gray to olive gray, some dark yellowish brown, mostly dark gray in the middle part; a moderate amount of medium dark gray siltstone, some light olive gray at the top
2568	2590	22	Shale and some siltstone, dark gray, some dark yellowish brown, some grayish black in the lower part
2590	2610	20	Shale and siltstone, olive gray to medium dark, and dark gray, some grayish black