

Operator: United Producing Company, Inc.
 Farm: Yukon Pocahontas Coal Co. et al
 Well No.: 6-1671
 Location: Buchanan County
 6500' S. of 37°15') approximate
 10,250' W. of 81°55')

Geologic Sample Log
 prepared by:
 E. T. Jacobsen
 U. S. Geological Survey
 Lexington, Kentucky
 April, 1950

Elevation: 1780' 8" Ground
 Total Depth: 4536'
 Drilling Commenced: November 7, 1949
 Well Completed: April 13, 1950
 Result: Dry hole

GEOLOGIC LOG

<u>Depth (feet)</u>	<u>Lithology</u>
102 - 105	Graywacke, very light gray (N8), very fine-grained to fine-grained, subangular to angular, very poorly sorted some medium-grained quartz, about 90% quartzose, dark and green inclusions, micaceous (muscovite, some chlorite phlogopite), silt cement, very slightly calcareous, moderately well cemented; trace coal.
105 - 108	Ditto, predominately loose grains.
108 - 115	Ditto, slightly conglomeratic, about 20% angular quartz fragments, to very coarse-grained size, non-calcareous; some clusters moderately well cemented.
115 - 120	Ditto, very slightly conglomeratic, fine-grained to medium grained, some angular coarse-grained quartz, little chert fragments.
120 - 125	Ditto, about 80% quartzose, some medium-grained green non-chloritic inclusions.
125 - 130	Ditto, few quartz fragments to very coarse-grained chert to coarse-grained.
130 - 138	Ditto, very slightly conglomeratic (?), fine-grained, predominately loose grains.
138 - 143	Ditto, non-conglomeratic, very fine-grained, loose grains.

- 143 - 148 Ditto, very slightly conglomeratic (?), fine-grained, more chert inclusions, predominately loose grains.
- 148 - 153 Ditto, slightly conglomeratic, angular quartz fragments to coarse-grained size.
- 153 - 158 Shale, medium dark gray (N4), very slightly silty to some silty, micaceous; and shale, carbonaceous to some slightly shaly coal, dark gray to greenish black (N3-2), some pyrite.
- 158 - 163 Graywacke, slightly conglomeratic, very light gray (N8), fine-grained, subangular to angular, very poorly sorted (very fine-grained to very coarse-grained quartz fragments), about 85% quartzose, dark, green, and red inclusions, micaceous, predominately loose grains.
- 163 - 169 Siltstone, light gray (N7), coarse-grained to very coarse-grained, subrounded to subangular, moderately well sorted, dark and greenish inclusions, micaceous, moderately well cemented; and shale, very silty to slightly silty, medium gray (N5), micaceous, about 40%.
- 169 - 174 Shale, slightly silty to some very silty, medium gray (N5), micaceous.
- 174 - 179 Ditto.
- 179 - 184 Ditto, about 70%; siltstone, shaly, medium light gray (N6), coarse-grained, dark inclusions, slightly micaceous, moderately well cemented, about 30%.
- 184 - 188 Shale, slightly silty to very silty, slightly carbonaceous to carbonaceous, dark gray (N3), micaceous, some coal, shaly, fissile.
- 188 - 193 Graywacke, calcareous, light gray (N7), very fine-grained, subangular, very poorly sorted, about 70% quartzose, brownish and dark inclusions, green inclusions, very micaceous, (muscovite, phlogopite, and some chlorite), silt and shale size cement, moderately well cemented.

- 193 - 199 Shale, medium gray (N5), non-silty to little very silty, very finely micaceous, about 50%; graywacke, as above, about 50%.
- 199 - 211 Shale, medium dark gray (N4), very finely micaceous; some coal, shaly, slightly fissile; trace pyrite; little graywacke, as above.
- 211 - 216 Shale, non-silty to very silty, medium dark gray (N4), micaceous; loose light olive gray (5Y 6/1), chert fragments to very coarse-grained size; some pyrite.
- 216 - 223 Shale, medium dark gray (N4), to medium-gray (N5), very finely micaceous, coal, shaly, and very carbonaceous shale; shale, slightly silty, medium gray (N5), very micaceous; and graywacke, medium light gray (N6), very fine-grained (approaching siltstone), about 80% quartzose, very micaceous; probably thin and interbedded; trace pyrite.
- 223 - 229 Shale, slightly silty to non-silty, medium gray (N5), and siltstone, calcareous to slightly calcareous, light gray (N7), dark inclusions, micaceous.
- 229 - 238 Shale, medium dark gray (N4), slightly fissile, very finely micaceous.
- 238 - 243 Shale, slightly silty to silty, medium gray (N5), finely micaceous.
- 243 - 250 Shale, slightly silty to non-silty, medium gray (N5), very finely micaceous.
- 250 - 258 Shale, very calcareous to non-calcareous, slightly silty, medium gray (N5), very slightly fissile, very finely micaceous.
- 258 - 265 Ditto, very slightly calcareous to non-calcareous.

- 265 - 270 Shale, slightly calcareous to non-calcareous, slightly silty to non-silty, dark gray (N3), slightly micaceous; some (about 15%) siltstone, shaly, to very silty shale, medium gray (N5), very slightly calcareous to calcareous, slightly micaceous.
- 270 - 281 Shale, non-silty to slightly silty, medium dark gray(N4), finely micaceous; little shale, sandy, calcareous, medium dark gray (N4), micaceous; little shale, sandy, calcareous, medium dark gray (N4), micaceous.
- 281 - 285 Shale, sandy, part slightly calcareous, medium dark gray (N4), micaceous; and shale, non-silty to slightly silty, medium dark gray (N4.5), micaceous; trace coal and pyrite.
- 285 - 299 Shale, non-silty to slightly silty, medium gray (N5), slightly fissile; some (about 20% siltstone, medium gray (N5), coarse-grained, dark inclusions, micaceous.
- 299 - 308 Graywacke, medium light gray (N6), very fine-grained, subangular to subrounded, poorly sorted, about 70% quartzose, dark inclusions, micaceous to very micaceous, silt cement, moderately well cemented.
- 308 - 314 Ditto, medium light gray and medium dark gray (N4), shaly.
- 314 - 321 Shale, non-silty to some very silty, medium gray (N5), trace very finely micaceous material.
- 321 - 326 Ditto, slightly silty to silty; little siltstone, medium light gray (N6), coarse-grained, micaceous; and little graywacke, light gray (N7), very fine-grained.
- 326 - 331 Graywacke, very light gray (N8), fine-grained, subangular to angular, poorly sorted, few angular, coarse-grained quartz fragments, green inclusions, micaceous, predominately loose grains, few clusters with much silty and shale cement, moderately poorly cemented.
- 331 - 338 Ditto.

- 335 - 338 Graywacke, as above, fine-grained to medium-grained, slightly conglomeratic (?), numerous medium-grained and coarse-grained angular quartz fragments, few to very coarse-grained size, few clusters, about 55% quartzose with much brown inclusions, very well cemented.
- 338 - 340 No sample.
- 340 - 344 Ditto, fine-grained, very slightly conglomeratic (?), angular quartz fragments to medium-grained noted.
- 344 - 350 Ditto, fine-grained to very fine-grained, few more clusters; considerable chlorite noted, moderately well cemented.
- 350 - 355 Ditto, slightly conglomeratic, (?), few very angular quartz fragments to very coarse-grained size, fine-grained, to medium-grained, very poorly sorted, more clustered, about 55% quartzose, moderately friable.
- 355 - 360 Ditto, very slightly conglomeratic (?), fine-grained, many green inclusions, considerable chlorite, predominately loose grains.
- 360 - 365 Ditto, fine-grained to medium-grained.
- 365 - 371 Ditto, slightly conglomeratic, quartz fragments to very coarse-grained size, about 90%; shale, medium gray (N5), very finely micaceous, about 10%; trace very carbonaceous shale.
- 371 - 377 Shale, medium dark gray (N4), slightly fissile, slightly resinous luster, very finely micaceous; some shale, very carbonaceous, dark gray (N8), slightly fissile, slightly trace pyrite.
- 377 - 385 Shale, very silty, medium dark gray (N4), micaceous.

- 385 - 392 Shale, medium gray (N5), very finely micaceous; about 15% graywacke, light gray (N7), fine-grained, about 60% quartzose, brownish and green inclusions, micaceous, silt cement, moderately well cemented; about 15% shale, carbonaceous, dark gray (N3).
- 392 - 399 Graywacke, as above, very fine-grained, some phlogopite and chlorite noted, loose grains.
- 399 - 404 Graywacke, light gray (N7), very fine-grained, subangular, about 60% quartzose, dark, brown, and some green inclusions, micaceous (muscovite and some phlogopite and chlorite), silt and shale cement, moderately well cemented.
- 404 - 409 Ditto, very finely micaceous, predominately loose grains.
- 409 - 416 Ditto, fine-grained, few chert fragments noted, about 65% quartzose.
- 416 - 421 Ditto.
- 421 - 428 Ditto, trace calcareous material.
- 428 - 434 Ditto, about 80% quartzose.
- 434 - 439 Ditto.
- 439 - 444 Ditto, slightly calcareous to very slightly calcareous, very fine-grained, to fine-grained, about 60% quartzose, about 10% shale, silty to non-silty, medium dark gray to medium gray (N4-5), very finely micaceous.
- 448 - 449 Graywacke, as above, calcareous, slightly calcareous, fine-grained, about 70% quartzose.
- 449 - 454 Shale, silty to non-silty, medium gray (N5), very finely micaceous, about 30%; graywacke, as above, very slightly calcareous, about 70%.

- 454 - 462 Shale, non-silty to very silty, medium gray (N5), very finely micaceous, very slightly calcareous.
- 462 - 471 Ditto, slightly silty to silty.
- 471 - 476 Siltstone, calcareous, medium light gray (N6), medium-grained, micaceous, dark inclusions, about 40%; shale, slightly calcareous, non-silty to very silty, medium gray (N5), micaceous.
- 476 - 482 Shale, very silty to non-silty, calcareous to very slightly calcareous, medium gray (N5), finely micaceous to micaceous.
- 482 - 487 Shale, silty to non-silty, medium dark gray (N4), very slightly calcareous, finely micaceous.
- 487 - 492 Siltstone, calcareous, shaly, medium light gray (N6), coarse-grained, poorly sorted, dark inclusions, micaceous, about 50%; shale, slightly silty to silty, medium dark gray (N4), finely micaceous, about 50%.
- 492 - 498 Shale, slightly silty to non-silty, medium gray (N5), very finely micaceous.
- 498 - 504 Shale, very slightly silty, to very silty, slightly calcareous, medium gray (N5), very finely micaceous.
- 504 - 510 Shale, medium gray (N5), very finely micaceous, about 75%; shale, very silty, non-calcareous to some calcareous, medium light gray (N6), about 25%; trace pyrite.
- 510 - 517 Shale, silty to non-silty, medium dark gray (N4), very slightly fissile, about 75%; graywacke, slightly to very slightly calcareous, light gray (N6.5), very fine-grained, sub-angular, very poorly sorted, about 80% quartzose, dark inclusions, micaceous, much shale and silt cement, moderately friable, about 20%; trace pyrite.

- 517 - 523 Shale, silty, dark medium gray (N4.5), finely micaceous, about 80%, graywacke, as above, about 75% quartzose, some phlogopite noted, well cemented, about 20%

- 523 - 528 Shale, slightly silty, medium dark gray (N4), finely micaceous, about 80%; graywacke, as above, well cemented to moderately well cemented, about 20%.

- 528 - 530 Graywacke, slightly calcareous, very light gray (N8), fine-grained, subangular to angular, very poorly sorted, about 75% quartzose, black, green, and brown inclusions, micaceous (muscovite, phlogopite, and chlorite (?) noted), silt and shale cement, moderately well cemented to moderately friable, predominately loose grains.

- 530 - 533 Ditto, very slightly calcareous.

- 533 - 541 Ditto, few coarse-grained quartz noted.

- 541 - 545 Ditto, slightly conglomeratic (?), angular quartz fragments (about 10%) to very coarse-grained size.

- 545 - 550 Ditto, very slightly conglomeratic (?).

- 550 - 555 No sample.

- 555 - 560 Ditto, bluish gray, very coarse-grained chert inclusions noted, some 75% to some 60% quartzose.

- 560 - 564 Ditto, calcareous to slightly calcareous, non-conglomeratic.

- 564 - 570 Graywacke, medium light gray (N6), very fine-grained, subangular to subrounded, poorly sorted, about 60% quartzose, dark and green inclusions, micaceous, silt and shale cement, moderately well cemented.

- 570 - 580 Ditto, about 55% quartzose, part very slightly calcareous, very micaceous, well cemented, little (about 10%) shale, silty, medium gray (N5), micaceous,

- 580 - 582 Graywacke, calcareous to very slightly calcareous, as above, loose grains.

- 582 - 588 Graywacke, as above, non-calcareous, clustered, moderately well cemented, about 70%; siltstone, shaly, medium gray (N5), medium-grained, micaceous, about 20%; shale, silty, medium gray (N5), micaceous, about 10%.
- 588 - 594 Shale, medium dark gray (N4), part slightly silty, finely micaceous.
- 594 - 600 Shale, as above, 75%, graywacke, light gray (N7), very fine-grained, subangular, poorly sorted, about 80% quartzose, dark inclusions, slightly micaceous, silt and shale cement, well to very well cemented, about 25%.
- 600 - 606 Shale, medium dark gray (N4), very finely micaceous, part very slightly fissile.
- 606 - 612 Ditto.
- 612 - 618 Ditto, trace very finely micaceous material.
- 618 - 622 Ditto, very finely micaceous.
- 622 - 637 Shale, dark gray (N3), very finely micaceous part slightly fissile.
- 637 - 646 Shale, medium dark gray (N4), non-silty to slightly silty, very finely micaceous, part very slightly fissile.
- 646 - 654 Ditto, about 10% siltstone, shaly, medium gray (N5), medium-grained, micaceous.
- 654 - 663 Shale, silty to non-silty, medium dark gray (N4), medium gray (N5), finely micaceous, about 80%; siltstone, medium gray to medium light gray (N5-6), as above, about 20%.
- 663 - 669 Shale, very slightly silty to very silty, medium gray (N5), finely micaceous, about 70%; siltstone, medium light gray (N6), as above, very slightly calcareous, about 30%.

- 669- 679 Graywacke, light gray to very light gray (N7-8), very fine-grained, (approaching siltstone), subrounded, to subangular, moderately well sorted, about 80% quartzose, dark and brown inclusions, micaceous, moderately friable to well cemented.
- 679 - 689 Shale, carbonaceous to very carbonaceous, dark gray (N3), part very finely micaceous, about 25% shale, very silty, medium gray (N5), micaceous, about 25%; graywacke and siltstone, medium light gray (N6), and light gray (N7), as above, about 50%; trace pyrite.
- 689 - 695 Graywacke, medium light gray (N6), very fine-grained (approaching siltstone), subrounded, moderately well sorted, about 85% quartzose, dark inclusions, micaceous, silt cement, moderately well cemented to some well cemented, about 50%; shale, silty, medium dark gray (N4), finely micaceous to micaceous, about 50%.
- 695 - 704 Graywacke, as above, part of shale approaching siltstone.
- 704 - 718 Shale, medium dark gray (N4), slightly fissile to very slightly fissile, trace very finely micaceous material.
- 718 - 728 Shale, very silty, to little shaly siltstone, medium dark gray (N4), very micaceous.
- 728 - 738 Shale, medium gray (N5), very slightly fissile, trace very finely micaceous material.
- 738 - 742 Graywacke, light gray (N7), very fine-grained, subrounded to subangular, poorly sorted, about 75% quartzose, dark and some green and brown inclusions, micaceous, silt and shale cement, moderately poorly cemented.
- 742 - 746 Ditto, small clusters.
- 746 - 750 Graywacke, as above, clustered, about 80%; shale, very silty to little non-silty, medium dark gray (N4), micaceous about 20%.
- 750 - 756 Graywacke, as above, very small clusters, more green inclusions very slightly calcareous.

- 756 - 762 Shale, very silty to non-silty, medium dark gray (N4), micaceous.
- 762 - 768 Shale, as above, non-silty to some very silty, about 80%, graywacke, medium gray (N6.5), very fine-grained, subangular to subrounded, very poorly sorted, about 75% quartzose, dark and green inclusions, micaceous, (muscovite, and little chlorite), silt cement; moderately well cemented, about 20%.
- 768 - 776 Graywacke, as above, about 50%; shale, very silty to very slightly silty, medium dark gray (N4), to medium gray (N5), micaceous, about 50%.
- 776 - 783 Graywacke, as above, part very micaceous.
- 783 - 794 Shale, silty, grayish black (N2), finely micaceous, part slightly carbonaceous, about 10% coal, blocky, high luster, trace pyrite.
- 794 & 796 No sample.
- 796 - 806 Shale, silty to very silty, medium dark gray to medium gray (N4-5), micaceous, about 50%; shale, very carbonaceous, grayish black (N2), fissile, about 20%, siltstone, medium light gray (N6), very coarse-grained (approaching very fine-grained graywacke), moderately well cemented, about 30%; trace pyrite.
- 806 - 813 Siltstone, as above, about 50%, shale, very silty to non-silty, medium gray (N5), finely micaceous, about 50%.
- 813 - 816 Graywacke, light gray (N7), very fine-grained, subrounded, to subangular, poorly sorted, about 75% quartzose, brown brownish, dark, and some green inclusions, micaceous, silt cement, moderately well cemented.
- 816 - 822 Ditto, part slightly calcareous.

- 822 - 828 Ditto, about 85% quartzose, very small clusters very slightly calcareous.
- 828 - 836 Ditto, about 75% quartzose, clustered, non-calcareous, well cemented, about 70%; shale, very silty, medium dark gray (N4), micaceous, about 30%.
- 836 - 841 Ditto.
- 841 - 850 Ditto, part of shale, slightly silty.
- 850 - 857 Shale, slightly silty to non-silty, medium dark gray (N4), finely micaceous.
- 857 - 864 Coal, shaly, and some shale, very carbonaceous, trace plant fossil, about 20%; shale, very silty to very slightly silty, medium dark gray (N4), micaceous, about 50% graywacke, medium light gray (N6), to light gray (N7), very fine-grained, about 70% quartzose, dark and few green inclusions, micaceous, silt cement, moderately well cemented, about 30%; trace pyrite and chert.
- 864 - 875 Graywacke, light gray (N7), very fine-grained to fine-grained, subangular, very poorly sorted, about 30% quartzose, dark and some green inclusions, micaceous, little chlorite, silt cement, moderately well to well cemented.
- 875 - 877 Ditto, fine-grained to very fine-grained, predominately loose grains and very small clusters.
- 377 - 884 Ditto, part slightly calcareous.
- 884 - 888 Ditto, part very slightly calcareous.
- 888 - 896 Ditto, fine-grained, about 75% quartzose small clusters, non-calcareous.
- 896 - 902 Ditto, very light gray (N8), fine-grained to medium-grained, subangular to angular, about 85% quartzose; little (about 5%) medium light gray (N6), graywacke, about 50% quartzose.

- 902 - 908 Ditto, very light gray, as above.
- 908 - 914 Ditto, some coarse-grained quartz; about 10% coal, slightly shaly, and some very carbonaceous shale.
- 914 - 922 Ditto, very fine-grained to some medium-grained, about 80% quartzose, many loose grains, one very coarse-grained quartz piece noted.
- 922 - 927 Ditto, fine-grained to very fine-grained, predominately loose grains, about 85% quartzose.
- 927 - 932 Graywacke, as above, light gray (N7), very fine-grained, about 70% quartzose, about 50%; shale, medium dark gray to grayish black (N4-2), part carbonaceous, very finely micaceous, about 50%.
- 932 - 937 Shale, slightly to very slightly silty, medium dark gray (N4), micaceous, about 50%; graywacke, medium light gray (N6), very fine-grained, subrounded to subangular, very poorly sorted, about 70% quartzose, micaceous, shale and silt cement, moderately well cemented, about 50%.
- 937 - 947 Shale, several pieces showing shale to graywacke contact.
- 947 - 955 Ditto; shale, slightly silty to silty; some chlorite noted in graywacke.
- 955 - 961 Graywacke, as above, very fine-grained to fine-grained, predominately loose grains, about 60%; shale, dark gray (N3), finely micaceous, about 40%; little very carbonaceous shale, trace coal.

- 961 - 967 Graywacke, part slightly calcareous to calcareous, medium light gray and light gray (N6-7), very fine-grained, (approaching siltstone), subrounded to subangular, poorly sorted, about 70 to 75% quartzose, micaceous, silt and shale cement, moderately well cemented, about 75%; shale, silty, medium gray (N5), micaceous, about 25%; several pieces pink, gray, and yellowish gray chert, medium-grained.
- 967 - 973 Graywacke, as above, part slightly to very slightly calcareous, part very well cemented, about 50%; shale, silty to slightly silty, about 50%; some yellowish gray (5Y8) angular, medium-grained size chert; trace pyrite.
- 973 - 979 Ditto; graywacke, calcareous, medium light gray (N6), about 60% quartzose, very micaceous, about 50%; shale, very silty to non-silty, part slightly calcareous, very micaceous, about 50%.
- 979 - 983 Ditto; graywacke, non-calcareous, very well cemented, about 50%; shale, very silty, approaching siltstone.
- 983 - 990 Shale, medium gray (N5), very slightly fissile, very finely micaceous.
- 990 - 999 Ditto, part very slightly silty, very slightly to slightly fissile.
- 999 - 1008 Ditto.
- 1008 - 1024 Ditto.
- 1024 - 1037 Ditto, medium dark gray (N4).
- 1037 - 1039 Shale, silty to slightly silty, medium dark gray to dark gray (N4-3), finely micaceous to micaceous.

- 1039 - 1047 Coal, part high luster and blocky, small part slightly shaly, about 25%, shale, dark gray (N3), trace very finely micaceous material, about 35%; siltstone, medium gray (N5), medium-grained, moderately well sorted, slightly micaceous, about 20%; graywacke, medium light gray (N6), very fine-grained, about 70% quartzose, dark inclusions, micaceous, silt cement, moderately well cemented, about 20%; several medium-grained pieces chert.
- 1047 - 1055 Ditto; coal, about 40%; trace plant fossil; shale, dark gray (N3), 30%; siltstone, part very well cemented, about 20%; graywacke, about 10%.
- 1055 - 1063 Graywacke, medium light gray (N6), very fine-grained, subrounded, poorly sorted, about 60% quartzose, dark inclusions, micaceous, much silt and shale cement, moderately well to well cemented, about 50%; shale, very silty to non-silty, medium light gray and medium gray (N6-5), finely micaceous, about 50%.
- 1063 - 1071 Graywacke, medium light gray and light gray (N6.8), very fine-grained, subrounded to subangular, very poorly sorted, about 75% quartzose, dark, green, and some brown inclusions, micaceous, silt and shale cement, moderately well cemented.
- 1071 - 1081 Graywacke, very light gray (N8), fine-grained, subangular to angular, very poorly sorted, about 85% quartzose, dark and green inclusions, micaceous (muscovite and chlorite), silt and shale cement, moderately well cemented.
- 1081 - 1086 Ditto, predominately loose grains.
- 1086 - 1091 Ditto.
- 1091 - 1096 Ditto, very slightly calcareous.
- 1096 - 1101 Ditto, non-calcareous.
- 1101 - 1108 Ditto, very small clusters.

- 1108 - 1117 Graywackes, light gray (N7), as above, 85%; shale, medium gray (N5), finely micaceous, part slightly silty, about 15%; some shale, very carbonaceous.
- 1117 - 1124 Shale, very silty to slightly silty, medium dark gray (N4), very micaceous.
- 1124 - 1128 Graywacke, light gray (N7), very fine-grained, subangular to subrounded, about 70% quartzose, dark and some green inclusions, micaceous, silt and shale cement, moderately well cemented, trace pyrite.
- 1128 - 1134 Shale, medium gray to grayish black (N5-2), small part very carbonaceous, very finely micaceous. m
- 1134 - 1139 Graywacke, very light gray, very fine-grained, subangular to subrounded, moderately well sorted, about 90% quartzose, very fine-grained, dark brown inclusions, very slightly micaceous, silt cement, moderately well cemented.
- 1139 - 1143 Ditto, moderately poorly sorted, about 5% coal, slightly shaly.
- 1143 - 1148 Ditto, predominately loose grains; some coal, as above.
- 1148 - 1153 Ditto, loose grains, approaching siltstone.
- 1153 - 1156 Ditto.
- 1156 - 1161 Ditto, part small clusters.
- 1161 - 1166 Shale, silty to slightly silty, dark gray (N3), trace mica.
- 1166 - 1171 Shale, silty, medium dark gray (N4), trace mica.
- 1171 - 1181 Siltstone, medium light gray (N6), coarse-grained, moderately poorly sorted, dark inclusions, slightly micaceous, moderately well to very well cemented, shale cement, about 50%; shale, silty to very slightly silty, medium dark gray (N4), slightly micaceous, about 50%; several pieces showing contact.

- 1181 - 1191 Ditto, shale, very silty to slightly silty.
- 1191 - 1200 Ditto.
- 1200 - 1206 Shale, very carbonaceous, dark gray (N3), trace very finely micaceous material; about 30%; some shale, very silty, dark gray (N3), graywacke, light gray (N7), very fine-grained, subangular, very poorly sorted, about 75% quartzose, browns and dark inclusions, few green inclusions, micaceous, silt cement, moderately well cemented, about 70%; some angular medium-grained yellowish gray chert in sample.
- 1206 - 1213 Graywacke, very small clusters, more chlorite noted.
- 1213 - 1221 Ditto, clustered.
- 1221 - 1229 Ditto, very light gray (N8), very small clusters, very slightly calcareous.
- 1229 - 1237 Ditto, part slightly calcareous.
- 1237 - 1242 Ditto, about 70% quartzose, about 10% shale, very silty to slightly silty, part very carbonaceous, medium dark gray to dark gray (N4-3).
- 1242 - 1249 Graywacke, as above, about 90%; shale, silty to very slightly silty, medium dark gray (N4), micaceous, about 10%.
- 1249 - 1258 Shale, non-silty to little silty, medium gray (N5), very finely micaceous.
- 1258 - 1266 Ditto, about 85%; siltstone, medium light gray (N6), very coarse-grained, poorly sorted, very slightly calcareous, about 15%.
- 1266 - 1275 Shale, as above, silty to little non-silty, dark gray (N3.5), finely micaceous, about 85%; siltstone, grading to very fine-grained graywacke, as above, about 15%

- 1275 - 1283 Graywacke, slightly calcareous to very slightly calcareous, medium light gray (N6), very fine-grained, subangular to subangular, moderately well sorted, about 80% quartzose, dark inclusions, micaceous, well cemented, about 60%; shale, very silty to very slightly silty, medium dark gray (N4), very finely micaceous, about 40%.
- 1283 - 1293 Shale, silty to very slightly silty, medium dark gray (N4), very finely micaceous.
- 1293 - 1301 Shale, very silty to very slightly silty, dark gray (N3), finely micaceous, small part nodular, about 60% siltstone, medium light gray (N6), very coarse-grained (approaching graywacke), dark inclusions, slightly micaceous, moderately well cemented, about 40%.
- 1301 - 1309 Siltstone, as above, medium light gray and medium gray (N6-5), about 65%; shale, as above, about 35%.
- 1309 - 1314 Graywacke, very light gray (N8), very fine-grained, subangular to subrounded, moderately well sorted, about 90% quartzose, dark and brown inclusions, micaceous, silt cement, moderately well cemented.
- 1314 - 1321 Shale, silty to slightly silty, medium dark gray (N4), finely micaceous, about 50%; graywacke, as above, about 50%.
- 1321 - 1332 Shale, slightly silty to non-silty, medium gray (N5), trace very finely micaceous material.
- 1332 - 1340 Ditto.
- 1340 - 1353 Shale, non-silty to little very slightly silty, medium gray (N5), trace very finely micaceous material.
- 1353 - 1361 Shale, silty, medium gray (N5), very finely micaceous, little (about 5%) siltstone, medium light gray (N6).
- 1361 - 1369 Shale, very silty to very slightly silty, medium gray (N5), very finely micaceous.

- 1369 - 1374 Graywacke, very light gray (N8), very fine-grained, subrounded, poorly sorted, about 80% quartzose, dark inclusions, slightly micaceous, silt cement, moderately well cemented, about 40%; shale, very silty to non-silty, dark gray (N3), very finely micaceous, about 60%.
- 1374 - 1377 Graywacke, as above, very poorly sorted, about 90% quartzose, few angular medium-grained quartz crystals and one very coarse-grained quartz sliver noted, about 20% shale, as above.
- 1377 - 2308 No samples available for study.
- 2308 - 2315 Shale, medium gray (N5), part very slightly silty, trace very finely micaceous material.
- 2315 - 2321 Ditto, non-silty to some silty; little (about 15%) limestone, shaly, brownish gray (5YR 4/1), very finely clastic.
- 2321 - 2330 Shale, slightly silty, medium dark gray (N4), very finely micaceous.
- 2330 - 2339 Shale, non-silty to very silty, medium gray (N5), very finely micaceous.
- 2339 - 2349 Shale, slightly silty to non-silty, medium dark gray (N4), very finely micaceous.
- 2349 - 2361 Shale, silty to non-silty, small part calcareous, medium gray (N5), part with brown and dark gray nodules, slightly micaceous; little limestone, shaly, brownish gray; trace pyrite.
- 2361 - 2370 Shale, silty to sandy, medium light gray (N6), slightly micaceous, part approaching shaly siltstone; trace pyrite.
- 2370 - 2379 Siltstone, shaly, part slightly calcareous to calcareous, medium light gray (N6), medium-grained, finely micaceous.

- 2379 - 2383
Graywacke, slightly calcareous to calcareous, medium light gray (N6), very fine-grained (approaching siltstone), subrounded to subangular, poorly sorted, about 85% quartzose, dark inclusions, micaceous (muscovite, phlogopite, and chlorite), about 50%; shale, non-silty to very silty, medium light gray (N6), finely micaceous; some light brownish gray limestone; trace pyrite.
- 2383 - 2388
Siltstone, as graywacke, above, some medium-grained, about 50%; shale, silty to non-silty, slightly to very slightly calcareous, medium gray and medium light gray (N5-6), trace brownish gray limestone and pyrite.
- 2388 - 2389
No sample.
- 2389 - 2392
Graywacke, calcareous, very light gray (N8), very fine-grained, subangular, poorly sorted, about 90% quartzose, very fine-grained, dark and few green inclusions, slightly micaceous, considerable silt; moderately well cemented, about 70%; shale, as above, about 30%.
- 2392 - 2397
Graywackes, as above, calcareous to slightly calcareous, some loose grains; trace pyrite.
- 2397 - 2403
Siltstone, calcareous to very slightly calcareous, part sandy, medium light gray (N6), very coarse-grained to medium-grained, slightly micaceous, moderately well cemented, about 75%; limestone, shaly, medium light gray, very coarsely clastic, slightly fossiliferous (crinoids), about 20%; limestone, medium light gray (N8), finely clastic, moderately soft, about 5%.
- 2403 - 2407
Limestone, medium light gray, as above, fossiliferous (macrofossil fragments), part shaly; little light brownish gray, very finely clastic limestone and little very light gray limestone, as above.
- 2407 - 2412
Limestone, light brownish gray, very finely clastic, 25%; limestone, very light gray (N8), very finely clastic to very coarsely crystalline, about 25%; limestone, medium gray (N5), very finely clastic, about 25%; limestone, medium light gray, coarsely clastic, as above, about 25%; trace pyrite.

- 2412 - 2418 Graywacke, slightly calcareous, very light gray (N8), very fine-grained, sub-angular, poorly sorted, about 95% quartzose (approaching quartzose sandstone), few dark inclusions, very slightly micaceous, some silt cement, moderately well cemented to moderately friable.
- 2418 - 2419 Ditto, calcareous to slightly calcareous, predominantly loose grains; some iron staining.
- 2419 - 2420 Ditto, very few clusters, slightly to very slightly calcareous.
- 2420 - 2424 Ditto, few non-calcareous clusters.
- 2424 - 2426 Ditto.
- 2426 - 2429 Ditto.
- 2429 - 2931 Ditto, very fine-grained to fine-grained, very poorly sorted.
- 2431 - 2431 Ditto, few clusters; much iron staining and many bit fragments; about 10% shale, medium dark gray (N4), very finely micaceous.
- 2431 - 2434 Graywacke, as above, approaching quartzose sandstone, less iron-staining.
- 2434 - 2436 Ditto.
- 2436 - 2438 Ditto.
- 2438 - 2440 Ditto.
- 2440 - 2442 Ditto.
- 2442 - 2444 Ditto, few medium-grained quartz noted.
- 2444 - 2446 Ditto.
- 2446 - 2448 Shale, dark gray to grayish black (N3-2), part sandy to silty, part non-silty and finely micaceous, and part carbonaceous, about 20% trace coal; graywacke, very fine-grained, slightly calcareous, as above, about 80%; trace pyrite.

- 2448 - 2452 Graywacke, very light gray (N8), very slightly calcareous, very fine-grained, subangular, very poorly sorted, few medium-grained quartz grains, about 92% quartzose, minute dark inclusions, very slightly micaceous, silt cement, moderately friable.
- 2452 - 2456 Graywacke, as above, some very well cemented clusters, moderately well sorted.
- 2456 - 2458 Ditto.
- 2458 - 2461 Ditto.
- 2461 - 2463 Ditto, very slightly calcareous to slightly calcareous.
- 2463 - 2466 Ditto, very slightly calcareous, some angular medium-grained quartz, predominantly loose grains; some iron staining.
- 2466 - 2469 Ditto, clustered, non-calcareous to very slightly calcareous, slightly micaceous, moderately friable to well cemented.
- 2469 - 2472 No sample.
- 2472 - 2475 Ditto, many loose grains, part approaching fine-grained.
- 2475 - 2478 Shale, very silty to very slightly silty, dark gray (N3), finely micaceous, about 25%; graywacke, very fine-grained, as above, about 75%; considerable pyrite.
- 2478 - 2481 Graywacke, as above, non-calcareous.
- 2481 - 2484 Ditto.
- 2484 - 2487 Ditto, predominantly loose grains.
- 2487 - 2489 Ditto, more clusters, moderately friable to friable.
- 2489 - 2494 Ditto.
- 2494 - 2496 Ditto, trace pyrite.

- 2496 - 2498 Ditto, very fine-grained, non-calcareous to slightly calcareous, mostly loose grains.
- 2498 - 2498 Ditto, much iron staining.
- 2498 - 2500 Ditto, fine-grained, slightly to very slightly calcareous, less iron staining.
- 2500 - 2503 Ditto, very fine-grained to fine-grained, calcareous to very slightly calcareous.
- 2503 - 2505 Ditto, calcareous to non-calcareous.
- 2505 - 2508 Ditto, trace pyrite.
- 2508 - 2511 Ditto, clustered; some pyrite.
- 2511 = 2513 Ditto, fine-grained to very fine-grained, slightly calcareous, to non-calcareous, predominantly loose grains.
- 2513 - 2516 Ditto, fine-grained, calcareous to very slightly calcareous.
- 2516 - 2519 Ditto, slightly calcareous, few angular medium-grained pieces quartz noted.
- 2519 - 2522 Ditto, part clustered, several pieces pyrite.
- 2522 - 2523 Ditto, very fine-grained, very slightly calcareous, clustered, trace pyrite.
- 2523 - 2525 Ditto, slightly calcareous to non-calcareous, very fine-grained to fine-grained, predominantly loose grains.
- 2525 - 2528 Ditto, fine-grained to very fine-grained, calcareous to non-calcareous, some angular medium-grained quartz noted; trace pyrite.
- 2528 - 2529 Ditto, very fine-grained, more iron staining.
- 2529 - 2534 Shale, calcareous, medium dark gray (N4), very finely micaceous; little (about 5%) limestone, medium dark gray (N4), medium clastic to coarsely clastic, fossiliferous (macrofossil fragments), trace pyrite.

- 2534 - 2536 Shale, very calcareous (approaching shaly limestone), medium gray (N5), about 50%; limestone, slightly shaly, medium gray (N5), finely clastic to part approaching medium clastic, fossiliferous (crinoids and other macrofossil fragments), about 50%.
- 2536 - 2541 Limestone, slightly shaly to shaly, medium dark gray (N4), finely clastic to medium clastic, fossiliferous (macrofossil fragments and crinoids), about 50%; shale, very calcareous, medium dark gray (N4), very finely micaceous, about 50%; trace pyrite.
- 2541 - 2550 Ditto; limestone, 60%; shale, 40%.
- 2550 - 2555 Limestone, very shaly, medium dark gray (N4), very finely clastic to part very finely crystalline, slightly fossiliferous.
- 2555 - 2563 Ditto, few very coarsely crystalline, light gray (N7), pieces interbedded with some soft medium light gray (N6.5), finely clastic limestone.
- 2563 - 2570 Ditto, trace crinoids.
- 2570 - 2580 Ditto, few crinoids and other macrofossil fragments.
- 2580 - 2590 Limestone, as above, about 50%; shale, medium dark greenish gray (5GY 5/1), slightly resinous luster with some brown and dark gray nodules, about 30%; shale, grayish red (10R 4/2), slightly resinous luster, about 20%.
- 2590 - 2596 Shale, grayish red, as above, very slightly calcareous, about 80%; shale, greenish gray, as above, about 20%.
- 2595 - 2605 Shale, grayish red, as above, part slightly to very slightly silty, about 75%; shale, silty to shaly siltstone, slightly calcareous, greenish gray (5GY 6/1), medium-grained, micaceous, moderately poorly cemented.

- 2605 - 2610 Siltstone, as above, to shale, non-silty with resinous luster, about 50%; shale, grayish red, as above, non-silty to silty, very slightly calcareous.
- 2610 - 2614 Shale, grayish red (10R 4/2), very slightly calcareous, very finely micaceous, about 85%; shale, non-silty to silty, greenish gray (5GY 6/1), very slightly calcareous, finely micaceous.
- 2614 - 2621 Shale, slightly silty to non-silty, grayish red (10R 4/2), part very slightly calcareous, finely micaceous.
- 2621 - 2627 Shale, dusky red (10R 3/2), very finely micaceous, about 85%; shale, silty to non-silty, slightly to very slightly calcareous, greenish gray (5GY 6/1), finely micaceous, about 15%; few pieces showing contact.
- 2627 - 2632 Shale, very slightly to slightly calcareous, dusky red (10R 3/2), slightly nodular and mottled with gray shale, trace micaceous material, about 70%; shale; grayish red (5R 4/2), trace very finely micaceous material, about 10%, shale, slightly calcareous, medium gray (N5), about 10%, shale, calcareous to slightly calcareous, greenish gray (5GY 6/1), some pyrite crystal inclusions; some nodular, about 10%; trace medium-grained medium clastic limestone.
- 2632 - 2643 Shale, calcareous to non-calcareous, grayish red (10R 4/2), part mottled with greenish gray shale, trace very finely micaceous material.
- 2643 - 2649 Ditto.
- 2649 - 2651 Ditto.
- 2651 - 2656 Shale, very dusky red purple (5RP 2/2), trace very finely micaceous material, about 50%; limestone, medium gray and light gray (N5-7), part nodular, fossiliferous (?), finely clastic to medium clastic with very finely clastic to some very finely crystalline matrix, about 30%; shale, very calcareous to slightly calcareous, greenish gray (5GY 6/1), very finely micaceous, about 20%.

- 2656 - 2666 Shale, silty, non-calcareous, dark grayish red (10R 3.5/2), micaceous, about 50%; shale, calcareous to non-calcareous, grayish red (10R 4/2), trace very finely micaceous material; some grayish red limestone.
- 2666 - 2672 Shale, dark grayish red, as above, part very silty, very micaceous, about 70% shale, grayish red, as above, part mottled with greenish gray shale, about 30%.
- 2672 - 2677 Siltstone, slightly calcareous, grayish red (10R 4/2), medium-grained, micaceous, about 35%; siltstone, greenish gray, (5GY 6/1), medium-grained, about 20%; shale, grayish red, very silty and non-silty, as above, about 45%
- 2677 - 2683 Limestone, medium gray (N5), medium clastic to some very finely clastic with part very finely crystalline, trace fossil fragments, about 40%; shale, non-calcareous to calcareous, medium dark gray (N4), slightly micaceous, about 20%; shale, dusky red purple (5RP 3/2), part very slightly calcareous, about 20%; shale, slightly calcareous to very slightly calcareous, grayish red (10R 4/2), very finely micaceous, about 20%.
- 2683 - 2685 Shale, silty, grayish red (10R 4/2), very micaceous, about 70% shale, dusky red purple (5RP 3/2), very finely micaceous, about 25%; limestone, shaly, medium light gray (N6), very finely clastic, very dense, about 5%.
- 2685 - 2692 Shale, dark greenish gray (5G 4/1), slightly micaceous, about 40%; shale, dark medium gray (N4.5), very slightly fissile, very finely micaceous, about 15%; shale, slightly to very slightly calcareous, grayish red, (10R 4/2), very finely micaceous, about 45%.
- 2692 - 2700 Shale, slightly silty to silty, grayish red (10R 4/2), very slightly calcareous, finely micaceous to micaceous.
- 2700 - 2708 Ditto, part very silty.

- 2708 - 2715 Shale, non-silty to silty, grayish purple (5P 4/2), very finely micaceous, about 50%; siltstone, calcareous, grayish red (10R 4/2), fine-grained, micaceous, about 25% siltstone, slightly calcareous to calcareous, medium light greenish gray (5GY 7/1), medium-grained, micaceous, about 25%.
- 2715 - 2722 Limestone, very shaly, dark gray (N3), finely clastic, with some very finely crystalline, part silty, fairly fossiliferous, about 50% shale, calcareous to very calcareous, dark gray (N3), about 50%.
- 2722 - 2729 Ditto, trace pyrite.
- 2729 - 2739 Shale, slightly to very slightly calcareous, dark greenish gray (5GY 4/1), very finely micaceous, about 60%; shale, non-silty to some silty, grayish red (5R 4/2), very finely micaceous, about 20%; shale and limestone, part medium clastic, dark gray (N3), as above, about 20%.
- 2739 - 2748 Shale, grayish red (5R 4/2), very finely micaceous, small part mottled with greenish gray shale.
- 2748 - 2754 Shale, grayish red (10R 4/2), very micaceous, about 40% shale; grayish red (5R 4/2), as above, about 40%; shale, very calcareous to slightly calcareous, medium gray (N5), about 10%; shale, greenish gray (5GY 6/1), resinous luster, about 10%.
- 2754 - 2760 Siltstone, calcareous to non-calcareous, grayish red (10R 4/2), medium-grained to coarse-grained, poorly sorted, micaceous, about 50%; shale, dusky red (5R 3/4), slightly resinous luster, trace very finely micaceous material, about 40% limestone, red (10R 5/2), about 5%.
- 2760 - 2765 Siltstone, very calcareous, red (10R 5/2), coarse-grained, micaceous, dark and green inclusions, about 50%; shale, grayish red (10R 4/2), about 15%; finely micaceous, shale, grayish red (5R 4/2), about 15%; limestone, shaly, medium dark gray (N4), medium clastic to finely clastic, about 20%.

- 2765 - 2772 Shale, grayish red (10R 4/2), part with resinous luster, part very finely micaceous, about 80%; shale, silty to non-silty, medium gray (N5), some mottled with grayish red shale, very finely micaceous to trace micaceous material, about 20%.
- 2772 - 2780 Siltstone, calcareous, grayish red (10R 4/2), fine-grained, dark inclusions, micaceous, about 50%; shale, grayish red, as above, about 50%.
- 2780 - 2789 Shale, very calcareous to non-calcareous, medium gray (N5), fossiliferous (ostracod), about 80%; siltstone, calcareous, medium gray to medium light gray (N5-6), medium-grained, micaceous, about 20%.
- 2789 - 2796 Shale, very silty to little non-silty, grayish red (10R 4/2), very slightly calcareous, micaceous.
- 2796 - 2800 Graywacke, slightly calcareous, dark pinkish gray (5YR 7/1), very fine-grained, subangular, poorly sorted, about 80% quartzose, dark gray and brown and some green (part Chlorite), inclusions, micaceous, silt and shale cement, moderately well cemented.
- 2800 - 2801 Ditto, very small clusters.
- 2801 - 2805 Ditto, clustered.
- 2805 - 2808 Graywacke, as above, and medium light greenish gray (5GY 8/1), as dark pinkish gray, well cemented.
- 2808 - 2812 Graywacke, light greenish gray (5GY 8/1), slightly calcareous, as above, moderately well to well cemented.
- 2812 - 2815 Graywacke, calcareous, slightly calcareous, as above.
- 2815 - 2818 Ditto, light gray (N7).
- 2818 - 2824 Shale, slightly silty to very slightly silty, medium gray (N5), very slightly fissile, micaceous.

2824 - 2833

Siltstone, slightly calcareous to non-calcareous, medium light gray (N6), coarse-grained, few dark inclusions, slightly micaceous, very well cemented, about 50%; shale, very silty to slightly silty, medium gray (N5), very slightly micaceous to micaceous, about 50%.

2833 - 2838

Shale, silty to slightly silty, dusky red purple (5RP 3/2), micaceous, about 50%; shale, medium dark greenish gray (5G 3/1), about 20%; shale, very silty to slightly silty, greenish gray (5GY 6/1), about 10% graywacke, calcareous, greenish gray (5GY 6/1), very fine-grained, micaceous, about 85% quartzose, moderately well cemented, about 20%; some light gray graywacke, very calcareous.

2838 - 2839

No sample.

2839 - 2843

Shale, dark gray (N3), very finely micaceous, about 20%; shale, medium dark gray (N4), silty to non-silty, medium dark gray (N4), very finely micaceous, about 30%; graywacke, very slightly calcareous, greenish gray, as above, about 30%; graywacke, slightly calcareous, very light gray (N8), very fine-grained, subangular, poorly sorted, about 95% quartzose (approaching quartzose sandstone), few dark inclusions, silty cement, about 20%.

2843 - 2849

Shale, silty, medium gray (N5), trace very finely micaceous material, about 50%; shale, dark gray (N3), part very carbonaceous, about 20% siltstone, greenish gray (5GY 6/1), very coarse-grained, micaceous, about 30%.

2849 - 2855

Shale, silty, medium-grained, very finely micaceous trace dark brownish gray (5YR 3/1), dense, very shaly limestone.

2855 - 2858

Graywacke, light gray, (N7), very fine-grained, about 90% quartzose, dark inclusions, micaceous, very slightly calcareous, silt and shale cement, about 70% shale, part carbonaceous, medium dark gray (N4), part slightly fissile, very finely micaceous, about 30%; trace coal and pyrite.

2858 - 2865

Shale, silty, medium dark gray (N4), finely micaceous, about 70% graywacke, medium light greenish gray (5GY 7/1), very fine-grained, subangular, poorly sorted, about 80% quartzose, dark inclusions, slightly micaceous, silt and shale cement, well cemented, about 30% trace pyrite.

2865 - 2869

Shale, slightly silty to non-silty, medium dark gray (N4), very finely micaceous, about 50% graywacke, greenish gray, very slightly calcareous, as above, about 50%

2869 - 2871

Graywacke, greenish gray (5GY 6/1), and some light gray (N7), as above, about 50%; shale, dark greenish gray (5GY 4/1), very finely micaceous, about 25% shale, dark gray (N3), slightly micaceous, about 25% little greenish gray siltstone, trace coal and pyrite.

2871 - 2873

Graywacke, greenish gray (5GY 6/1), and part slightly calcareous, light gray (N7), very fine-grained (approaching siltstone), subangular, poorly sorted, about 80% quartzose, dark and some minute green inclusions, micaceous, trace pyrite.

2873 - 2879

Shale, dark greenish gray (5GY 4/1), very slightly calcareous, very finely micaceous.

2879 - 2883

Shale, slightly calcareous, medium gray (N5), dark greenish gray (5GY 4/1), and brownish gray (5YR 4/1), very finely to finely micaceous.

2883 - 2889

Shale, grayish red (5R 4/2), very finely micaceous, about 30%; shale, as above, about 70%; small fragments.

2889 - 2894

Shale, dark greenish gray (5GY 4/1), very slightly calcareous, trace very finely micaceous material, about 50%; shale, medium dark gray and dark gray (N4@3), trace very finely micaceous material to very finely micaceous, about 30%; limestone, shaly, medium dark gray, very finely clastic to part very finely crystalline, about 20%; slightly trace pyrite.

- 2894 - 2900 Limestone, slightly shaly, medium dark gray (N4), slightly mottled, with light gray, very finely clastic, part slightly nodular, about 50%; shales, as above, about 50%.
- 2900 - 2904 Shale, silty to slightly silty, medium gray (N5), slightly micaceous, considerable chert in sample, very light gray (N8), and pinkish gray (5YR 8/1), medium-grained.
- 2904 - 2909 Shale, silty to very silty, medium gray (N5), micaceous; little shaly siltstone.
- 2909 - 2915 Graywacke, medium light gray (N6), very slightly calcareous, very fine-grained, subangular, poorly sorted, about 80% quartzose, dark inclusions, slightly micaceous, silt and shale cement, moderately well to well cemented, about 60%; shale, slightly calcareous to calcareous, medium dark gray (N4), very finely micaceous, about 40%.
- 2915 - 2920 Ditto, graywacke, very slightly calcareous to calcareous; trace pyrite.
- 2920 - 2925 Shale, very calcareous, to non-calcareous, medium dark gray (N4), trace micaceous material, about 50%; limestone, very shaly, medium dark gray (N4), very finely clastic to small part very finely crystalline, very dense.
- 2925 - 2930 Coal, shaly, part fissile, about 20%, shale, medium dark gray (N4), very finely micaceous, about 80%; trace pyrite.
- 2930 - 2936 Graywacke, medium light gray (N6), very fine-grained (approaching siltstone), subangular, poorly sorted, about 80% quartzose, dark peppering, micaceous, moderately well to well cemented, about 30%; shale, dark greenish gray (5GY 4/1), about 50%; shale, medium dark gray, as above, about 20%, trace pyrite.

2936 - 2938

Graywacke, calcareous to non-calcareous, and greenish gray (N7-5GY 6/1), very fine-grained (approaching siltstone), subangular, poorly sorted, about 80% quartzose, dark and some green peppering, slightly micaceous to micaceous, moderately well to well cemented, about 60%; shale, greenish gray, as above, about 30%; shale, medium dark gray, as above, about 10%; considerable pyrite.