

UNITED PRODUCING COMPANY *ASHLAND EXPLORATION, INC.*

Yukon-Pocahontas Coal Company, Serial number 2-1466

Location: 250' South of 37° 10' and 14,150' East of 82° 05'.

Hurricane District, Bucu Quadrangle, Buchanan County, Virginia.

Elevation: Ground, 1751'.

124
1300
1751
259

314
1751
279 4

Interval

- 79-83 Graywacke, very light gray (N8), fine-grained, poorly sorted, slightly angular to angular, slightly micaceous, poorly sorted, black mineral, trace green mineral, about 2/3 quartzose.
- 83-89 Shale, silty, medium dark gray (N4), slightly micaceous.
- 89-94 Graywacke, light gray (N7), very fine-grained, poorly sorted, subrounded to subangular, fairly micaceous, considerable fine-grained black mineral, clay cement, little porosity,
- 94-100 Siltstone, micaceous, light gray (N7), coarse-grained, very poorly sorted, subrounded to subangular, considerably peppered with black mineral, friable.
- 100-105 Shale, very silty, medium gray (N5), finely micaceous.
- 105-110 Graywacke, silty, medium light gray (N6), very fine-grained, poorly sorted, very micaceous (muscovite?), very fine-grained black mineral, clay cement, no permeability.
- 110-115 Graywacke, as above, less silty, better sorted, better porosity.
- 122-127 Graywacke, as above, friable.
- 127-133 Graywacke, as above, slightly calcareous cement, 95%; dark gray (N3), carbonaceous shale, and laminated coal.
- 133-138 Graywacke, better cemented, very lightly calcareous.
- 138-145 Shale, medium dark gray (N4), finely micaceous, part slightly silty.

Interval

- 145-150 Graywacke, light gray (N7), very fine-grained, poorly sorted, subangular, some subrounded, micaceous (muscovite?), black mineral, very fine-grained and peppery, clay cement, slightly porous, 95%; coal, conchoidal, high luster and carbonaceous dark gray (N3) and dark gray silty shale, 5%.
- 150-155 No sample.
- 155-161 Graywacke, as above, approaching fine-grained, some medium-grained, moderately friable.
- 161-167 Graywacke, as above, friable.
- 167-174 Graywacke, as above.
- 174-179 Graywacke, slightly calcareous, calcareous cement, very light gray (N8), fine- to medium-grained, subangular, micaceous, considerable black mineral, some green, moderately friable.
- 179-200 No sample.
- 200-205 Graywacke, very light gray (N8), very fine-grained, subangular to subrounded, some black mineral and slightly peppered with black mineral, clay cement, 8/10 quartzose, friable, moderately well sorted.
- 205-212 Graywacke, as above, fine-grained, poorly sorted, some medium-grained also green mineral.
- 212-219 Graywacke, as above, fine-grained, 75% quartzose.
- 219-225 Shale, medium gray (N5), finely micaceous.
- 225-231 Graywacke, very light gray (N8), fine-grained, some medium-grained, slightly micaceous, considerable black mineral, some green and brown, 7/10 quartzose, friable.
- 231-236 Graywacke, as above, part with trace of, calcareous cement.
- 236-243 Graywacke, " " "
- 243-248 Graywacke, " " "
- 248-249 No sample.
- 249-252 Graywacke, as above, very fine-grained, slightly calcareous cement very friable.

Interval

252-257	Graywacke, as above, very fine-grained, slightly calcareous cement.
257-263	Graywacke, calcareous cement, very light gray (N8), medium-grained, some angular coarse-grained quartz, subangular, rather poorly sorted, micaceous, black and some green minerals peppered with black and brown minerals, friable, 2/3 quartzose.
263-270	Graywacke, " " "
270-276	Graywacke, as above, very fine-grained.
276-283	Graywacke, fine-grained, poorly sorted.
283-292	Siltstone, shaly, medium light gray (N4), medium-grained, subrounded, some subangular, micaceous.
292-300	Shale, silty to sandy, medium dark gray (N4), micaceous, (sample needs washing).
300-305	Shale, " " "
305-309	Shale, as above, slightly silty to non-silty.
309-318	Shale, " " "
318-325	Shale, " " "
325-332	Graywacke, very light gray (N8), very fine- to fine-grained, subangular, poorly sorted, micaceous, considerable black mineral, brown and some green mineral, 60% quartzose, clay cement, little porosity, friable.
332-340	Graywacke, " " "
340-346	Shale, medium gray (N5), finely micaceous, particles slightly silty.
346-350	Graywacke, very light gray (N8), very fine- to fine-grained, poorly sorted, micaceous, considerable black, brown, and greenish minerals, 60% quartzose, clay cement, little porosity, friable;
350-359	Graywacke, as above, fine-grained, 50% quartzose, fairly calcareous, cement, slightly less friable.
359-367	Graywacke, partly medium-grained, 40% quartzose.
367-374	Graywacke, non-calcareous, some green mineral grains.
374-380	Graywacke, as above, 5%, light with brownish gray (5YR 6/1) with calcareous cement.

Interval

- 380-390 Shale, medium dark gray (N4), very finely micaceous.
- 390-400 Graywacke, light gray (N7), fine-grained, subangular, poorly sorted, few medium-grained, micaceous, considerable black, brown, and some greenish minerals, 40% quartzose, clay cement, little porosity, moderately friable, 90%; coal, high luster, 5%; shale, dark gray (N3), partly carbonaceous, 5%.
- 400-408 Graywacke, very light gray (N8), fine- to medium-grained, poorly sorted, few coarse-grained angular quartz fragments, some appearing freshly broken, possible conglomerate, trace mica, some black and dark minerals, 85% quartzose, clay cement with a trace of calcareous cement, friable.
- 408-414 Graywacke, medium-grained and green minerals " "
- 414-424 Graywacke, numerous very coarse-grained angular black quartz fragments (conglomerate?).
- 424-435 Shale, medium gray (N5), finely micaceous, dark gray (N3) carbonaceous, 95%; coal, conchoidal fracture, high luster, 5%.
- 435-445 Shale, medium dark gray (N4), finely micaceous.
- 445-455 Shale, silty.
- 455-467 Graywacke, light gray (N7), fine-grained, subangular to subrounded, poorly sorted, numerous brown, black, and green minerals, 40% quartzose, clay cement, friable.
- 467-475 Graywacke, " " " "
- 475-484 Graywacke, with many medium-grained to very coarse-grained broken angular quartz fragments, (conglomerate?).
- 484-493 Shale, dark gray (N3), finely micaceous, and shale, dark gray (N3), carbonaceous; 20%, coal, conchoidal fracture, high luster.
- 492-500 Graywacke, light gray, fine-grained, subangular, to subrounded, poorly sorted, considerably black and dark minerals, very micaceous, 40-60% quartzose, clay cement, little porosity, friable.
- 500-506 Graywacke, little less friable.
- 506-515 Shale, slightly silty, medium gray (N5), finely micaceous.

Interval

515-525	Shale, medium gray (N5), finely micaceous.
525-533	Shale, medium dark gray (N4), silty to slightly silty, micaceous.
533-540	Shale, medium gray (N5).
540-548	Shale, "
548-558	Shale, medium gray (N5), very finely micaceous.
558-565	Shale, " "
566-574	Shale, " "
574-581	Shale, " "
581-592	Coal, high luster, 15% graywacke, very light gray (N8), fine- to medium-grained, subangular, to sub-rounded, poorly sorted, micaceous, considerable black and brown minerals, about 35% quartzose, clay cement, little porosity, moderately friable.
592-600	Same, some green minerals, friable.
600-610	Graywacke, light gray (N7), very fine- to fine-grained, subangular, poorly sorted, micaceous (muscovite?), considerable black and some green and dark minerals, clay cement with trace of calcareous material, 1/2 quartzose, moderately friable.
610-620	Graywacke, very slight trace calcareous material.
620-632	Shale, medium dark gray (N4), finely micaceous, little silty, little carbonaceous, and slightly silty.
632-644	Graywacke, light gray (N7), medium-grained, subangular, to angular, poorly sorted, slightly micaceous, some black and dark minerals, clay cement, about 70% quartzose, moderately friable.
644-650	Graywacke, light gray (N6.5), fine-grained, subangular, poorly sorted, micaceous, considerable black and dark minerals, about 50% quartzose, clay cement, with trace calcareous cement, 80%; graywacke, medium gray (N5), very fine-grained; subangular, poorly sorted, considerable fine black and brown mineral, clay cement, moderate well cemented, 20%.
650-656	Shale, medium gray (N5), micaceous, part slightly silty.

Interval

656-663	Shale, half silty.
663-670	Shale, medium dark gray (N4), trace very fine micaceous material.
670-676	Shale, " "
676-683	Shale, " "
683-690	Shale, Medium light gray (N6), very fine-grained, subangular, very poorly sorted, considerable brown and some green and black minerals, clay cement with trace of slightly calcareous material, about 1/2 quartzose.
690-696	Graywacke, very light gray (N8), " , 80% quartzose, friable.
696-702	Shale, medium gray (N5), very finely micaceous.
702-709	Graywacke, light gray (N7), very fine-grained, subangular, poorly sorted, slightly micaceous, some brown and black material, about 80% quartzose, clay cement, friable.
709-716	Graywacks, light gray to medium light gray (N 7-6), considerable brown and black minerals, about 50% quartzose.
716-726	Siltstone, sandy, medium gray (N5), coarse-grained, micaceous, moderately well cemented, partly with calcareous cement, and partly with shaly cement.
726-736	Shale, medium dark gray (N4), micaceous, trace carbonaceous material.
736-743	Siltstone, shaly, medium gray (N5), grading into graywacke 20%; graywacke, light gray (N7), very fine-grained, subangular to subrounded, very poorly sorted, micaceous, brown and some green minerals, clay cement, slightly calcareous cement, moderately well cemented, about 1/2 quartzose, 80%.
743-750	Graywacke, shaly, medium gray (N5), very fine-grained, subangular, poorly sorted, micaceous, considerable brown and dark minerals, clay cement.
750-756	Coal, partly with conchoidal fracture and partly shaly, 50%; and shale, dark gray (N3), carbonaceous, with part silty and micaceous, 50%.
756-760	Graywacke, silty, medium light gray (N6), very fine-grained, subangular to subrounded, poorly sorted, micaceous, some dark mineral inclusions, clay cement, a trace of calcareous material, 60% quartzose.

Interval

- 760-769 Shale, silty, medium gray (N5), micaceous.
- 769-775 Coal, high luster, some blocky; and graywacke, light gray (N7), very fine-grained, subangular to subrounded, poorly sorted, numerous small brown inclusions, 80% quartzose.
- 775-783 Shale, medium dark gray (N4), micaceous, small particles shaly to silty.
- 789-796 Graywacke, light gray (N7), very fine-grained, subangular to subrounded, poorly sorted, some dark minerals, 80% quartzose, clay cement.
- 796-800 Shale, medium gray (N5), part slightly silty to silty, finely micaceous.
- 800-806 Shale, medium dark gray (N4), micaceous.
- 806-814 Siltstone, medium dark gray (N4), coarse-grained, subangular to subrounded, very poorly sorted, shaly, micaceous, numerous dark mineral grains, clay cement with trace of calcareous material; trace coal.
- 814-820 Shale, silty, medium dark gray (N4), micaceous.
- 820-827 Siltstone, shaly, medium dark gray (N4), micaceous, numerous dark mineral grains, clay cement.
- 827-833 Shale, silty, medium dark gray (N4), very micaceous.
- 833-842 Shale, silty, medium dark gray (N4), micaceous,
- 842-852 Shale, " " , slightly micaceous with lense of coarse-grained siltstone.
- 852-863 Coal, high luster, 40%; shale, slightly silty, medium gray (N5), slightly micaceous and shale, dark gray (N3), carbonaceous.
- 863-874 Shale, " " to micaceous.
- 874-883 Shale, medium gray (N5), very slightly silty, slightly micaceous.
- 883-890 Siltstone, medium gray (N5), coarse-grained, subangular to subrounded, very poorly sorted, micaceous, numerous dark minerals.
- 890-895 Graywacke, medium light gray (N6), fine-grained, subangular, unusually poorly sorted, micaceous, considerable brown and black, and some green minerals, about 40% quartzose, clay cement.

Interval

895-904	Graywacke, light gray (N7), very fine-grained, subangular, very poorly sorted, micaceous, numerous black and brown minerals, some green, clay cement with traces of calcareous cement, about 60% quartzose.
904-914	Graywacke, " little more calcareous.
914-924	Shale, medium dark gray (N4), micaceous.
924-933	Shale, " , silty.
933-940	Shale, " very silty.
924-948	Shale, " non-silty to silty.
948-957	Shale, dark gray (N7), part finely micaceous, part carbonaceous, 90%; coal, high luster, 10%.
957-963	Coal, high luster, conchoidal fracture.
963-971	Shale, medium gray to medium dark gray (N5-4), finely micaceous, partly slightly silty.
971-979	Coal, high luster, blocky.
979-985	Graywacke, light gray (N7), fine-grained, micaceous, considerable dark and black minerals, clay cement, 80% quartzose.
985-995	Siltstone, shaly, medium dark gray (N4), micaceous.
955-1005	Shale, dark gray (N3.5), micaceous to finely micaceous.
1005-1014	Shale, dark gray (N3), carbonaceous, 20%; graywacke, medium light gray (N6) to medium dark gray (N4), very fine-grained, subangular to angular, micaceous, considerable black and dark minerals, clay cement, 65% quartzose.
1014-1022	Graywacke, very light gray (N8), fine-grained, angular to subangular, poorly sorted, slightly micaceous, some black, brown, and green minerals, clay cement, in part calcareous, 80% quartzose.
1022-1027	Graywacke, medium light gray (N6), very fine-grained, subangular to subrounded, poorly sorted, micaceous, numerous black grains, clay cement, about 50% quartzose.
1027-1036	Graywacke, very light gray (N8), medium-grained, angular to subangular, very poorly sorted, slightly micaceous, brown, green and some black minerals, clay and silt cement, 80% quartzose.

Interval

- 1036-1045 Siltstone, medium gray (N5), micaceous, moderately well cemented.
- 1045-1048 Graywacke, very light gray (N8), medium-grained, sub-angular, very poorly sorted, slightly micaceous, some black and green minerals, clay and silt cement, 80% quartzose.
- 1048-1954 Siltstone, partly shaly, medium gray (N5), coarse-grained, micaceous, (sample dirty), moderately well cemented.
- 1054-1065 Siltstone, medium light gray (N6) to medium gray (N5), coarse-grained, micaceous.
- 1065-1072 Graywacke, very light gray (N8), fine-grained, poorly sorted, slightly micaceous, dark minerals, clay and silt cement, 70% quartzose, moderately friable.
- 1072-1077 Graywacke, " some green mineral; high luster, conchoidal fracture, coal, 10%
- 1077-1082 Graywacke, " friable, (no coal).
- 1082-1089 Graywacke, " moderately friable.
- 1089-1095 Graywacke, " partly calcareous cement, friable.
- 1095-1102 Graywacke, " , few dark grains.
- 1103-1107 Graywacke, "
- 1107-1112 Graywacke, "
- 1112-1119 Shale, dark gray (N3), very micaceous, partly sandy; coal, high luster, partly shaly.
- 1119-1125 Shale, " coal, high luster, conchoidal fracture, trace pyrite.
- 1125-1132 Shale, silty, medium gray (N5), micaceous.
- 1132-1140 Shale, "
- 1140-1147 Shale, " , some very silty.
- 1147-1155 Shale, dark gray (N3), carbonaceous, part with very fine micaceous material; coal, medium luster, part slightly shaly, part with high luster.
- 1155-1162 Siltstone, medium dark gray (N4), medium-grained, subrounded, medium well sorted, 40%; graywacke, very light gray (N8), fine-grained, subangular to subrounded, poorly sorted, slightly micaceous, black and brown minerals, clay and silt cement, about 65% quartzose.

Interval

- 1162-1171 Graywacke, same as sample 1152-62.
- 1171-1175 Graywacke, friable.
- 1175-1183 Siltstone, medium dark gray (N4), coarse-grained, well cemented, 80%. Shale, medium dark gray (N4), carbonaceous, 20%.
- 1183-1190
a Graywacke, very light gray (N8), medium-grained, sub-angular to angular, very poorly sorted, slightly micaceous, numerous black, some green, brown, and reddish brown minerals, clay and silt cement, some bluish gray and cream chert fragments, about 65% quartzose, friable.
- 1190-1200 Shale, silty, medium dark gray (N4), micaceous.
- 1200-1207 Shale, medium dark gray (N4), micaceous, part slightly silty.
- 1207-1214 Shale, " " "
- 1214-1220 Coal, blocky, high luster, 80%; shale, silty, dark gray (N3), 20%.
- 1220-1225 Siltstone, medium light gray (N6), to medium gray (N5), part finely laminated, medium-grained, to coarse-grained, slightly micaceous, well cemented.
- 1225-1234 Graywacke, very light gray (N8), very fine-grained, sub-angular, to subrounded, moderately well sorted, very slightly micaceous, some very fine-grained dark and brown minerals, clay and silt cement, 90% quartzose, friable.
- 1234-1241 Graywacke, " 80% quartzose, little less friable.
- 1241-1247 Shale, medium gray (N5), micaceous.
- 1247-1252 Shale, " , silty.
- 1252-1258 Shale, carbonaceous, dark gray (N3), slightly silty, micaceous.
- 1258-1269 Coal, part thinly laminated and shaly, part high luster with conchoidal fracture.
- 1269-1280 Shale, slightly silty to non-silty, medium gray (N5), micaceous to finely micaceous, 25%; siltstone, shaly, medium light gray (N6), micaceous, 50%; graywacke, very light gray (N8), very fine-grained, subangular to subrounded, moderately well sorted, slightly micaceous, some dark mineral inclusions, about 80% quartzoses, 25%.

Interval

- 1280-1287 Graywacke, as in sample 1269-80, 65% quartzose, 50%; coal, blocky, part with a very high luster, 50%.
- 1287-1298 Graywacke, ver light gray (N7.5). "
- 1298-1304 Graywacke, very light gray (N7.5), subangular, poorly sorted, clay and silt cement, slightly micaceous, (muscovite?), brown, dark, green, black minerals, trace pyrite, about 40% quartzose, moderately friable.
- 1304-1311 Graywacke, " , 50% quartzose.
- 1311-1318 Graywacke, poorer sorting, few medium-grained, light gray flakes, micaceous (muscovite) and other minerals, also, reddish minerals, about 40% quartzose.
- 1318-1325 Graywacke, " little or partly calcareous cement.
- 1325-1333 Graywacke, " slight trace calcareous cement.
- 1333-1339 Graywacke, " very fine-grained, predominantly black and some green and brown minerals, non-calcareous.
- 1339-1349 Graywacke, " very fine-grained, sorting little better, very few medium-grained, slightly calcareous cement.
- 1349-1353 Graywacke, " " "
- 1353-1363 Shale, light brownish gray (5YR 6/1), very finely micaceous.
- 1363-1373 Shale, silty, medium gray (N5), finely micaceous.
- 1373-1383 Shale, carbonaceous, dark gray (N3), part slightly micaceous, 80%; coal, partly shaly, 20%.
- 1383-1393 Siltstone, slightly shaly, light gray (N7), slightly micaceous, some pan-pointing of black mineral.
- 1393-1402 Graywacke, very light gray, very fine-grained, subangular, to subrounded, poorly sorted, slightly micaceous, some fine-grained dark black, brown, and green minerals, clay and silt cement, about 65% quartzose, moderately friable.
- 1402-1407 Graywacke approaching quartzose sandstone, white (N9), fine-grained, subangular to subrounded, poorly sorted, slightly micaceous, few finely clastic minerals, 90% quartzose, some iron staining, silt and clay cement friable.

Interval

1407-1413	Graywacke, same as sample 1402-07.
1413-1417	Graywacke, " " "
1417-1421	Graywacke, very light gray (N8), fine-grained, subrounded to subangular, poorly sorted, slightly micaceous, silt to fine-grained black and brown minerals, iron staining, about 85% quartzose, moderately friable.
1421-1424	Graywacke, " " , friable.
1424-1428	Graywacke, white (N9), very fine-grained, subrounded, few subangular, trace calcareous cement, little iron staining, 90% quartzose.
1428-1432	Graywacke, " calcareous cement, more micaceous.
1432-1435	Graywacke, " slightly calcareous cement, 80% quartzose.
1435-1439	Graywacke, " " "
1439-1444	Graywacke, " " "
1444-1450	Graywacke, " trace calcareous cement, little iron staining.
1450-1455	Graywacke, very light gray (N8), very fine-grained, subangular to subrounded, poorly sorted, finely micaceous, clay cement, 80% quartzose, moderately well cemented.
1455-1463	Graywacke, " " "
1463-1469	Shale, medium gray (N5), very finely micaceous material, part with nodules 1/4 mm.
1469-1475	Shale, " " " "
1475-1484	Shale, dark gray (N3), partly carbonaceous; coal, laminated, partly shaly, 20%.
1484-1492	Shale, medium gray (N5), finely micaceous.
1492-1501	Shale, " slightly silty.
1501-1508	Graywacke, light gray (N7), fine-grained, very poorly sorted, subangular, micaceous, brown, green and black, minerals, clay cement, 75% quartzose, moderately friable.
1508-1513	Graywacke, " " "
1513-1517	Graywacke, " " "

Interval

1517-1522	Graywacke, " White, angular to subangular, approaching medium-grained, friable.
1522-1527	Graywacke, " "
1527-1534	Graywacke, few coarse grains, angular, apparantly broken quartz pieces (conglomerate?).
1534-1543	Siltstone, shaly, medium light gray (N6), micaceous.
1543-1553	Shale, medium gray (N5), usually finally micaceous.
1553-1563	Shale, " "
1563-1572	Shale, carbonaceous, dark gray (N3), part finely laminated, 85%; coal, part shaly, part high luster, 15%.
1572-1581	Siltstone, medium gray (N5), coarse-grained, poorly sorted, subangular to subrounded, clay cement, micaceous, 20%; graywacke, light gray (N7), very fine-grained, poorly sorted, subangular, with some angular to subrounded, micaceous, poorly sorted black, brown, and some green minerals, about 85% quartzose.
1581-1590	Graywacke, very light gray, fine-grained, poorly sorted, subangular, micaceous, poorly sorted black, brown, reddish, and green minerals, clay cement, about 75% quartzose, moderately friable.
1590-1594	Graywacke, " some with partly calcareous cement.
1594-1602	Graywacke, " very poorly sorted, subangular to angular, 70% quartzose.
1602-1609	Graywacke, " "
1609-1618	Graywacke, " approaching medium-grained, slightly calcareous cement.
1618-1627	Graywacke, fine-grained.
1627-1637	Graywacke, fine-grained approaching medium-grained.
1637-1647	Shale, medium gray (N5), finely micaceous, 80%; shale, carbonaceous, dark gray (N3), 20%.
1647-1652	Coal, high luster, some blocky, 20%; shale, carbonaceous, dark gray (N3), 80%.
1652-1658	Shale, silty, to very silty, brownish gray (5YR 4/1), finely micaceous.

Interval

1658-1668	Shale, same as sample 1652-58.
1668-1680	Shale, " "
1680-1692	Shale, medium gray (N5), partly slightly silty, very finely micaceous.
1692-1700	Shale, carbonaceous, medium dark gray (N4) to dark gray (N3), very finely micaceous, 50%; coal, high luster, 50%.
1700-1706	Coal, high luster, conchoidal fracture, 75%; siltstone, medium light gray (N6), coarse-grained, micaceous, slightly peppered with a black mineral, 25%.
1706-1717	Shale, medium gray (N5), finely micaceous.
1717-1734	Shale, medium dark gray (N4), trace fine micaceous matter.
1734-1742	Shale, " "
1742-1750	Shale, " "
1750-1760	Siltstone, medium light gray (N6), medium-grained; slightly peppered with a black mineral.
1760-1767	Graywacke, light gray (N5-6), fine-grained, poorly sorted, subangular to angular, micaceous, numerous brown, green and some black minerals, clay cement, slight trace calcareous cement, about 70% quartzose.
1767-1777	Graywacke, " "
1777-1787	Shale, silty, medium dark gray (N4), micaceous.
1787-1800	Shale, " "
1800-1810	Graywacke, light gray (N7), very fine-grained, subangular to subrounded, poorly sorted, slightly micaceous, numerous brown and dark minerals with some green, about 80% quartzose, clay cement with some slightly calcareous cement, moderately friable.
1810-1819	Graywacke, " " "
1819-1825	Graywacke, very light gray (N8), with some iron staining.
1825-1830	Graywacke, " "
1830-1835	Shale, medium dark gray (N4), micaceous.
1835-1842	Graywacke, very light gray (N8), very fine-grained, subangular, poorly sorted, slightly micaceous, dark

Interval

- and black minerals with shale particles, about 85% quartzose, clay cement, iron staining, friable.
- 1842-1847 Graywacke, " very light gray to white (N8-9), 90% quartzose.
- 1847-1850 Graywacke, " very poorly sorted, numerous medium-grained white chert fragments.
- 1850-1856 Graywacke, " approaching fine-grained with some reddish grains.
- 1856-1861 Graywacke, " fine-grained approaching medium-grained, slightly less friable.
- 1861-1866 Graywacke, " with some very coarse-grained bluish angular chert fragments, larger flakes of mica (muscovite?), conglomerate?
- 1866-1871 Graywacke " with some coarse-grained quartz fragments.
- 1871-1877 Graywacke, " white (N9), fine-grained, medium-grained angular pieces.
- 1877-1882 Graywacke, " " " "
- 1883-1887 Coal, high luster.
- 1887-1893 Coal, little shaly.
- 1893-1900 Graywacke, light gray (N7), very fine-grained, sub-angular, poorly sorted, alightly micaceous, dark green and black particles, clay cement, 60% quartzose, moderately friable.
- 1900-1907 Graywacke, " " " "
- 1907-1917 Graywacke, friable.
- 1917-1927 Graywacke, very light gray (N8), fine-grained, angular to subangular, poorly sorted, numerous medium-grained angular quartz fragments, brown and green and dark minerals, also dark shales, clay cement, 85% quartzose friable.
- 1927-1937 Graywacke, " medium-grained, 70% quartzose.
- 1937-1950 Siltstone, light gray (N7), ~~coarse to medium-grained~~, subrounded, medium well sorted, slightly micaceous, peppered with black mineral, slightly calcareous cement, moderatley well cemented.
- 1950-1958 Shale, medium gray (N5), very finely micaceous.

Interval

1958-1967	Shale, same as sample 1950-58.
1967-1975	Shale, medium brownish gray (5YR 5/1), trace finely micaceous, material.
1975-1985	Shale, silty, medium light gray (N6), finely micaceous.
1985-1995	Shale, medium gray (N5), partly slightly silty, finely micaceous.
1995-2000	Shale, silty, slightly calcareous, medium gray (N5), finely micaceous.
2000-2009	Shale, brownish gray (5YR 4/1), calcareous to some non-calcareous.
2009-2017	Limestone, medium finely crystalline to finely clastic, medium light gray (N6).
2017-2026	Shale, slightly calcareous, grayish red (10R 4/2), and shale, slightly calcareous, dark greenish gray (5GY 4/1).
2026-2031	Shale, and medium-grained silty calcareous shale.
2031-2041	Shale, grayish red (10R 4/2), finely laminated, trace very finely micaceous material.
2041-2048	Shale; trace brownish gray (5YR 4/1), finely clastic limestone.
2050-2055	Shale, calcareous, " "
2055-2060	Shale, silty, medium gray (N5), 25%; siltstone, dark greenish gray (5CY 4/1), fine to medium-grained, finely micaceous, 25%; siltstone, calcareous, greenish gray (5GY 6/1), coarse-grained, finely micaceous, 50%.
2060-2065	Siltstone, light greenish gray (5GY 8/1), "
2065-2069	Siltstone, " to very light gray (N8).
2074-2083	Shale, silty to slightly silty, medium gray (N5).
2083-2090	Shale, medium brownish gray (5YR 5/1), very finely micaceous.
2090-2097	Shale, medium gray (N5), very finely micaceous.
2097-2104	Shale, silty, medium gray (N5).

Interval

2104-2110	Graywacke, very light gray (N8), very fine-grained, subangular to subrounded, poorly sorted, moderately well sorted with clay and silt cement, slightly micaceous, poorly sorted, dark and brown particles, 90% quartzose, moderately friable.
2110-2115	Graywacke, very light gray (N8.5), friable, iron shaining.
2115-2121	Graywacke, " " "
2121-2128	Graywacke, " " "
2128-2132	Shale, medium gray (N5) partly carbonaceous, micaceous.
2132-2139	Siltstone, medium light gray (N6), coarse-grained, subangular, clay cement, moderately well cemented, slightly micaceous, peppered with dark and black minerals, trace coal.
2139-2144	Graywacke, very light gray (N8), very fine-grained, subrounded, moderately well sorted with clay cement, slightly micaceous, peppered with dark and black minerals, friable.
2144-2149	Graywacke, " " "
2149-2154	Graywacke, " " "
2154-2159	Graywacke, very light gray (N8), very fine-grained, micaceous (muscovite), slightly peppered with dark and black very fine-grained material, calcareous cement, 85% quartzose, 60%; siltstone, medium light gray (N6), coarse-grained, medium well cemented, clay cement, micaceous, 40%; crystals of calcite.
2159-2163	Shale, medium dark gray (N4), slightly silty, micaceous, slightly fissile.
2163-2169	Siltstone, medium light gray (N6), very well cemented, siliceous ? cement, slightly peppered with black mineral.
2169-2174	Graywacke, very light gray (N8), very fine-grained, subrounded to subangular, moderately well sorted, slightly peppered with dark and black material, some red inclusions, micaceous, clay and slightly calcareous cement, friable, 85% quartzose.
2174-2180	Graywacke, " approaching siltstone.
2180-2185	" Very fine-grained.

Interval

2189-2192	Graywacke, non-calcareous.
2192-2195	Graywacke, non-calcareous cement.
2195-2200	Shale, medium dark gray (N4), micaceous.
2200-2205	Graywacke, medium dark gray (N4), micaceous, as 2192-95.
2205-2212	Shale, silty to non-silty, medium dark gray (N4), slightly micaceous.
2212-2221	Shale, medium dark gray (N4), finely micaceous.
2221-2227	Siltstone, medium light gray (N6), coarse-grained, subrounded to subangular, well cemented, moderately calcareous cement, peppered with black and dark materials.
2227-2235	Shale, medium dark gray (N4), finely micaceous. Trace grayish red shale, very finely micaceous.
2235-2243	Shale, " " "
2243-2250	Shale, medium light gray (N6), very finely micaceous, little silty.
2250-2256	Siltstone, slightly calcareous, medium light gray (N6), coarse-grained, with cemented.
2256-2265	Shale, silty, medium light gray (N6), very slightly calcareous.
2265-2275	Shale, " non-silty, to slightly silty.
2275-2287	Shale, medium dark gray (N4), non-micaceous to trace of very finely micaceous material; coal, high luster, 10%.
2287-2293	Shale, medium dark gray (N4), trace very finely micaceous material.
2293-2300	Shale, " "
2300-2310	Shale, calcareous, medium light gray (N6.5), finely micaceous.
2310-2320	Shale, " "
2320-2326	Shale, slightly calcareous, medium gray (N5), partly sandy and very calcareous, slightly micaceous.
2326-2336	Shale, medium dark gray (N4).
2336-2345	Shale, " finely laminated.

Interval

2345-2354	Shale, trace of pyrite.
2354-2362	Shale, "
2362-2371	Shale, medium gray (N5), trace finely micaceous material.
2371-2380	Graywacke, medium light gray (N6), very fine-grained, subangular to subrounded, moderately well sorted, clay cement, moderately well cemented, peppered with dark material, trace calcareous material, 50% quartzose, little porosity.
2380-2387	Graywacke, " "
2387-2394	Graywacke, " poorly sorted, pieces with calcite crystals.
2394-2404	Shale, medium gray (N5), streak of light olive gray (N5Y 6/1), very finely clastic to very finely crystalline limestone.
2404-2414	Graywacke, " medium light gray as 2371-2394, calcareous cement.
2414-2425	Shale, very slightly calcareous, medium light gray (N6).
2425-2432	Limestone, light olive gray (5Y 6/1), light gray (N7), medium light gray (N6), finely clastic and trace of very light gray (N8), calcite.
2432-2435	Graywacke, very light gray (N8), very fine-grained, subangular to subrounded, medium well sorted, clay and calcareous cement, some very fine-grained dark and black material included, 90% quartzose, well cemented.
2435-2452	Graywacke, " more friable.
2452-2456	Graywacke, "
2456-2459	Graywacke, well cemented, slightly calcareous cement.
2459-2464	Graywacke, slightly micaceous, considerable iron staining.
2464-2467	Graywacke, " "
2467-2472	Graywacke, non-calcareous, moderately friable.
2472-2475	Graywacke, very slightly calcareous.
2475-2478	Graywacke, "
2478-2485	Graywacke, very light gray to white (N8-9), moderately well cemented.

Interval

2485-2487	Graywacke, non-calcareous.
2487-2490	Graywacke, "
2490-2493	Graywacke, "
2493-2497	Graywacke, trace calcareous material.
2497-2500	Graywacke, "
2500-2502	Graywacke, " very fine-grained to fine-grained, poorly sorted.
2502-2506	Graywacke, " , slightly calcareous.
2506-2510	Graywacke, " , " , trace red material.
2510-2513	Graywacke, " "
2513-2516	No sample.
2516-2521	Graywacke, very fine-grained, more peppered with dark and red material, partly well cemented.
2521-2527	Graywacke, moderately well sorted with considerable silt size.
2526-2530	Shale, medium dark gray (N4), micaceous, partly silty.
2530-2533	Graywacke, very light gray (N 8.5), very fine-grained, subangular to subrounded, moderately well sorted, with considerable silt size, well cemented, clay cement and considerable calcareous particles, few irregular shaped black particles.
2433-2538	Graywacke, slightly calcareous.
2538-2541	Graywacke, "
2541-2544	Graywacke, "
2544-2560	No sample.
2560-2567	Graywacke, slightly calcareous.
2567-2571	Graywacke, very light gray to white.
2571-2575	Graywacke, calcareous.
2575-2580	No sample.

Interval

- 2580-2585 Shale, calcareous, medium dark gray (N4), slightly micaceous, 80%; limestone, medium dark gray, some light gray (N7), mottled with light gray, clastic to finely crystalline with some coarsely crystalline calcite, fragments of megafossils.
- 2585-2592 Limestone, " , fossiliferous; macrofragments, ostracods and crinoids.
- 2592-2603 Shale, calcareous, medium dark gray (N4), slightly micaceous, part slightly fossiliferous.
- 2603-2611 Limestone, medium gray (N5), mottled with light gray, finely clastic and some finely crystalline, slightly fossiliferous, crinoids and few fragments.
- 2611-2620 Limestone, shaly, medium gray (N5), very finely clastic with some very finely crystalline.
- 2620-2631 Limestone, " "
- 2631-2638 Limestone, " "
- 2638-2645 Limestone, with possible lense of light gray finely clastic soft limestone,
- 2645-2655 Shale, green (10R 5/4), finely micaceous, few dark gray nodules.
- 2655-2670 Shale, silty to sandy, grayish red, micaceous, slight trace calcareous.
- 2670-2682 Shale, grayish red, finely micaceous.
- 2682-2692 Shale, grayish red (5R 4/2), very finely micaceous.
- 2692-2702 Shale, greenish gray (5 G 6/1), very finely micaceous.
- 2702-2713 Shale, medium light gray (N6), very finely micaceous.
- 2713-2720 Shale, very slightly silty, medium gray (N5), finely micaceous.
- 2720-2725 Graywacke, medium gray (N5), very fine-grained, subangular to subrounded, moderately well sorted, micaceous (muscovite), considerable black, dark and reddish very fine-grained particles, clay cement, well cemented, 50% quartzose, 80%; graywacke, very light gray (N8), fine-grained, subangular, very poorly sorted, micaceous, (Muscovite), numerous poorly sorted green and black minerals and materials, calcareous cement, 70% quartzose, moderately well cemented, 20%

Interval

2725-2733	Graywacke, " very light gray, slightly calcareous, moderately friable.
2733-2738	Graywacke, " "
2738-2743	Graywacke, " subangular to subrounded.
2743-2748	Graywacke, friable.
2748-2753	Graywacke, " to some non-calcareous.
2753-2759	Shale, calcareous, slity, medium brounish gray (5YR 5/1), micaceous, 90%; limestone, moderatelbrown (5YR 4/4), and dark yellow brown (10YR 4/2), very finely clastic, 10%.
2759-2768	Limestone, slightly shaly, medium light gray (N6), very finely clastic to some very finely crystalline, 50%; shale, calcareous to slightly calcareous, medium gray (N5), 50%.
2768-2773	Shale, slightly to very slightly calcareous, grayish red (5R 4/2), finely micaceous.
2773-2780	Shale, " "
2780-2786	Shale, slightly calcareous, medium light gray (N6), trace of very finely micaceous material.
2786-2954	No sample.
2954-2958	Graywacke, very light gray (N 8.5), very fine-grained, subangular, moderately well sorted, slightly micaceous, slightly peppered with black and dark material, clay cement with trace of calcareous, 90% quartzose. About 40% medium gray shale.

Samples run by Elosie Jacobsen,
Geologist, U. S. Geological Survey,
Lexington, Kentucky
October, 1949

UNITED PRODUCING COMPANY

Yukon-Pocahontas Coal Company

Number: 2-1466.

Topographic Location: 260' South of 37° 10'; 13,700' East of 82° 05',
Hurricane District, Bucu Quadrangle, Buchanan
County, Virginia.

Elevation: 1751' (ground).

Interval

- 2786-2895 Shale, grayish red (5R 4/2), silty, micaceous; and siltstone, grayish red (5R 4/2), micaceous, slightly calcareous.
- 2795-2800 Shale, and siltstone, medium dark gray (N4), with greenish tint, micaceous, slightly calcareous.
- 2800-2812 Samples as 2786-2795.
- 2812-2822 Sample as 2800-2812 with some siltstone, medium dark gray (N4), with greenish tint, calcareous.
- 2822-2827 Siltstone, medium gray (N5), to medium dark gray (N4), with greenish tint, micaceous, calcareous and small amount of limestone, light olive gray, (5Y 6/1), silty, dense.
- 2827-2833 Shale, medium dark gray (N4), silty, micaceous, calcareous locally.
- 2833-2841 Sample as 2827-2833, but all calcareous.
- 2841-2851 Shale, grayish red, (5R 3/2), finely micaceous; and shale, light brownish gray, (5YR 6/1), calcareous.
- 2851-2856 Shale, grayish red as 2841-2851; and medium dark gray (N4), with greenish tint, silty, micaceous, calcareous.
- 2856-2866 Shale, grayish red as 2841-2851; and dark greenish gray, (5GY 4/1), calcareous.
- 2866-2880 Shale, medium dark gray (N4), finely micaceous.
- 2880-2890 Shale, medium dark gray (N4) to dark gray (N3), fissile, calcareous.
- 2890-2900 Shale, as 2866-2880; and small amount of sandstone, medium gray (N5), with greenish tint, subangular, poorly sorted, very silty, 50% quartzose, very fine-grained.
- 2900-2908 Siltstone, medium dark gray (N4), finely micaceous; and sandstone as 2890-2900.

Interval

- 2908@2916 Shale, medium dark gray (N4) to dark gray (N3), silty, micaceous; and siltstone, light gray (N8), very sandy, slightly calcareous.
- 2916-2921 Sandstone, light gray (N7), with slight greenish tint, fine-grained, subangular, poorly sorted, very slightly porous, silty, slightly calcareous, 3/4 quartzose.
- 2921-2931 Shale, medium dark gray (N4), silty, calcareous locally.
- 2931-2941 Shale, medium dark gray (N4), silty, micaceous, calcareous; and shale, medium gray (N5), calcareous.
- 2941-2947 Sample as 2931-2941.
- 2947-2954 Sample as 2931-2941.
- 2954-2966 Sandstone, very light gray (N8), very fine-grained, angular to subangular, fairly well sorted, slight porosity, silty, 70% quartzose.
- 2966-2979 Shale, medium dark gray (N4), slightly calcareous.
- 2976-2991 Sample as 2966-2976.
- 2991-3002 Shale, dark gray (N3), fissile, non-calcareous; and sandstone, light gray (N7), with greenish tint, very fine-grained, subangular, well sorted, slight porosity, small amount of green mineral, 90% quartzose.
- 3002-3016 Shale, medium dark gray (N4), silty, calcareous.
- 3016-3024 Sample as 3002-3016.
- 3024-3030 Shale, dark gray (N3), fissile, few tabular cuttings.
- 3030-3035 Sandstone, white (9), very fine-grained, subangular, fairly well sorted, silty, scattered black mineral, small amount of pyrite, 90% quartzose.
- 3035-3043 Sample as 3030-3035.
- 3043@3049 Sample as 3035-3043.
- 3049-3056 Sample as 3043-3049.
- 3056-3062 Sandstone, white (N9), very fine-grained, subangular, well sorted, slightly calcareous, 95% quartzose.
- 3062-3068 Sample as 3056-3062.
- 3068-3079 Shale, medium dark gray (N4), silty, to dark gray (N3), fissile, carbonaceous, abundant pyrite.

Interval

3079-3085 Sandstone, white, fine-grained, subangular, well sorted, slight porosity, scattered black mineral, 90% quartzose.

3085-3086 Sample as 3079-3085.

3086-3089 Sandstone, white, very fine-grained to fine-grained, angular to subangular, well sorted, very slight porosity, slightly silty, 90% quartzose.

3089-3091 Sample as 3085-3086.

3091-3094 Sample as 3086-3089.

3094-3098 Sample as 3091-3094.

3098-3100 Sample as 3094-3098.

3100-3102 Sample as 3098-3100.

3102-3105 Sample as 3100-3102.

3105-3109 Sample as 3102-3105.

3109-3112 Siltstone, medium dark gray, sandy to argillaceous.

3112-3117 Sample as 3109-3112.

3117-3121 Sample as 3112-3117.

3121-3130 Sample as 3117-3121.

3130-3140 Sample as 3121-3130.

3140-3145 Sample as 3130-3140.

3145-3149 Sandstone, very light gray (N8), very fine-grained to fine-grained, subangular, well sorted, slight porosity, 95% quartzose.

3149-3152 Sandstone, very light gray (N8), very fine-grained, subangular, fairly well sorted, very slightly porous, silty, calcareous, 90% quartzose.

3152-3154 Sandstone, white (N9), subangular, well sorted, slightly porous, 95% quartzose.

3154-3160 Sample as 3152-3154.

3160-3162 Sample as 3154-3160, very bit-stained.

3160-3165 Sandstone, white, (N9), very fine-grained, subangular, well sorted, slightly porous, 95% quartzose.

Interval

- 3165-3170 Sample as 3160-3162.
- 3170-3176 Sandstone, white (N9), very fine-grained to fine-grained, subangular to subrounded, poorly sorted, slightly porous, silty, 90% quartzose; bit stained.
- 3176-3181 Sample as 3170-3176.
- 3181-3186 Sandstone, very light gray (N8), very fine-grained to fine-grained, subangular, poorly sorted, silty, slightly calcareous, scattered black mineral, about 90% quartzose.
- 3186-3190 Sample as 3181-3186.
- 3190-3200 Sandstone, white (N9), fine-grained, subangular, well sorted, slightly porous, slightly silty, scattered black mineral, 96% quartzose.
- 3200-3207 Sample as 3190-3200.
- 3207-3210 Sample as 3200-3207.
- 3210-3215 Sample as 3207-3210.
- 3215-3220 Siltstone, medium light gray (N6), sandy to medium dark gray (N4), argillaceous, micaceous.
- 3220-3230 Sandstone, very light gray (N8), very fine-grained, subangular, fairly well sorted, very slightly porous, slightly silty, 90% quartzose.
- 3230-3231 Siltstone, medium gray (N5) to medium dark gray (N4), sandy, micaceous.
- 3231-3235 Sandstone, white (N9), very fine-grained to fine-grained, subangular, well sorted, slightly porous, slightly calcareous, 95% quartzose, bit stained.
- 3235-3240 Shale, medium gray (N5), to medium dark gray (N4), fairly fissile.
- 3240-3246 Sample as 3235-3240.
- 3246-3258 Sandstone, medium dark gray (N4), very fine-grained to fine-grained, subangular, poorly sorted, slightly porous, silty, micaceous, and carbonaceous locally, 90% quartzose.
- 3258-3268 Shale, medium dark gray (N4), silty; to dark gray (N3), some carbonaceous.
- 3268-3278 Sample as 3258-3268 with abundant pyrite.
- 3278-3288 Siltstone, medium dark gray (N4), micaceous.

Interval

- 3288-3291 Sandstone, very light gray (N8), very fine-grained, angular to subangular, poorly sorted, slightly porous, very silty, 90% quartzose, and shale, dark gray (N3).
- 3291-3300 Siltstone, medium gray (N5), sandy, micaceous, abundant pyrite.
- 3300-3304 Sandstone, white (N9), very fine-grained, subangular, well sorted, slightly porous, 95% quartzose.
- 3304-3308 Sample as 3300-3304.
- 3308-3312 Siltstone, medium dark gray (N4), sandy, with scattered mica.
- 3312-3320 Sample as 3308-3312 with small amount of dark gray (N3), silty shale.
- 3320-3330 Shale, medium dark gray (N4), fissile.
- 3330-3340 Sample as 3320-3330.
- 3340-3347 Shale, medium dark gray (N4), calcareous, lumpy.
- 3347-3357 Sample as 3340-3347.
- 3357-3370 Sample as 3347-3357.
- 3370-3380 Shale, medium dark gray (N4), lumpy, calcareous, and fissile, non-calcareous.
- 3380-3390 Sample as 3370-3380, with scattered pyrite.
- 3390-3400 Sample as 3357-3370.
- 3400-3410 Siltstone, medium dark gray (N4), calcareous, with partings of medium gray (N4), silty limestone.
- 3410-3417 Sandstone, very light gray (N8), fine-grained, subangular, fairly well sorted, slightly porous, slightly silty, slightly calcareous, 90% quartzose.
- 3417-3423 Sandstone, medium light gray (N6), fine-grained, subangular, poorly sorted, slightly porous, silty, micaceous, scattered black mineral, 3/4 quartzose.
- 3423-3427 No sample.
- 3427-3437 Sample as 3417-3423; and shale, medium dark gray (N4), fissile, calcareous.
- 3437-3448 Sandstone, white (N9), very fine-grained, subangular, well sorted, slightly porous, 95% quartzose of medium gray (N5), very fine-grained, subangular, poorly sorted, argillaceous, with abundant pyrite, 3/4 quartzose.

Interval

- 3448-3458 No sample.
- 3458-3465 Sandstone, light gray (N7), very fine-grained, subangular, fairly well sorted, slightly porous, silty, 90% quartzose.
- 3465-3475 Shale, medium dark gray (N4), non-calcareous.
- 3475-3485 Sample as 3465-3475.
- 3485-3495 Siltstone, medium dark gray (N4), argillaceous, with scattered mica.
- 3495-3502 Shale, medium dark gray (N4), as 3465-3475.
- 3502-3512 Ditto. Like 3495-3502.
- 3512-3522 Ditto. Like 3502-3512.
- 3522-3529 Ditto, and sandstone, light gray (N7), very fine-grained, subangular, poorly sorted, silty, 90% quartzose.
- 3529-3536 Sample as 3522-3529 with interbedded limestone, medium gray (N5), medium crystalline, silty.
- 3536-3546 Sample as 3529-3536.
- 3546-3556 Shale, medium dark gray (N4), calcareous, crinoidal.
- 3556-3561 Sample as 3546-3556.
- 3561-3568 Shale, medium dark gray (N4), silty, micaceous, slightly calcareous; and limestone light gray (N7), to medium gray (N5), dense to medium crystalline, silty, fossiliferous (brachiopod fragments).
- 3568-3574 Like 3561-3568.
- 3574-3580 Like 3568-3574.
- 3580-3585 Limestone, white (N9), to brownish gray (5YR 4/1), non-crystalline to medium crystalline, oolitic, silty.
- 3585-3592 Limestone, medium dark gray (N4), oolitic, silty.
- 3592-3600 Limestone, medium dark gray (N4), very oolitic, non-crystalline.
- 3600-3608 Limestone, white (N9), medium crystalline to medium dark gray (N4), silty, very finely crystalline.
- 3608-3614 Limestone, medium dark gray (N4), to dark gray (N3), oolitic, dense to medium crystalline, silty.

Interval

3614-3620	Like 3608-3614.
3620-3625	Limestone, white (N9), to dark gray (N3), slightly oolitic, dense, silty.
3625-3630	Like 3620-3625.
3630-3635	Like 3625-3630.
3635-3642	Limestone, medium dark gray (N4), slightly oolitic, composed largely of crinoid and brachiopod fragments, silty.
3642-3650	Limestone, light brownish gray (5YR 6/1), medium crystalline, to dark gray (N3), dense to non-crystalline, oolitic, crinoidal.
3650-3658	Like 3635-3642.
3658-3666	Like 3650-3666.
3666-3676	Like 3658-3666.
3676-3686	Shale, medium dark gray (N4), calcareous, fossiliferous.
3686-3696.	Like 3666-3676.
3696-3704	Like 3686-3696.
3704-3710	Like 3696-3704.
3710-3715	Like 3704-3710.
3715-3720	Like 3710-3715 with some limestone, medium dark gray (N4), silty.
3720-3727	Limestone, medium light gray (N6), to medium dark gray (N4), oolitic, non-crystalline to dense, silty.
3727-3735	Limestone, white (N9), to medium dark gray (N4), finely crystalline to medium crystalline, silty.
3735-3743	Like 3737-3735.
3743-3751	Like 3710-3715.
3751-3760	Shale, like 3743-3751, with a small amount of limestone, medium dark gray (N4), dense, silty.
3760-3770	Like 3743-3751.
3770-3780	Like 3760-3770.
3780-3790	Like 3770-3780.

Spot ekhs.

Interval

3790-3800	Limestone, light gray (N7), and medium dark gray (N4), mottled, dense to medium crystalline, silty.
3800-3808	Like 3790-3800.
3808-3816	Limestone, medium gray (N5), to medium dark gray (N4), dense, silty, nodular, with scattered pyrite crystals.
3816-3825	Limestone, white (N9), and medium dark gray (N4), dense.
3825-3840	Like 3816-3825.
3840-3847	Like 3825-3840.
3847-3855	Limestone, medium dark gray (N4), dense, silty.
3855-3860	Like 3847-3855.
3860-3865	Like 3855-3860.
3865-3870	Like 3860-3865 with some limestone, light gray (N7), non-crystalline, slightly oolitic.
3870-3878	Limestone, light gray (N7), to dark gray (N3), dense, slightly oolitic, with small amount of limestone, light brownish gray (5YR 6/1), medium crystalline.
3878-3887	Like 3870-3875.
3887-3892	Like 3878-3887, but not oolitic.
3892-3900	Like 3887-3892.
3900-3908	Like 3892-3900.
3908-3915	Limestone, dark gray (N3), argillaceous, with scattered pyrite crystals, crinoidal.
3915-3922-	Like 3900-3908.
3922-3927	Like 3900-3908.
3927-3932	Like 3922-3927.
3932-3938	Like 3927-3932.
3938-3948	Like 3932-3938.
3948-3958	Limestone, dark gray (N3), silty, fossiliferous (bryozoa.)
3958-3968	Limestone, very light gray (N8), non-crystalline, and medium dark gray (N4), silty, dense, crinoidal.

Interval

- 3968-3978 Limestone, white (N9), and medium dark gray (N4), dense, oolitic, scattered pyrite crystals.
- 3978-3986 Like 3968-3978.
- 3986-3990 Like 3978-3986.
- 3990-3998 Like 3986-3990.
- 3998-4005 Limestone, white (N9), non-crystalline to medium crystalline; and limestone, light brownish gray (5YR 6/1), dense, oolitic.
- 4005-4015 Like 3998-4005.
- 4015-4022 Like 4005-4015, crinoidal.
- 4002-4028 Limestone, white (N9), to brownish gray (5YR 4/1), non-crystalline to dense.
- 4028-4032 Limestone, light gray (N7), to medium dark gray (N4), non-crystalline to dense.
- 4032-4035 Limestone, brownish gray (5YR 4/1), dense.
- 4035-4038 Like 4028-4032.
- 4038-4048 Limestone, brownish gray (5YR 4/1), dense, with small amount of pyrite.
- 4048-4055 Limestone, white (N9), to brownish gray (5YR 5/1), dense to finely crystalline.
- 4055-4081 Like 4048-4055, with abundant medium crystals of dolomite (?).
- 4061-4067 Limestone, light brownish gray (5YR 6/1) dense, oolitic.
- 4067-4071 Like 4061-4067.
- 4071-4076 Like 4067-4071.
- 4076-4080 Like 4071-4076.
- 4080-4084 Limestone, light brownish gray (5YR 5/1), dense to finely crystalline.
- 4084-4092 Limestone, white (N9), to light brownish gray (5YR 5/1) dense.
- 4092-4097 Limestone, light brownish gray (5YR 6/1) to brownish gray (5YR 4/1) dense, oolitic.
- 4097-4102 Like 4092-4097.

Interval

- 4102-4107 Like 4097-4102.
- 4107-4113 Limestone, medium dark gray (N4), dense, slightly oolitic.
- 4113-4120 Limestone, medium dark gray (N4), with slightly brownish tint, silty, oolitic, dense with some medium crystals.
- 4120-4130 Like 4113-4120 with a few crinoid stems.
- 4130-4135 Limestone, light brownish gray (5YR 5/1) dense.
- 4135-4140 Like 4130-4135 with some limestone, light gray (N7), non-crystalline.
- 4140-4147 Like 4135-4140.
- 4147-4154] Like 4140-4147.
- 4154-4165 Limestone, brownish gray (5YR 4/1), dense, with fine grainy texture.
- 4165-4175 Like 4154-4175.
- 4175-4182 Limestone, light gray (N7), to brownish gray (5YR 4/1) dense, slightly fossiliferous (bryozoa fragments?).
- 4182-4190 Like 4175-4182.
- 4190-4195 Limestone, medium gray (N5), very abundant dark gray (N3) ooliths, with white (N9), medium crystalline to finely crystalline matrix.
- 4195-4198 Like 4190-4195.
- 4198-4206 Limestone, light gray (N7), to brownish gray (5YR 4/1) dense, slightly oolitic.
- 4206-4213 Like 4198-4206.
- 4213-4220 Like 4206-4213.
- 4220-4225 Limestone, medium dark gray (N4), with brownish tint, dense.
- 4225-4230 Limestone, very light gray (N8) non-crystalline to medium dark gray (N4), like 4220-4225.
- 4230-4235 Limestone, medium gray (N5), silty.
- 4235-4240 Like 4230-4235.
- 4240-4247 Limestone, medium dark gray (N4), dense, slightly silty; and very light gray (N8), non-crystalline.
- 4247-4255 Like 4240-4247, with some chert, light brownish gray (5YR 6/1), platy chips.

Interval

- 4255-4260 Like 4247-4255 with slightly more abundant chert.
- 4260-4265 Limestone, medium dark gray (N4), argillaceous, dense to finely crystalline.
- 4265-4270 Like 4260-4265.
- 4270-4276 Like 4265-4270.
- 4276-4281 Limestone, very light gray (N8), to medium dark gray (N4), dense to finely crystalline; and siltstone, medium light gray (N6), with slightly greenish tint, calcareous; also a few medium to coarse rounded quartz grains.
- 4281-4286 Limestone, brownish gray (5YR 4/1), dense.
- 4286-4295 Like 4281-4286.
- 4295-4302 Limestone, medium light gray (N6), to medium dark gray (N4), sandy.
- 4302-4309 Like 4295-4302.
- 4309-4316 Like 4302-4309.
- 4316-4323 Like 4309-4316.
- 4323-4329 Like 4316-4323 with trace of gypsum (?) (selenite).
- 4329-4333 Like 4316-4323, but silty.
- 4333-4350 Like 4329-4333.
- 4350-4376 Siltstone, medium dark gray (N4), calcareous.
- 4346-4350 Siltstone, medium gray (N5), with greenish tint, calcareous; trace gypsum.
- 4350-4355 Siltstone, medium gray (N5), like 4346-4350.
- 4355-4360 Like 4350-4355, with small amount of scattered bluish green mineral.
- 4360-4369 Siltstone, medium gray (N5), non-calcareous.
- 4369-4375 Like 4360-4369.
- 4375-4378 Like 4369-4375.
- 4378-4383 Like 4375-4378.
- 4383-4389 Siltstone, medium dark gray (N4), sandy, slightly calcareous, contains abundant bright green mineral.

Interval

4389-4392	Siltstone, medium light gray (N6), sandy, calcareous, slightly micaceous.
4392-4395	Like 4389-4392.
4395-4400	Like 4392-4395.
4400-4404	Like 4395-4400.
4404-4412	Like 4400-4404.
4412-4417	Siltstone, medium dark gray (N4), argillaceous, micaceous.
4417-4424	Siltstone, like 4412-4417; and shale, dark gray (N3).
4429-4434	Like 4404-4412.
4434-4439	Siltstone, medium gray (N5), sandy, micaceous, non-calcareous.
4439-4445	Like 4434-4439.
4445-4450	Like 4439-4445.
4450-4455	Like 4445-4450.
4455-4460	Like 4450-4460.
4460-4465	Shale, medium dark gray (N4), silty.
4465-4473	Like 4460-4465.
4473-4478	Siltstone, light gray (N7), very sandy, scattered micaceous.
4478-4483	Like 4473-4483.
4483-4488	Like 4478-4483.
4488-4496	Sandstone, medium dark gray (N4), conglomeratic, very fine-grained to coarse-grained, subangular to subrounded, very poorly sorted, slightly porous, argillaceous, slightly calcareous, 1/2 quartzose; and sandstone, medium gray (N5), with reddish tint due to red, micaceous, argillaceous interstitial material, medium-grained granules, subrounded to rounded, poorly sorted, calcareous, abundant argillaceous nodules, 3/4 quartzose. (grains frosted - Big Injun?). (No)
4496-4501	Sandstone, light gray (N7), very fine-grained to fine-grained, subangular, fairly well sorted, fairly porous, slightly silty, slightly calcareous, 90% quartzose.
4501-4504	Like 4496-4501.

Interval

- 4504-4509 ^{Like 4496-4501}
Siltstone, medium gray (N5), sandy, micaceous.
- 4509-4514 Like ~~4504-4509~~.
- 4514-4519 Like ~~4509-4514~~.
- 4519-4524 Like 4514-4519.
- 4524-4530 Siltstone, medium light gray (N6), sandy; and shale, medium dark gray (N4), silty, micaceous.
- 4530-4534 Sandstone, medium light gray (N6), very fine-grained, angular to subangular, very poorly sorted, slightly porous, very silty, slightly calcareous, scattered pyrite crystals, 1/2 quartzose.
- 4534-4540 Like 4530-4534.
- 4540-4545 Like 4534-4540.
- 4545-4550 Siltstone, medium gray (N5), sandy; and shale medium dark gray (N4).
- 4550-4555 Siltstone, medium gray (N5), sandy, slightly calcareous, with abundant pyrite; and shale, medium dark gray (N4), silty, micaceous.
- 4555-4560 Shale, medium dark gray (N4), silty, fissile, slightly micaceous.
- 4560-4565 Like 4555-4560.
- 4565-4570 Like 4560-4565.
- 4570-4575 Sandstone, medium light gray (N6), very fine-grained, angular, to subangular, fairly well sorted, very slightly porous, slightly silty, 90% quartzose.
- 4575-4585 Shale, medium gray (N5), to medium dark gray (N4), silty with scattered clusters of pyrite crystals.
- 4585-4590 Siltstone, medium light gray (N6), sandy, with scattered pyrite crystals; and shale, medium dark gray (N4), silty, micaceous.
- 4590-4595 Shale, medium dark gray (N4), like 4585-4590.
- 4595-4600 Like 4585-4590.
- 4600-4605 Sandstone, light gray (N7), very fine-grained to fine-grained, subangular, poorly sorted, very slightly porous, silty, calcareous, abundant pyrite, 3/4 quartzose.
- 4605-4610 Sandstone, like 4600-4605; siltstone, medium gray (N5), pyritic; and shale, medium dark gray (N4), slightly silty, fairly fissile.

Interval

4610-4615	Like 4605-4610.
4615-4620.	Like 4610-4615.
4620-4625	Like 3615-4620.
4625-4635	Shale, medium dark gray (N4), with abundant clusters of pyrite crystals.
4635-4645	Like 4625-4635.
4645-4655	Like 4635-4640 with some siltstone, medium dark gray (N4), sandy.
4655-4665	Like 4645-4655.
4665-4673	Like 4655-4665.
4675-4785	Shale, medium dark gray (N4), silty.
4685-4690	Shale, medium dark gray (N4), fissile with few clusters of pyrite crystals.
4690-4700	Like 4685-4690.
4700-4709	Like 4690-4700.
4709-4719	Like 4700-4709.
4719-4725	Like 4709-4719.
4725-4733	Like 4719-4725.
4733-4750	Like 4733-4742.
4750-4757	Shale, medium dark gray (N4), with slight brownish tint, lumpy.
4757-4764	Shale, like 4750-4757, and shale like 4757-4764.
4764-4771	Like 4757-4764.
4771-4779	Like 4764-4771 with abundant pyrite.
4779-4788	Like 4764-4771 with scattered marcasite crystals.
4788-4797	Shale, medium dark gray (N4), fairly fissile, fairly micaceous; and siltstone, medium gray (N5).
4797-4805)	Shale, medium dark gray (N4), fairly fissile; and shale, medium dark gray (N4); with brownish tint, silty.

Interval

- 4805-4815 Shale, medium dark gray (N4), fissile, slightly micaceous.
- 4815-4826 Like 4805-4815.
- 4826-4843 Like 4815-4826.
- 4843-4850 Siltstone, medium gray (N5), sandy, micaceous.
- 4850-4860 Shale, medium dark gray (N4), silty.
- 4860-4870 Shale, medium dark gray (N4), fissile.
- 4870-4880 Shale, medium dark gray (N4), silty, slightly micaceous.
- 4880-4890 Like 4860-4870.
- 4890-4900 Like 4880-4890.
- 4900-4911 Like 4890-4900.
- 4911-4922 Like 4900-4911.
- 4922-4932 Shale, medium dark gray (N4), slightly silty; and siltstone, medium gray (N5) to medium dark gray (N4) sandy, with scattered marcasite (?) crystals.
- 4932-4938 Like 4922-4932.
- 4938-4948 Like 4922-4932.
- 4948-4959 Siltstone, medium dark gray (N4), sandy to argillaceous, fairly micaceous, abundant pyrite crystals.
- 4959-4969 Siltstone, like 4948-4959; and sandstone, medium light gray (N6), to medium gray (N5), very fine-grained, angular to subangular, poorly sorted, very slightly porous, very silty, slightly calcareous, micaceous, scattered pyrite crystals, 50% quartzose.
- 4969-4976 Sandstone, like 4959-4969; ^{lyst shales 13T} shale, medium dark gray (N4), fissile; and shale, dark gray (N3), carbonaceous, locally calcareous and fossiliferous.
- 4976-4981 Siltstone, medium gray (N5), micaceous; and little limestone, medium dark gray (N4), silty, dense.
- 4981-4991 Shale, medium dark gray (N4), fissile; and small amount of limestone, light brownish gray (5YR 6/1) dense.
- 4981-5000 Shale, medium dark gray (N4), fissile.
- 5000-5010 Like 4991-5000.

Interval

- 5010-5032 Siltstone, medium light gray (N6), sandy; to medium gray (N5) micaceous, argillaceous.
- 5032-5040 Like 5010-5032 with a small amount of finely crystalline to medium crystalline dolomite.
- 5040-5050 Siltstone, medium gray (N5), slightly sandy, micaceous; to medium dark gray (N4), argillaceous; with dolomite like 5032-5040.
- 5050-5055 Siltstone, medium dark gray (N4), argillaceous, micaceous; and shale, medium dark gray (N4), fissile.
- 5055-5060 Like 5050-5055.
- 5060-5065 Siltstone, medium gray (N5), sandy, micaceous.
- 5065-5075 Like 5060-5065.
- 5075-5085 Shale, medium dark gray (N4), silty, slightly micaceous.
- 5085-5100 Like 5075-5085.

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