

United Carbon Company, W. M. Ritter Lumber Co. No. 1-V
Series No. 1461

Location: 2200' 8. of 37° 15' 11,850' W. of 81° 55'
Richlands Quadrangle, Garden District,
Buchanan County, Virginia

Elevation: 1619.2' spirit level, ground

Commenced: 8020-47

Completed: 2-1-48

Initial Open flow: 17,196,000 Cu. Ft. (natural)
(after blowing open 80 hours)

Interval

- 649-655 Shale, medium dark gray (N4)*, slightly silty.
- 655-664 Shale, as 649-655, 70%; and medium gray (N3), silty, micaceous shale, 30%.
- 664-666 Sandstone, medium light gray (N7), very fine-grained, strongly peppered with black mineral, micaceous, clusters, 80%; shale, silty and slightly micaceous, 20%.
- 666-670 Sandstone, as 664-666; 3% shale, as 664-666. Piece of coal.
- 670-674 Sandstone, as 664-666, small clusters to friable, also peppered with green mineral; 5% grayish black to black shale, some very carbonaceous black shale.
- 674-679 Sandstone, as 670-674, grading to large clusters, to dark medium gray (N4), fine-grained, very micaceous sandstone peppered with black mineral. Silty shale, 5%.
- 679-684 Sandstone, as 674-679.
- 684-688 Sandstone, as 674-679, 85%; shale, dark gray (N3), slightly silty and micaceous.
- 688-693 Sandstone, as 674-679, very little shale. Coal pieces.
- 693-698 Shale, dark gray (N3), silty and micaceous, to grayish black, very slightly micaceous; 5% sandstone, as 688-693. Numerous coal pieces. (Company log: coal fragments 693-698.)
- 698-701 Siltstone, medium gray (N5), slightly peppered with minute to black mineral and slightly micaceous, 30%; sandstone, as above, 50%; shale, 20%. Trace grayish black carbonaceous shale.
- 701-704 Sandstone, as above, 95%; grayish black carbonaceous shale, pieces of coal.
- 704-714 Sandstone, as above, 95%; grayish black carbonaceous shale, pieces of coal. (Company log: coal fragments 708-711).
- 714-722 Sandstone, as 701-704, 98%.
- 722-736 Shale, medium dark gray (N4), slightly micaceous, to gray black (N2), carbonaceous, 50%; sandstone, as 701-704, 50%. Pieces of coal. (Company log: coal fragments, 726-730).

* Letters and numbers in parentheses refer to color designation from the National Research Council's Rock-Color Chart.

Interval

- 736-741 Shale and sandstone, as 722-736.
- 741-745 Sandstone, as 722-736, 60%; shale, of coal.
- 745-750 Sandstone, as 722-736, small clusters to friable. Little carbonaceous shale. Several pieces of coal. (Company log, coal fragments from 747-750).
- 750-756 Sandstone, as 722-736; 8% shale, medium dark gray (N4), slightly micaceous. Trace of coal.
- 756-768 Sandstone, as 722-736. No coal noted.
- 768-773 Sandstone, as 722-736, friable, 95%; shale, 5%. Few rather small pieces of coal.
- 773-778 Sandstone, very light gray (N8), very fine-grained, sub-rounded, slightly peppered with small black some green minerals, friable with small clusters, 93%; shale, brownish gray to gray black, carbonaceous, 7%. Iron staining.
- 778-788 Sandstone and shale, iron staining, as 773-778.
- 788-793 Shale, dark gray (N3), slightly micaceous, some slightly silty, 90%; sandstone, 10%.
- 793-800 Shale, 95%; sandstone, 5%.
- 800-814 Sandstone, as above, 50%; sandstone, brownish gray (5YR 41) very fine-grained, very poorly sorted, calcareous cement, 40%; shale, gray-black, carbonaceous, 10%. Little shaly coal and coal.
- 814-820 Sandstones and shale, as 800-814.
- 820-823 Sandstone, very light gray (N8), fine-grained, subangular, rather poorly sorted, micaceous slightly peppered with black and some green (gauconite?) minerals, friable but few small clusters. Coal fragments (cavings?).
- 823-830 Sandstone, as 820-823, very fine- to fine-grained, friable; few coal fragments.
- 830-836 Sandstone, very light gray (N8), as 820-823 and some as 773-778, brownish gray as 800-814. Some coal fragments (cavings?). Noted several pieces of quartz, medium- to coarse-grained size appearing to be broken. Conglomeratic?
- 836-842 Sandstone, as 830-836. Quartz pieces. Trace black, very micaceous shale.
- 842-847 Sandstone, as 830-836. Larger quartz fragments.
- 847-856 Sandstone, very light gray (N8), medium-grained, subangular,

Interval

- poorly sorted, friable, slightly micaceous, few clusters peppered with black mineral. Numerous coal fragments. Noted several coarse-grained size quartz fragments.
- 856-864 Sandstone, fine- to medium-grained, as 847-856. Few quartz fragments.
- 864-870 Siltstone, yellowish gray (5Y 8/1), subrounded, rather poorly sorted. Small cut.
- 870-876 Shale, medium dark gray gray (N4), slightly micaceous and very slightly silty, 60 per cent; medium gray (N5) shaly siltstone, 30 per cent; sandstone, as 847-850, 10 per cent. All small pieces.
- 876-883 Shale, dark gray (N3), slightly micaceous, 95 per cent; sandstone, 5 per cent.
- 883-893 Siltstone, very light gray (N8), subangular to subrounded, rather well sorted, friable, micaceous.
- 893-904 Sandstone, light gray (N7), fine-grained, subangular to subrounded, rather well sorted, friable to small clusters peppered with black and few green minerals. Trace black carbonaceous shale and black micaceous slightly silty shale.
- 904-915 Sandstone, "§ " "
- 915-920 Sandstone, as 893-904.
- 920-930 Sandstone, as 893-904, friable. Pieces coal and approximately 1 per cent dark shale.
- 930-940 Sandstone, small cluster, " " "
- 940-950 Sandstone, friable to small clusters, " "
- 950-955 Sandstone, as 893-904, friable to small clusters.
- 955-960 Sandstone, as 950-955. Some brownish gray (5Y 4/1) siltstone.
- 960-963 Sandstone, as 950-955. Some dark gray shale and brownish siltstone.
- 963-967 Sandstone, very light gray (N8), very fine-grained, subrounded, poorly sorted, friable, 60 per cent; sandstone, as 950-955, 40 per cent.
- 967-971 Sandstone, as 963-967, 50 per cent; as 960-963, 40 per cent; shale, medium and dark gray, 10 per cent.
- 971-974 Coal and shale, grayish black, carbonaceous, 90%, shale, blackish gray, slightly micaceous, some pyritic, 25 per cent; sandstone, as 967-971, 25 per cent.

Interval

- 974-979 Sandstone, very light gray (N8) with much iron staining, fine- to medium-grained, subangular to subrounded, poorly sorted; about 1 per cent shale as above (caving?).
- 979-984 Sandstone, medium grained, as 974-979, coarse-grained (or larger) white quartz and gray chert angular fragments (broken pebbles?).
- 984-988 (On envelope: Coal fragments are cavings according to driller. Driller stated that drilling was too hard for coal to have been present. Formation supposedly white sandstone). Coal. Little sandstone as above. Gray chert "larger than coarse-grained size."
- 988-991 Shale, dark gray, slightly micaceous (N3), 60 per cent, sandstone, as 979-984, 40 per cent, with yellowish gray and light brownish gray coarse to larger than coarse size chert broken fragments and few quartz fragments, probably pebbles.
- 991-994 Sandstone, light gray (N7), very fine-grained, subrounded rather well sorted, friable, 80 per cent; sandstone, as 979-984, with few medium-grained size chert, 10 per cent; shale.
- 994-1001 Sandstone, light gray (N7), fine-grained, clusters peppered with black mineral, 60 per cent; shale, medium gray (N5), slightly micaceous, and very slightly silty, 40 per cent. Very small cut.
- 1001-1009 Detrital appearing sample. Sandstone and shale as above, trace mica. Pieces of coal. Some larger quartz pieces, possibly pebble, and chert fragments.
- 1009-1014 Sample, as 1001-1009, no chert noted. Little coal, but 5 per cent black carbonaceous shale.
- 1014-1021 Sample, as 1009-1014, 10 per cent shale; trace pyrite.
- 1021-1026 Sample as 1014-1021; same iron staining.
- 1026-1030 Sample as 1014-1021, 20 per cent shale; some iron stains. (Did not note any quartz fragments.)
- 1030-1034 Sandstone, medium light gray (N6), very fine-grained, subrounded, moderately well sorted, micaceous, friable to very small clusters peppered with black mineral. Several pieces coal. Five per cent grayish black (N2) slightly micaceous to carbonaceous shale.
- 1034-1036 Sandstone, very light gray (N8), as 1030-1034, friable; some iron staining.

Interval

1038-1047	Sandstone, light gray (N7), very fine-gto fine-grained, subrounded to subangular, poorly sorted, some black mineral inclusions, small clusters.
1047-1052	Sandstone, " " " "
1052-1055	Sandstone, " " ". Trace yellowish brown (10YR 6/4) silty shale.
1055-1060	Sandstone, " " " " and some dark gray shale.
1060-1065	Sandstone, " " " " 3 per cent dark gray shale. Few medium-grained quartz grains. No coal noted, as on co. log from 1063-65.
1065-1069	Sandstone, light yellowish gray (5 Y 9/1), very fine-grained, subrounded, rather well sorted, friable; 5 per cent very small dark gray shale fragments; trace yellowish brown silty shale and mica. Few medium-grained quartz.
1069-1075	Sandstone, " " " "
1075-1079	Sandstone, " " ; 2 per cent shale. No quartz.
1079-1082	Shale, dark gray (N3), slightly micaceous. Trace grayish black (N2) shale.
1082-1085	Shale, " " " ; 10 per cent very light gray (N7.5) fine-grained sandstone slightly peppered with black mineral, friable to clusters.
1085-1086	(on envelope: "Show gas 1086") Sandstone, as 1082-1085, 85 per cent; shale, as 1082-1085, 15 per cent.
1086-1090	Sandstone, " " " " "
1090-1094	No sample.
1094-1097	Sandstone, as 1085-1086, few clusters; shale, 5 per cent.
1097-1100	Sandstone, " " 85; shale, 15 per cent.
1100-1104	Sandstone, as 1085-1086, micaceous.
1104-1110	Sandstone, " " , clusters.
1110-1115	Sandstone, " friable to clusters, 95 per cent. Five per cent dark gray (N2.5) micaceous shale.
1115-1120	Sandstone, " " " "

Interval

1120-1135	Sandstone, light yellowish gray (5YR8/5/1) " "
1135-1140	Shale, medium gray (N5).
1140-1150	No sample.
1150-1164	Shale, medium gray (N5), slightly micaceous and silty, fairly chunky.
1164-1176	Shale, as 1150-1164.
1176-1183	Shale, as 1150-1164, silty.
1183-1200	Shale, " "
1200-1217	Shale, dark gray (N3.5), slightly micaceous, some slightly silty.
1217-1225	Shale, medium gray (N5), slightly micaceous, silty.
1225-1236	Shale, " " " " ; 1 per cent light gray (N6.5) siltstone, with very slightly calcareous cement.
1236-1247	Siltstone, as 1225-1236, 40 per cent; very light gray (N8) very fine-grained sandstone, 30 per cent; shale, as 1225-1236, 30 per cent.
1247-1260	Siltstone, 50 per cent; sandstone peppered with black mineral, 30 per cent; shale, 20 per cent.
1260-1270	Sandstone, very light yellowish gray (5Y 9/1), very fine-grained, moderately poorly sorted, friable to small clusters very slightly peppered with black mineral, 85 per cent; siltstone, 10 per cent; shale, 5 per cent.
1270-1280	No sample.
1280-1282	Shale, medium dark gray (N4), slightly micaceous, some silty. Trace medium dark gray siltstone. Five per cent sandstone clusters as 1260-1270.
1282-1285	Sandstone, friable to clusters, as 1280-1282; 50 per cent; shale, 50 per cent.
1285-1290	Sandstone, very light gray (N8.5) stained with iron, very fine-grained to medium-grained, subangular, very poorly sorted, friable to few clusters with few black and brown mineral inclusions. Numerous coarse-grained and larger clear and milky quartz fragments, appearing to be broken pebble fragments. Shale, 2 per cent.
1290-1295	Sandstone, as 1285-1290, friable, smaller grain size.

Interval

1295-1302	Sandstone, " " " " " Few quartz fragments (pebbles?).
1302-1307	No sample.
1307-1313	Sandstone, medium- to very fine-grained, as 1285-1290. Numerous coarse-grained and larger quartz fragments.
1313-1317	Sandstone, as 1307-1313, much iron staining. No noted quartz fragments.
1317-1322	Sandstone, as 1307-1313, few larger quartz fragments.
1322-1328	Sandstone, " " " ". Trace mica.
1328-1338	Sandstone, " " " " "
1338-1345	Sandstone, " " " " "
1345-1350	Sandstone, very fine- to fine-grained, as 1307-1313. Trace mica.
1350-1355	Sandstone, very fine- to fine-grained, as 1307-1313. Trace mica. Numerous quartz fragments.
1355-1357	Sandstone, as 1345-1350, numerous quartz fragments.
1357-1360	Sandstone, very fine- to some medium-grained, as 1345-1350. Numerous large quartz fragments.
1360-1363	Sandstone, as 1357-1360, not
1363-1365	Sandstone, as 1357-1360. Some quartz fragments. Piece coal and little grayish black carbonaceous shale.
1365-1378	Sandstone, as 1357-1360; numerous quartz pieces. Little iron staining; about 1 per cent grayish black small shale.
1378-1382	Sandstone, white (N9), as 1357-1360. Numerous pieces white quartz fragments.
1382-1385	Sandstone, as 1378-1382; no noted quartz fragments, but very small cut.
1385-1390	Sandstone, " several quartz fragments; iron stains.
1390-1397	Sandstone, " no noted quartz fragments; iron stains.
1397-1400	Sandstone, as 1378-1382, few quartz fragments, little staining.
1405-1409	Sandstone and conglomerate. Sandstone, very light gray (stained with iron), fine- to medium-grained, subangular, poorly sorted, friable, 50 per cent, broken pieces of angular quartz, medium to much larger than coarse-grained size, 50 per cent. Few pieces coal, very little grayish

Interval

black shale.

- 1409-1416 Coal, 75 per cent; sandstone, dark gray (N3.5) fine-grained, subrounded, poorly sorted, very locally calcareous, 15 per cent; sandstone and conglomerate, as 1405-1409, 10 per cent. Small cut.
- 1416-1419 Sample as 1409-1416. Very small cut. One piece showing dark gray sandstone on quartz fragment.
- 1419-1425 Sandstone, dark gray, as 1409-1416, 50 per cent, sandstone, dark gray (N3), very fine-grained, very micaceous, appearing to have siliceous cement, 50 per cent. Piece shaly coal.
- 1425-1431 Siltstone, medium-gray (N5.3), poorly sorted, shaly, micaceous.
- 1431-1437 Siltstone, " "
- 1437-1447 Coal, shaly and carbonaceous shale, 60 per cent; sandstone, medium light gray (N6), mottled, medium-grained, subrounded, poorly sorted, slight calcareous cement, 20%. Sandstone, light gray (N7), peppered with black and green (glauconite?) minerals, medium-grained, subrounded, 20 per cent.
- 1447-1456 Shale, dark gray (N3) carbonaceous, 30%; shale, medium dark gray (N4) slightly fissile, 30%; sandstone, as 1437-1447, 40%. Trace pyrite and coal.
- 1456-1462 Sandstone, light gray, fine-grained, subangular, poorly sorted, some black and few green and reddish grains included, locally calcareous, 75%; medium dark gray shale as 1447-1456, 25%.
- 1462-1468 No sample.
- 1468-1478 Sandstone, light gray, fine-grained, subangular to subrounded, poorly sorted (very fine to medium grains), friable, some black and green (glauconite?) grains, micaceous, few clusters locally calcareous, 90%; shale 10%.
- 1473-1482 Sandstone, as 1468-1473, more clusters, 85%; shale, 15%.
- 1482-1486 Sandstone, " " 95%; " 5%;
- 1486-1494 Sandstone, as 1468-1473, more clusters, 97%.
- 1494-1500 Sandstone, " , becoming more friable, 98%.
- 1500-1513 Shale, medium gray (N5), silty, slightly micaceous, 85%; sandstone, as 1491-1500, 15%. Few pieces of coal.

Interval

1513-1520	Shale, as 1500-1513, 90%, sandstone, medium light gray (N5), fine-grained, subangular, poorly sorted, shaly, 5%; sandstone, as 1500-1513, 5%. More coal pieces.
1520-1526	Sandstone, light gray (N7), fine- to medium-grained, subangular, poorly sorted, slightly micaceous, becoming friable, 90%; shale, as 1513-1520, 10%.
1526-1535	Shale, medium gray (N5), slightly micaceous and silty, 10%; sandstone, 10%.
1535-1547	Shale, as 1526-1535; 80%; sandstone, medium light gray (N6), very fine- to fine-grained, subangular, poorly sorted, shaly, 10%; sandstone, as above, 10%.
1547-1550	Coal. Medium dark gray (N4) slightly micaceous and silty shale, 10%.
1550-1560	Shale, as 1547-1550, 90%; coal, 10%; some carbonaceous shale. (No brown shale noted in our cut.)
1560-1566	Shale, medium gray (N5), slightly micaceous.
1566-1575	Shale, " "
1575-1600	Shale, medium gray to medium light gray, silty.
1600-1607	Sandstone, light gray (N7) strongly peppered with black mineral and little light and dark (glaucinite?) green, minerals, fine-grained, subrounded, poorly sorted, micaceous; shale, 10%.
1607-1615	Sandstone, as 1600-1607, becoming friable; medium dark gray (N4) very micaceous sandstone as light gray sandstone, 10%.
1615-1624	Sandstone, light gray, friable to few clusters, as 1607-1615; medium dark gray shale, 5%.
1624-1638	Shale, medium light gray to dark gray (N3) on fresh break, slightly micaceous. Pieces coal. Small cut.
1638-1645	Shale, dark gray (N3.5), some slightly micaceous; medium gray (N5) shale, 10%.
1645-1648	No sample.
1648-1656	Shale, medium gray (N5), slightly micaceous and silty.
1656-1667(?)	Shale, dark gray (N3), coated to seem medium light gray (N6), slightly micaceous and silty.
1667-1675	Shale, " "
1675-1681	Shale, " ", 50 per cent; sandstone,

Interval

- very light gray (N8), fine-grained to medium-grained, sub-angular, poorly sorted, mottled with green and black minerals, very calcareous cement, 50%.
- 1681-1686 Sandstone, friable, as above, approaching clastic, sandy limestone, shale, 20%.
- 1686-1690 Sandstone, as 1681-1686, cement only silty calcareous.
- 1690-1695 Sandstone, very light gray (N8) to white (N9), as 1686-1690, 75%; white sandstone, fine-grained, subangular to sub-rounded, poorly sorted, very few black mineral inclusions, 25%; very slight calcareous cement.
- 1695-1700 Sandstone, white, as 1690-1695, micaceous, 90%; shale, medium dark gray (N3), slightly micaceous, 10%.
- 1700-1708 Shale, dark gray (N3), with small black mineral inclusions, 75%; siltstone, light gray (N7), 25%.
- 1708-1714 Siltstone, as 1700-1708, 50%; shale, 45%; brownish gray (5YR 5/1) shale, 5%.
- 1714-1721 Sandstone, as 1690-1695, strongly peppered with black and some brown minerals, micaceous, 90%; shale, dark gray, 8%, brownish gray 2%.
- 1721-1727 Sandstone, " " " " "
- 1727-1740 Sandstone, " " " " "
- 1740-1748 Sandstone, as 1714-1721, 90%; brownish gray shale, 5%; dark gray shale, 5%.
- 1748-1755 Sandstone, as 1714-1721, with black and green minerals included, 80%; shale, dark gray (N3), 10%; brownish gray shale, 10%. Trace pyrite.
- 1755-1765 Sandstone, as 1714-1721, very fine- to medium-grained, friable, 70%; dark gray shale, 20%; brownish gray, 10%. Trace of coal and pyrite.
- 1765-1767 Sandstone, light gray, as 1755-1765, 75%; shale, medium dark gray, 20%; brownish gray, 5%. Trace magnetite and pyrite.
- 1767-1775 Sandstone, as 1765-1767, 85%; shale, 15%. Trace pyrite.
- 1775-1785 Sandstone, as 1765-1767, 93%; shale, 7%.
- 1785-1793 Shale, brownish gray-black (5YR 3/1), 35%; shale, dark gray (N3), 35%; sandstone, as 1775-1785, 30%. Some brown gray (5YR 4/1) calcareous shale with black inclusions. Noted one coarse sand grain of broken quartz.

Interval

- 1800-1810 Sandstone, as 1775-1785, 75%; shale, dark, 16%, light, calcareous, 7%. Medium-grained quartz fragments, broken?
- 1810-1817 Sandstone, more clusters, as 1775-1785, 70%; shale, medium dark gray (N4), 20%; shale, as above, 8%; some brownish gray (5YR 4/1), very slightly calcareous, some blackish red (5R 2/2).
- 1817-1829 Sandstone, as above, 85%; dark gray shale, as above, 15%. Few broken quartz coarse-grained size, one with fine-grained sandstone attached.
- 1829-1837 Sandstone, as above, 93%; shale, 7%. Noted 1 quartz fragment, pebble broken?.
- 1837-1840 Sandstone, as above, 97%. Noted several quartz fragments.
- 1840-1848 Shale, medium gray (N5), very minutely calcareous.
- 1848-1855 Shale, grayish red (5R 4/2), some slightly silty, 75%; medium gray, slightly silty, 15%; greenish gray (5GY 5/1) 10%.
- 1855-1860 Shale, as above, red, 80%; medium gray, 10%; greenish gray, 8%. Two per cent medium olive gray (5Y 5/1) shaly limestone.
- 1860-1870 No sample.
- 1870-1882 Shale, medium gray (N5), 75%; limestone, shaly, as above, 20%; red shale 5%.
- 1882-1887 Shale, medium gray to medium dark gray (N3), 55%. Limestone, as above to light olive gray (5Y 7/1), 20% reddshale, 5%, limestone, light gray (N7), clastic, sandy, 20%.
- 1887-1893 Sandstone, medium light gray to medium dark gray (N6-4), very fine-grained, very calcareous cement, 80%. Limestone, as above, 10%; shale, medium dark gray, 10%.
- 1893-1904 No sample.
- 1904-1909 Siltstone, light gray (N6.5), subangular, poorly sorted, calcareous cement, 60%, shale, medium gray (N5), silty, slightly micaceous, 40%. Trace white, fine-grained, poorly sorted sandstone with calcareous cement.
- 1909-1915 Shale, medium light gray (N6), 20%; medium dark gray slightly micaceous shale, 10%; gray red (5R 4/2) to blackish red (5R 2/2) shale, 5%; grayish olive shale 2%; siltstone, as 1904-1909- 10%; sandstone, medium light gray (N6), very fine-grained, subangular, poorly sorted, calcareous cemented, 10%; sandstone, light gray, medium-grain, subrounded, rather poorly sorted, friable, 40%; pale yellowish brown (10YR 6/2) slightly shaly limestone, 3%.

Interval

- 1915-1920 Siltstone, greenish gray (5GY 6/1), and medium light gray, subrounded, rather poorly sorted, calcareous cement, 50%; shale, medium gray (N5) to medium dark gray (N4), slightly micaceous and slightly calcareous, 30%; sandstone, medium gray, friable, as above, 20%.
- 1920-1925 No sample.
- 1925-1934 Sandstone, light gray (N7.5), fine-grained to very fine-grained, subangular, poorly sorted, calcareous cement, some black mineral inclusions, large clusters to friable, covered with light gray calcareous powder.
- 1934-1941 Sandstone, as above, 60%; shale, medium gray (N5), chunky, 40%.
- 1941-1947 Sandstone, very light gray (N8), fine- to medium-grained, subangular to subrounded, poorly sorted, friable, some small clusters with black mineral inclusions, considerable iron staining, 90%; shale, medium and dark gray, little reddish and greenish, 10%. Trace of yellow-brown limestone.
- 1947-1956 Siltstone, very light gray (N8), very fine-grained, subrounded, very slightly calcareous.
- 1956-1964 Siltstone, as above, 60%; shale, brownish gray (5YR 4/1), silty, 40%.
- 1964-1971 Shale, as above, 60%; siltstone, as above, peppered with minute black mineral, 40%.
- 1971-1975 Sandstone, very light gray (N8), very fine-grained, subrounded, friable, some small clusters with some black mineral inclusions and peppered, 90%; shale, light gray to medium dark gray, some reddish and greenish, 10%. Trace of mica.
- 1975-1980 Sandstone and shale, as above.
- 1980-1997 Sandstone and shale, as above, little larger percentage of shale.
- 1997-2005 Shale, medium gray (N5), silty, slightly micaceous.
- 2005-2010 Sandstone, light gray (N7), very fine-grained, subrounded, rather well sorted, peppered with black mineral, 80%; shale, medium dark gray (N4) and micaceous, 20%.
- 2010-2015 Sandstone, as above, 80%; shale, dark gray (N3) to medium light gray (N6), micaceous and silty, 20%. Trace grayish red (5R 4/2) shale, some slightly micaceous.
- 2015-2030 Sandstone, as above, 95%; shale dark gray, slightly micaceous, greenish and grayish red, 5%.

Interval

2030-2040	Shale, medium dark gray (N4), very slightly micaceous to micaceous, slightly silty.
2040-2050	Shale, as above.
2050-2055	Shale, "
2055-2065	Shale, " . Trace yellow brown shale.
2065-2085	Shale, as above, 90%; shale, brownish gray (5YR 4/1), 10%.
2085-2105	Shale, " 75%; medium light gray (N6) silty shale, 25%. (Small cut).
2105-2115	Shale, dark gray (N3) to medium light gray (N6) silty and slightly micaceous, 50%; shale, greenish gray (5GY 6/1), silty, slightly micaceous, 25%; shale, light greenish gray (5GY 8/1), very silty, very slightly peppered with dark mineral, slightly micaceous, 25%. Trace of grayish red (5R 4/2) shale.
2115-2120	Siltstone, light greenish gray (5GY 8/1), very fine-grained, subangular, poorly sorted, shaly, some peppered with minute dark mineral, 70%; shale, dark brownish gray (5YR 3/1), 30%.
2120-2127	Siltstone, as above. Trace medium gray (N5) micaceous shale and grayish red shale.
2127-2133	Siltstone, as above, 75%; sandstone, very light gray (N7.8), very fine-grained, subrounded, moderately well sorted, peppered with dark minute mineral, very slightly calcareous.
2133-2143	Sandstone, as above, clusters to friable. Trace mica and dark gray (N3) and reddish gray shale.
2143-2148	Sandstone, as above, 50%; to light greenish gray (5GY 8/1), micaceous siltstone, 30%; shale, dark gray (N3) slightly micaceous, 18%. Trace reddish and green gray shale.
2148-2153	Sandstone, as above; shale, as above.
2153-2159	Sandstone, as above, friable, very few clusters and much iron staining. Shale, as above. Trace mica.
2159-2165	Siltstone, light gray, (N7), very fine-grained, 90%; shale, medium dark gray (N4), silty, micaceous, 10%.
1265-2170	No sample.
2170-2178	Sandstone, as 2153-2159, clusters. Trace medium gray (N5) shale with reddish streak.

Interval

2178-2190	Shale, medium light gray, slightly silty and micaceous, 50%; light gray (N7) shale, 50%.
2190-2197	Sandstone, very light gray (N8), very fine-grained, subrounded, rather well sorted, friable, few small clusters with small black, brown, and green minerals inclusions, 90%; shale, medium dark gray (N4), very small to large fragment, 10%.
2197-2219	Sandstone, as above, 75%; shale, as above, 25%.
2219-2229	Shale, medium gray (N5), slightly silty, very slightly micaceous.
2229-2250	Shale, as above.
2250-2262	Shale, medium gray (N5), silty, very slightly micaceous.
2262-2271	Limestone, medium olive gray (5Y 5/1), dense to finely crystalline, slightly shaly, 50%; shale, as above, 35%; shale, medium greenish gray (5GY 5/1), silty, 15%. Trace reddish shale and light greenish gray (5GY 8/1) siltstone peppered with minute green mineral.
2271-2281	Limestone, as above, 30%; shale 30%; siltstone, 30%; sandstone, very fine-grained, friable, 20%. (Sample covered with light gray powder making estimation of percentage difficult, possibly less limestone.)
2281-2290	Sandstone, light gray (N7), very fine-grained, subrounded poorly sorted, friable, 50%; shale, 30%; limestone, 20%. (Sample also covered with light gray powder.)
Last sample.	Eloise T. Jacobsen, Geol. U. S. G. S. Lexington, Kentucky February, 1949
2295-2301	Gas pay, reported.
T. D. 2301'	