

Luther Howell #2 (148)

By Owens Illinois Glass Co.,
Grant Dist., Monongalia Co., W. Va.,

PERMIT - Mon - 121

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Top
Bottom
Thickness

Dunbar

120	126	6	Siltstone, silvery white, containing black & white micas in addition to spherulites of siderite. But for size of grains it could have been a sandstone
126	127	1	Limestones light brown, slightly chaly, vigorously effervescing when placed in HCl, 70% (II) Sandstone, white, containing black & white micas, chlorite and siderite spherulites. It is fine-grained and angular, 15% (III) Siltstone, is above grading into silty shale of the same color. These rock fragments have a green hue, 10% (IV) Shale, dark brown, disintegrating in water, 5%
127	139?	12	Samples missing
139?	145	6	Sandstone, white, very fine-grained, angular, with muscovite, chlorite and siderite
145	171	26	Limestones brown, chaly , vigorously effervescing when placed in HCl, 65% (II) Shale, silvery white, with a very light hue of green, grading into siltstone of the same color, 20% (III) Shale, light-gray with spherulites of siderite, 10% (IV) Shale, very dark-gray, 5%

TOP Bottom

Thickness

171	189	18	Sandstone, white, very fine-grained, angular to subangular, with muscovite, chlorite, specks of siderite and some biotite, 95% (I) Sediments from above, 5%
189	195	6	Limestone brown, shaly, effervescing when placed in HCl, 50% (II) Siltstone, silvery-white containing muscovite, biotite & specks of siderite
195	203	8	Siltstone, as above, 75% (II) calcareous shell, as above, 25%
203	213	10	Siltstone, gray, shaly, ? Monophakela ?
213	220	7	Shale, brownish-gray to grayish brown, 75% (I) shale, gray, 15% (III) shale, light-grayish-brown, disintegrating in water, 5% (IV) Coal, 5% (Waynesburg?)
220	226	6	Shale, light-gray, 80% (II) Shale, light-gray, clayey, disintegrating in water, 10% (III) Sandstone, white, very fine-grained, angular, 5% (IV) Shale, very dark-gray, associated with coal, 5%
226	261	35	Sandstone, white, fine-grained, angular, with few specks of chlorite and more abundant siderite, 97% (II) Shale, gray, disintegrating in water, 3%

Top / Bottom Thickness

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|------|------|----|--|
| 261 | 266 | 5 | Sandstone, white, medium-grained angular to subrounded, containing muscovite and few plates of chlorite, calcareous, effervesces in HCl. |
| 266 | 271 | 5 | Shale: (I) light-gray, 85% (II) brown, 10% (III) gray to dark gray, thinly laminated and tending to part when placed in water, 5 |
| 271 | 282 | 11 | Limestone, brown, slightly shaly, 90% (I) shale, very dark-gray, somewhat calcareous, associated with carbonaceous material, 10% |
| 282 | 289 | 7 | Limestone, brown, compact |
| 289 | 312? | 23 | Shale, light-gray, 5% (II) shale, silvery gray, silty, 20% (III) shale, brown, compact, 20% (IV) shale, gray, clayey, disintegrates in water, 3% |
| 289? | 312? | 23 | Limestone, brown, 85% (II) limestone, dark brown, 5% (III) shale, light silvery-green, some portions of which are silty, 10% |

Top / Bottom / Thickness

- 312? 322 10 Shale, gray, 50% (II) Shale, dark-gray, carbonaceous, 50%
- 322 332 10 Limestone, brown, 80% (II) Siltstone, gray, with a greenish hue, 10% (III) Shale, brownish-gray, disintegrating in water, 10%
- 332 345 13 Siltstone, having a green hue. But for size of grains it could have been a sandstone, 50% (II) Shale, gray, 20% (III) Shale, grayish brown, associated with organic material, 30%
- 345 352 7 Sandstone, of green hue, very fine-grained and grading into typical siltstone. Angular, with some siderite
- 352 359 7 Sandstone, as above, 70% (II) Limestone, brown, 20% (III) Shale and siltstone, light-green, 10%
- 359 369 10 Limestone, very light-gray, very shaly and tending to disintegrate when placed in water
- 369 374 5 Shale, calcareous, effervesces in HCl (I) red, 90% (II) green, 10%

Top/Bottom/Thickness

- 374 379 5 Shale, green, partly silty 90% (II)
shale, red, 10%
- 379 389 10 Shale, very light-greenish-gray, disinte-
grating in water, 85% (II) Shale,
gray, 15%
- 389 399 10 Shale, light-gray, 77% (II) Siltstone,
light-gray, of sandy nature, with
spots of siderite & some chlorite,
10% (III) Shale, brown to red, 10%
(IV) shale, red, thinly laminated,
and parting, when placed in
water, 3%
- 399 409 10 Siltstone, gray to dark-gray, shaly
fossiliferous, also containing small
fragments of green shale, 60%
(I) Siltstone, very light-brown,
compact, 40%
- 409 415 6 Siltstone, very light brown to
brown, as above 90% (II)
Shale, green 8% (III) Shale,
gray, thinly laminated & tending
to part in water, 2%
- 415 419 4 Shale, green, disintegrating in water,
90% (II) Shale, brown, calcareous,
compact, 10%

419 428

9 Limestone, brownish-gray, compact, 70%
(II) Shell, green, some of it slightly ulti,
15% (III) Shell, gray, thin, laminated
and parting in water 10% (IV) Shell,
very dark gray, 5%

428 433

5 Sandstone, white, with green patches,
due to the presence of chlorite
calcareous, extremely fine-grained,
angular, pyritiferous, almost
a coarse-grained siltstone, 85%
(II) Limestone & shaly fragments from
the above formations, 15%

433 443

10 Shell, green, clayey, disintegrating
completely in water, 75%
(II) Shaly limestone, dark chocolate
brownish-gray, 10% (III) Limestone,
light-brown, compact, 5%
(IV) Shell, thinly laminated &
tending to part, when placed in
water, 10%

443 450

7 Shell, green, as above, 70% (II) Limestone
brown to light brown, compact, 25%
(III) Siltstone, red, sandy, 5% (IV)
Fragment of siltstone, green, containing
black fragments of organic(?)
material, which now is collophanes

- 450 455 5 Limestone, light-brown, compact, containing microfossils, 95% (I) Shale green, 5%
- 455 460 5 Sandstone, white, very fine-grained, angular, frosted, containing muscovite, chlorite and specks of siderite, 75% (II) Limestone, brown, shaly, compact, slightly dolomitic, 25%
- 460 465 5 Limestone, brown, 75% (II) Limestone dark brownish-gray, 20% (III) Shale, green, 5%
- 465 470 5 Sandstone, white, very fine-grained, angular, frosted, with muscovite, chlorite & specks of siderite, 90% (II) Limestone, brown, as above, 10%
- 470 501 31 Sandstone, as above, 90% (II) Shale, very dark-gray, 10%
- 501 513 12 Sandstone, as above
- 513 517 4 Sandstone, as above, 80% (II) Shale, dark-gray, silty, 15% (III) Shale, very dark-gray, 5%
- 517 521 4 Coal (Sewickley Maple town Coal)

52/	53/	10	Shale, dark-gray, associated with coal
531	544	13	Limestone, brown, compact, 85% (I) Limestone, very dark-gray to dark-gray, shaly, bestrewed with small crystals of pyrite and emitting H_2S , when placed in HCl .
544	674	130	Sample missing
674	702	28	Limestone, brown, 57% (II) Limestone, dark-brown, 20% (III) Shale, light-gray, disintegrates in water, 15% (IV) Siltstone, light-gray, of sandy nature, 20% (V) Shale, thin, laminated and partings when placed in water, 2% (VI) Shale, green, 2%
702	738	36	Limestone, brown, 40% (II) Shale, green, a portion of which is silty, 40% (III) Shale, dark-gray, 10% (IV) Shale, red, 10%
738	745	7	Sandstone, white, fine to medium-grained, angular to subrounded, frosted, pyritic

- 745 751 6 Sandstone, as above, 95% (I) Shale, gray, 5%
- 751 756 5 Sandstone, white, very fine-grained angular, containing pyrite, some dolomite, and a larger amount of siderite, 85% (II) Shale, light-gray, 10% (III) Shale, gray, 5% (IV)
- 756 793 37 Shale, grayish-green, 75% (II) Shale, brown, compact with a large amount of siderite spherulites
- 793 798 5 Shale, almost white, clayey, completely disintegrating in water, 40% (II) Siltstone, gray, of sandy nature; almost as typical sandstone, 40% (III) Shale, dark chocolate brownish-gray, 20%
- 798 803 5 Sandstone, light-gray, having a white cement very fine-grained, angular, & containing some carbonaceous material, 85% (II) Shale, brown, compact, 5% (III) Shale, dark-gray, 5% (IV) Coal, 5%
- 803 811 8 Sandstone, as above, 90% (II) Shale, almost brownish white, disintegrating in water, 5% (III) Shale, gray, 5%

- 811 816 5 Shale, nearly white, disintegrating in water, calcareous, 75% (II) Shale, brown, pyritic, 5% (III) Sandstone cavings from above
- 816 823 7 Sandstone, white, very fine-grained, angular, frosted, with a little chlorite, and a white cement, which may be siderite. It also contains carbonaceous material, 25% (II) Shale, nearly white, as above, calcareous, 25%
- 823 833 10 Sandstone, as above, 50% (II) Shale, nearly white, calcareous, 35% (III) Shale, brown, to light-brown, very calcareous, 10% (IV) Quartz, white, milky, in wedge-shaped coarse fragments, 5%
- 833 839 6 Siltstone, very light-gray, of sandy nature, with a greenish hue due to the presence of chlorite. It also contains small spherulites of siderite, 97% (II) Shale, gray & brown, disintegrating in water, 3%
- 839 850 11 Siltstone, as above, 60% (II) Shale, light-green, 10% (III) Shale, chocolate brownish-gray, associated with carbonaceous material 30%

- 850 857 7 Shale, gray, 75% (II) Shaly limestone, brown, 15% (III) shale chocolate brownish-gray & few fragments of white sandstone, due to caving from above, 10%
- 857 864 7 Limestone, very light-brown to brown, 75% (II) Shale, very light-gray to gray, 25%
- 864 871 7 Sandstone, white, very fine-grained, angular, slightly pitted, containing specks of siderite
- 871 881 10 Sandstone, as above, 70% (II) Shale, gray, with a greenish line, 25% (III) Limestone, brown, 5%
- 881 896 15 Sandstone, white, very fine-grained, angular, pitted, containing a small amount of larger fragments of quartz, 85% (II) Shale, gray, 15%
- 896 910 14 Shale, gray, 85% (II) Shale, reddish, 10% (III) Shale, yellowish-green, disintegrating in water, 5%
- 910 935 25 Shale, gray to chocolate brownish-gray
- 935 945 10 Shale, red, 50% (IV) Shale, green, 50% Both components effervesce in HCl

- 945 955 10 Shale, effervescing in HCl, calcareous (I) green, 85% (II) red, 10% (III) gray, 5%
- 955 961 6 Shale (I) green 94% (II) red, 3% (III) brown, 3%
- 961 967 6 Shale, gray to brownish red, completely disintegrating in water, (II) shale, green, about 4% (III) shale, green, calcareous, effervescing in HCl.
- 967 973 6 Shale of different colors: (I) green, 50% (II) maroon, 30% (III) gray 15% yellowish-green, 5%
- 973 985 2 Shale, red
Allegheny?
- 985 991 6 Sandstone, green, very fine-grained, angular, almost a siltstone, 98% (II) shale, green, 10% (III) shale: red, gray, yellowish, due to caving from above.
- 991 1006 15 Sandstone, green, being very slightly coarser than the one above; it contains specks of siderite
- 1006 1021 15 Sandstone, green, very fine-grained, almost a siltstone, 75% (II) siltstone, brown, with a large amount of siderite spherulites, 10% (III) shale, red, disintegrating in water, 10% (IV) miscellaneous shale fragments, 5%

- 1021 1026 5 Shale, green, silty, 90% (I) Shale, very light gray, 5% (III) Shales due to cavings from above, 5%
- 1026 1032 6 Shale, green, 77% (I) Siltstone, green, 5% (II) Shale, red, disintegrating in water, 10% (III) Shale, brown, compact, 5% (IV) Shaly limestone, light-gray, 3%
- 1032 1038 6 Shale, predominantly red, 60% (I) Siltstone, green, 5% (II) Shale, green, 10% (III) Shale, brown, 5% (IV) Shale, gray, disintegrating in water, 10%
- 1038 1058 20 Shale, red, 80% (I) Shale, green, 15% (II) Shale, gray, 5%
- 1058 1068 10 Siltstone, green, with siderite spherulites, 50% (I) Shale, gray, 5% (II) Siltstone, green, of sandy nature, 10% (III) Shale, red, 25% (IV) Shaly limestone, light-gray, 10%
- 1068 1080 12 Shale, green, silty, 75% (I) Siltstone, green, 10% (II) Shale, gray, disintegrating in water, 5% (III) Shale, red, 5% (IV) Limestone, shaly, 5%

- 1080 1097 17 Shale, green, silty, 55% (II) Shale, dark gray, 20% (III) Shale, light-gray, disintegrating in water, 10% (IV) Shale, red, 10% (V) Siltstone, shaly, light brown, 5%
- 1097 1100 3 Shale, dark-gray, silty
- 1100 1113 13 Shale, as above, 95% (II) Shale, white, disintegrating in water, 5%
- 1113 1137 14 Shale, dark-gray, fossiliferous
- 1137 1149 2 Shale, brownish light-gray, disintegrating in water, 10% (II) Shale, brownish, 75% (III) Shale, gray, 5% (IV) Siltstone, light-brown, 10%
- 1149 1151 2 Shale, brown, thinly laminated & tendency to parting when placed in water, 15% (II) Shale, red, disintegrating in water, 5% (III) Shale, brownish, 5% Siltstone, green, with siderite spherulites, 25%
- 1151 1170 19 Siltstone, ^{green} partly shale, with spherulites of siderite, 75% (II) Shale, green to red, 25%
- 1170 1180 10 Siltstone, as above, 90% (II) Shale, due to cavings from above, 10%

- 1180 1190 10 Siltstone, as above, almost a sandstone 85%
 (II) shale, brown, disintegrates in water, 10% (III) shale, chocolate brownish-gray, 5%
- 1190 1195 5 Shale, greenish-gray, with siderite spherulites, 80% (II) siltstone, light-gray, 10%
 (III) shale, gray, 5% (IV) shale, brownish-white, 5%
- 1195 1202 7 Siltstone, greenish-gray, with spherulites of siderite, 90% (II) shale, of different hues, 5% (III) shaly limestone, 2%
- 1202 1213 11 Siltstone, as above, 40% (II) shale, gray, red to greenish-gray, disintegrating in water, 45% (IV) shale, brown, 10%
 (V) shale, very dark-gray, 5%
- 1213 1223 10 Siltstone, greenish-gray almost a sandstone, 45% (II) shale, gray, disintegrating in water, 50% (III) shale, chocolate brownish-gray, 5%
- 1223 1231 8 Sandstone, white, very fine grained, angular, sideritic, 50% (II) shale, gray to brownish-gray, 50%

- 1231 1236 5 Sandstone, as above, 25% (II) Shale, light-gray, 55% (III) Shale, brownish-gray, 20%
- 1236 1242 6 Shale, very light-grayish green, containing a large amount of siderite spherulites, 85% (II) Shale, brownish-gray, 10% (III) Shale, red, 5%
- 1242 1248 6 Sandstone, white, very fine-grained, angular, frosted containing muscovite, chlorite & some siderite, 50% (I) Shale, gray, 35% (II) Shale, brown to light-brown, 10% (IV) Shale, red, 5%, perhaps due to caving from above
- 1248 1258 10 Shale, whitish-gray, disintegrating in water, 15% (II) Shale, greenish-gray, disintegrating in water, 70% (III) Caving from above, 15%
- 1258 1269 11 Shale, gray 80% (II) Sandstone white, very fine-grained, angular, 20%
- 1269 1278 9 Sandstone, as above, chloritic, 75% (II) Shale, brownish or red, 25%

- 1278 1286 8 Sandstone, as above
- 1286 1292 6 Sandstone, white, containing a brown cement, and effervesces in HCl. It is fine-grained, angular, frosted, with a large number of muscovite plates & some siderite.
- 1292 1298 6 Sandstone, as above, 90% (II) Shale, brown, disintegrates in water, 10%
- 1298 1302 4 Shale, ranging from gray to red, and disintegrates in water.
- 1302 1308 6 Sandstone, white, very fine-grained, angular, with some chlorite & siderite
- 1308 1326 18 Siltstone, gray, 50% (II) Shale, gray, 50%
- 1326 1343 17 Shale, gray to dark gray, 95% (II) shale, red, disintegrates in water, 5%
- 1343 1350 7 Shales: (I) chocolate brownish-gray, associated with coal, 80% (II) red, 5% (III) green, 5%

- 1350 1360 10 Shale, chocolate brownish-gray, 90%
 (II) shale, black carbonaceous, 5%
 (III) shale, light-green, 5%
- 1360 1378 18 Shale, gray, 60% (II) Sandstone, brownish,
 very fine-grained, angular, 30%
 (III) shale, light-gray, with spherulites
 of siderite, 5% (IV) coal, 5%
- 1378 1396 18 Shale, chocolate brownish-gray, 85%
 (II) shale, red, 5% (III) shale, greenish-
 gray, 10%
- 1396 1409 13 Sandstone, white, very fine-grained, angular
 to subrounded, frosted with siderite,
 95% (II) shale, green + red, 5%
- 1409 1414 5 Sandstone, white, as above, 65%
 (II) shale, red, 15% (III) shale, green,
 15% (IV) shale, gray, 5%
- 1414 1424 10 Sandstone, as above, 10% (II) shale,
 brown, disseminated with very fine
 angular quartz fragments, 65%
 (III) shale, black, 10% (IV) shale,
 brown, 10% (V) shale, red to
 reddish-brown, 5
- 1424 1434 10 Siltstone, gray, shaly

- 1434 1441 7 Siltstone, as above, 50% (II) shale, gray, 30% (III) shale, brown, 20%
- 1441 1467 26 Sandstone, white, very fine-grained angular to subrounded, pitted, with siderite specks, 85% (II) shale, red, 5% (III) shale, green, 5% (IV) shale, gray & brown, 5%
- 1467 1484 17 Sandstone, as above, 90% (II) shale, gray, 10%
- 1484 1491 7 Sandstone, white, as above, 65% (II) shale, dark gray to gray, silty, carbonaceous, 30% (III) shale, green, 5%
- 1491 1500 9 Sandstone, white as above, 95% (IV) shale, green, disintegrating in water, 5%
- 1500 1511 11 Sandstone, as above, 95% (II) shale, gray, 5%
- 1511 15²⁰ 9 Shale, gray, 83% (II) shale, brown 10% (III) fine stone, white, 2% (IV) sandstone, white, very fine-grained, angular, pitted, 5%

- 1520 1526 6 Sandstone, white, very fine-grained, angular, with yeeds of siderite, 50% (II) Siltstone, gray, shaly, 50%
- 1526 1535 9 Sandstone, as above, 70% (II) Shale, gray, very slightly silty, 28% (III) Chalk, green, disintegrating in water, 2%
- 1535 1534 19 Sandstone, white, angular to subrounded, coarse-grained, frosted
- 1534 1563 9 Sandstone, white, very coarse-grained angular, composed of milky quartz or ordinary quartz, which is frosted
- 1563 1577 14 Sandstone, white, coarse-grained, angular
- 1577 1583 6 Siltstone, gray, of sandy nature
- 1583 1609 16 Shale, gray, with spherulites of siderite
- 1609 1614 5 Siltstone, gray, 70% (II) Siltstone, brown, 30%
- 1614 1620 6 Sandstone, white, very fine-grained, angular, with some dolomite & yeeds of siderite, 75% (II) Siltstone, gray, shaly, 25%
- 1620 1635 15 Sandstone as above, 50% (II) Shale, dark-gray, 45% (III) Shale, gray & red, 5%

1635	1647	12	Shale, green, completely disintegrating in water, 95% (II) shale, dark gray, 5%
1647	1657	10	Shale, green, as above, 60% (II) shale, red, 20% (III) shale, dark gray, 10%
1657	1667	10	shale, red, 50% (II) shale, green, 50%
1667	1685	18	Shale, red, 50% (II) shale, green, 35% (III) shale, white, 10% (IV) shale, dark-gray, 5%
1685	1691	6	Shale, red, 45% (II) shale, almost white, 5%
1691	1698	7	Shale, red 80% (II) shale, gray, 10% (III) shale, green, 10%
1698	1705	7	Shale, red, 85% (II) shale, green, 10% (III) shale, gray, 5%
1705	1721	16	Samples missing
1721	1731	10	Shale, red, 60% (II) siltstone, green, of sandy nature, with specks of siderite, 35% (III) shale, almost white, 5%
1731	1750	19	Siltstone, green, 65% (II) siltstone, reddish-brown, 25% (III) shale, brown to red, 10%

- 1750 1772 22 Siltstone, green, 50% (II) Shale, red, 50%
- 1772 1787 17 Siltstone, green, containing chlorite & pebbles of siderite. If the size of grains were a trifle larger, it would have been a fine-grained sandstone.
- 1789 1798 9 Siltstone, dark-green, of sandy nature, containing chlorite & pebbles of siderite
- 1798 1804 6 Siltstone, as above, 85% (II) Shale, green, 15%
- 1804 1812 8 Siltstone, green, containing chlorite & pebbles of siderite. Almost a sandstone
- 1812 1820 8 Siltstone, white with a greenish hue, 85% (II) Shale, greenish-gray, slightly silty, 15%
- 1820 1848 28 Siltstone, as above
- 1848 1860 12 Shale, gray, thinly laminated
- 1860 1872 12 Limestone, dark-brown, 75% (II) Shale, like the above, probably due to cavings from above
- 1872 1887 15 Shale, red, 45% (II) Siltstone, green, 30% (III) Shale, green, 5% (IV) Shale, gray, 10% probably due to cavings from above, (V) Siltstone, almost white, 10%

- 1887 1892 5 Limestone, brownish-white, slightly fossiliferous, 75% (I) Shales, predominantly thinly laminated and tending to parting when placed in water. These are due, very probably, to cavings from above, 25%
- 1892 1897 5 Limestone, dark brown, probably shaly, 80% (II) Shale, gray, as above, due to cavings from above
- 1897 1910 13 Limestone, brownish-white, 70% (I) shale gray, slightly calcareous, 25% (III) Shale, green, 5%
- 1910 1918 8 Limestone, as above, 80% (II) Shale, red, 10% (III) Shale, gray, 10%
- 1918 1960 42 Limestone, brown, compact
- 1960 1965 5 Limestone, light brown to brown, 85% (II) Shale, green, 15%
- 1965 1971 6 Limestone, brown, 95% (II) Shale, green, 5%
- 1971 1977 6 Limestone, brown, compact
- 1977 1980 3 Limestone, light brown, compact ~~with~~ subrounded fine grains of quartz

Pocahontas?
Big Spring?

- 1980 1982 2 Sandstone, white, very calcareous,
medium-grained, subrounded.
- 1982 1987 5 Sandstone, white, fine-grained,
angular to subrounded, calcareous.
80% (II) shale, yellow, 10%
(III) shale, gray, 10%
- 1987 1992 5 Sandstone, white, very fine-grained,
angular to subangular, calcareous.
- 1992 2025 23 Sandstone, white, as above, very
calcareous & slightly dolomitic,
containing a few larger, angular,
grains of quartz.
- 2025 2030 5 Sandstone, white, medium-grained with
coarser grains of quartz also present.
It is subangular to subrounded,
and calcareous.
- 2030 2046 16 Sandstone, white, fine-grained, angular,
calcareous, effervescing in HCl.
- 2046 2049 3 Sandstone, white, fine-grained, angular.
- 2049 2075 26 Sandstone, as above, 75% (II) shale, green, partly
ally, 25%.

- 2075 2087 12 Sandstone, white, very fine-grained, angular, the lower five feet being greenish because of the presence of chlorite. Very little siderite & muscovite present.
- 2087 2095 8 Sandstone, as above, 75% (II) Siltstone, gray, 5% (III) Shale, gray, 20%
- 2095 2119 24 Shale, gray
- 2119 2133 14 Shale, gray, 85% (II) Siltstone, gray, 15%
- 2133 2142 9 Siltstone, gray, shaly, 80% (II) Shale, gray, 20%
- 2142 2150 8 Shale, gray
- 2150 2157 5 Shale, gray, 50% (II) Siltstone, light gray, 50%
- 2157 2172 17 Shale, gray, 50% (II) Siltstone, green, 50%
- 2172 2184 12 Siltstone, almost white, of sandy nature almost a sandstone, 85% (II) Shale, gray, 15%
- 2184 2190 6 Sandstone, white, very fine-grained, angular, slightly frosted, 25% (II) Shale, gray, 5%
- 2190 2202 12 Sandstone, as above, slightly coarser, 95% (II) Shale, as above, 5%

- 2202 2212 12 Sandstone, white, as above, 75% (II) shale, gray, 25%
- 2212 2230 28 shale, gray, 50% (II) siltstone, greenish-light-gray, 37% (III) shale, brown, 15%
- 2230 2237 7 shale, gray, slightly silty
- 2239 2247 8 shale, gray, 75% (II) shale, gray, slightly silty, as above, 20% (III) shale, gray, 5%
- 2247 2255 8 siltstone, gray, shaly, 70% (II) shale, gray, 25% (III) shale, brown, 5%
- 2255 2266 11 shale, gray
- 2266 2278 12 shale, gray, 80% (II) shale, brown, 20%
- 2278 2287 9 siltstone, grayish-green, 50% (II) shale, gray, 50%
- 2287 2295 8 shale, gray, portions of which are very slightly silty
- 2295 2329 34 siltstone, greenish-gray, slightly shaly, 80% (II) shale, gray, 20%
- 2329 2339 10 siltstone, greenish-gray, of sandy nature, 75% (II) shale, gray, 25%
- 2339 2356 17 shale, gray, very slightly silty, 85% (II) shale, brown, 15%

- 2356 2367 11 Siltstone, gray
- 2367 2377 10 Shale, gray
- 2377 2397 20 Siltstone, gray, very shaly
- 2397 2407 10 Siltstone, light gray, of sandy nature
- 2407 2419 12 Siltstone, as above, 80% (II) Shale, gray, very silty, 20%
- 2419 2445 26 Shale, gray.
- 2445 2451 6 Shale, greenish-gray to chocolate brownish-gray
- 2451 2460 9 Siltstone, gray to green, of sandy nature, 70% (II) Shale, gray, 30%
- 2460 2473 13 Sediments as above, with about 3% of large milky quartz fragments
- 2473 2488 15 Shale, gray, slightly silty
- 2488 2499 11 Sandstone, white, very fine-grained, angular, containing very coarse fragments of angular milky quartz, 80% (II) Shale, as above, 20% due to cavings from above

- 2499 2517 18 Sandstone, white, very fine-grained, angular and subangular
- 2517 2530 13 Sandstone, as above, 50% (II) shale, gray, 50%
- 2530 2539 9 shale, gray
- 2539 2544 5 Sandstone, white, very fine-grained, angular, containing a few larger grains of quartz, 85% (II) shale, gray, 15%
- 2544 2567 23 Sandstone, as above
- 2567 2576 9 Shale, gray, 30% (II) Sandstone, as above, 10% perhaps due to cavings from above, (III) siltstone, grayish-green, 10%
- 2576 2579 3 Sandstone, as above, 75% (II) shale & siltstone, as above, perhaps due to cavings, 25%
- 2579 2583 4 Shale, gray, 98% (II) Sandstone, as above, 2%
- 2583 2587 4 Shale, gray, 80% (II) siltstone, grayish-green, 15% (III) Sandstone, as above, 5%
- 2587 2591 4 Sandstone, as above, 85% (II) shale, gray, 15%
- 2591 2599 8 Sandstone, white, fine-grained, angular to subrounded, frosted

- 2599 2610 11 Shale, chocolate brownish-gray, 95% (II)
Siltstone, white, of sandy nature with
specks of siderite
- 2610 26²⁷ 17 Shale, as above, 85% (II) Siltstone, as above,
15%
- 2627 2632 5 Shale, red, 40% (II) Shale, green, 20%
(III) Siltstone, white, almost a very
fine-grained sandstone, 20% (IV) Shale,
gray, 20%
- 2632 2639 7 Shale, gray, 50% (II) Sandstone or siltstone,
white, 30% (III) Shale, green, 10%
(IV) Shale, red, 20%
- 2639 2645 6 Siltstone, greenish-gray, 65% (II) Shale,
red, 25% (III) Shale, greenish to grayish-
green 10%
- 2645 2672 27 Sandstone, white, very fine-grained, angular,
compact, 85% (II) Shale, gray, 15%
- 2672 2677 5 Sandstone, as above, 75% (II) Shale,
gray, thinly laminated, 25%
- 2677 2682 5 Shale, gray,

- 2682 2689 7 shale, as above, 25% (II) Siltstone, shale, gray, 15% (III) shale, red, 10%
- 2689 2706 17 Siltstone, green to greenish-gray, 60% (II) shale, red, often silty, 25% (III) shale, gray, 15%
- 2706 2710 4 Sandstone, generally white, with a slight greenish hue, very fine-grained, angular, chloritic, with specks of siderite, 40% (II) shale, gray to greenish-gray, 50% (III) shale, red, 10%
- 2710 2727 17 shale, red, 30% (II) Siltstone, dull red, 25% (III) Siltstone, green, 25% (IV) shale, gray to greenish-gray, 20%
- 2727 2734 7 shale, red, 60% (II) Siltstone, red, shaly, 25% (III) shale, green, 15%
- 2734 2740 6 shale, red, 90% (II) shale, grayish-green, 10%
- 2740 27⁵⁰ 10 shale, red, 80% (II) shale, red, silty, 10% (III) shale, green, partly silty, 10%
- 2750 2758 8 Sandstone, white, very fine-grained, angular, 40% (II) shale, greenish-gray, 30% (III) shale, red, 30%

- 2758 2768 10 Sandstone, as above, almost a siltstone, 90%
 (I) shale, red, 5% (II) shale, green, 5%
- 2768 2783 15 shale, red, 60% (II) siltstone red, shaly, 20%
 (III) shale, grayish-green, 20%
- 2783 2789 6 Siltstone, green to red, of sandy nature &
 shaly, 70% (II) shale, red, 20% (III)
 shale, gray, 10%
- 2789 2815 26 shale, red, 50% (II) siltstone, red, shaly, 10%
 (III) siltstone, green, of sandy nature,
 20% (IV) shale, green, 20%
- 2815 2825 10 shale, red, 30% (II) shale, red, silty, 30% (III)
 shale, grayish-green, 40%
- 2825 2832 7 shale, red, 60% (II) siltstone, red, shaly, 30%
 (III) shale, greenish-gray, 10%
- 2832 2839 7 shale, greenish-gray, 60% (II) shale, red, 40%
- 2839 2847 8 shale, red, 45% (II) shale, red, silty, 25%
 (III) shale, green, 30%
- 2847 2862 15 shale, grayish-green 35% (II) siltstone,
 greenish, 15% (III) shale, red, 30%
 (IV) shale, red, silty, 20%

- 2862 2872 10 Shale, grayish-green, 70% (II) shale, greenish
of sandy nature, 20% (III) shale, red,
10%
- 2872 2889 16 Siltstone, greenish, of sandy nature, 60%
(II) shale, grayish-green, 20%
(III) shale, gray, 10% (IV) shale, red, 10%
- 2888 2905 17 Siltstone, green, 75% (II) shale, grayish-
green, 20% (III) shale, red, 5%
- 2905 2915 10 Siltstone, red, 40% (II) shale, red, 15%
(III) shale, gray, 10% (IV) siltstone,
green, 25% (V) shale, green, 10%
- 2915 2922 7 shale, red, 25% (II) siltstone, red shaly,
25% (III) siltstone, green, 30%
(IV) shale, green, 20%
- 2922 2935 13 shale, greenish-gray, 60% (II) siltstone,
greenish-gray, of sandy nature, 25%
(III) shale, red, 15%
- 2935 2942 7 Siltstone, red, of sandy nature & shaly,
35% (II) siltstone, white to greenish,
of sandy nature, 35% (III) shale,
red, 15% (IV) shale, greenish-gray, 15%

- 2942 2951 9 Sandstone, white, very fine-grained, angular, frosted, with a moderate amount of siderite occurring in spots, 70% (II) shale, red, 15% (III) shale, greenish-gray, 15%
- 2951 2955 4 Sandstone, as above, 75% (II) shale, gray, 25%
- 2955 2969 14 Shale, greenish-gray
- 2969 2979 10 Shale, as above, 90% (II) shale, red, 10%
- 2979 2993 14 Shale, greenish-gray, 90% (II) shale, red, 5% Siltstone, fine, of sandy nature, 5%
- 2993 3008 15 Shale, greenish-gray, 60% (II) Siltstone, brownish-red, of sandy nature, 40%
- 3008 3014 6 Sediments, as above, plus 3% of angular, coarse grains of milky quartz
- 3014 3037 23 Sandstone or sandy siltstone, white to greenish-gray, containing large angular fragments of milky quartz, 80% (II) shale, greenish-gray, 20%
- 3037 3043 6 Sandy siltstone, reddish-brown, as above
- 3043 3049 6 Sandy siltstone, as above 97% (II) shale, greenish-gray, 3%

3049 3057 6 Shale, gray, 75% (H) siltstone, greenish, of
sandy nature, 25%

3057 3065 8 Shale, gray