

INTERVAL SHEET

WWCR 53

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VDMR WELL NO.: Well No. 1180

Date 11/12/64

Sample Interval: from 1 to 752

PROP: General Products Co.

Total Depth 752

COMP: Douglas & Dickinson, Inc.

Oil Gas Water Exploratory

COUNTY: King George (Dahlgren)

Cuttings Core Other

VDMR WELL NO: W-1180

From-To	From-To	From-To	From-To	From-To
1 - 10	315 - 325	630 - 640	No samples washed	
10 - 21	325 - 336	640 - 651	-	-
21 - 31	336 - 347	651 - 661	-	-
31 - 42	347 - 357	661 - 672	-	-
42 - 52	357 - 367	672 - 682	-	-
52 - 63	367 - 378	682 - 693	-	-
63 - 73	378 - 388	693 - 703	-	-
73 - 84	388 - 399	703 - 714	-	-
84 - 94	399 - 409	714 - 724	-	-
- 105	409 - 420	724 - 735	-	-
105 - 115	420 - 430	735 - 743	No sample	-
115 - 126	430 - 441	743 - 752	-	-
126 - 136	441 - 451	-	-	-
136 - 147	451 - 462	-	-	-
147 - 157	462 - 472	-	-	-
157 - 168	472 - 483	-	-	-
168 - 178	483 - 493	-	-	-
178 - 189	493 - 503	-	-	-
189 - 199	503 - 514	-	-	-
199 - 210	514 - 525	-	-	-
210 - 220	525 - 535	-	-	-
220 - 231	535 - 546	-	-	-
231 - 241	546 - 556	-	-	-
241 - 252	556 - 567	-	-	-
252 - 262	567 - 577	-	-	-
262 - 273	577 - 588	-	-	-
- 283	588 - 598	-	-	-
283 - 294	598 - 609	-	-	-
294 - 304	609 - 619	-	-	-
304 - 315	619 - 630	-	-	-

OWNER: General Products Company
DRILLER: Douglas & Dickinson, Incorporated
COUNTY: King George

VDMR #1180
WWCR # 53
TOTAL DEPTH: 752'

GEOLOGIC LOG

- 1-10 Clay - buff, with lesser amount gray clay, sandy (sand is very slightly glauconitic), small amounts garnet, muscovite, ferruginous - limonite abundant, moderate amount plant material.
- 10-21 Clay - buff, with lesser amount gray clay, sandy (sand is very slightly glauconitic), small amount phosphate nodules, and quartz granules, ferruginous (limonitic), abundant plant material includes twigs and what appear to be deciduous leaves and insect carapaces.
- 21-31 Clay - dark gray, with relatively small amount yellow clay, very sandy - sand is very fine grained, very well sorted, moderately micaceous (muscovite), slightly ferruginous (limonitic), small amount plant material.
- 31-42 As above.
- 42-52 Sand - gray, very fine to very coarse grained, poorly sorted, subangular to subrounded, sand is glauconitic (5-10%), slightly to moderately argillaceous-gray and yellow (limonitic) clay, pebbly-abundant small gravel (up to 25 mm), small amounts phosphate nodules, muscovite, plant material, trace of shell material.
- 52-63 As above.
- 63-73 Gravel - brownish-gray, subrounded pebbles, up to 15 mm, mostly quartz, but some rock fragments, sand matrix is medium-to-coarse grained, rather poorly-sorted, trace of glauconite and muscovite, moderately argillaceous.
- 73-84 As above.
- 84-94 Sand - gray, very fine to very coarse grained, poorly sorted, subangular, argillaceous (abundant gray clay), pebbly (abundant subrounded quartz and rock fragments, 4-30 mm in diameter), sand is glauconitic (10% +) and micaceous (abundant muscovite), moderately abundant plant remains.

- 94-105 Sand - gray, very fine to very coarse grained, fairly well sorted (skewed to fine grades), subangular, argillaceous (gray clay), pebbly (abundant subrounded to rounded quartz, 4-30 mm in diameter), glauconitic, micaceous, small amount plant remains.
- 105-115 Sand - dark gray, very fine to fine grained, well sorted, angular to subangular (quartz fraction), very argillaceous (grayish-brown clay), slightly pebbly (small amount subangular to subrounded quartz pebbles), glauconitic (35-45%), moderately micaceous (muscovite), chalky white clay, small amounts plant remains (twigs, deciduous leaves) and calcareous.
- 115-126 As above.
- 126-136 Sand - dark gray, poorly sorted, angular to subangular, very argillaceous (gray clay), a few quartz pebbles, glauconitic (estimate of % difficult because clay is so comprehensive), abundant muscovite, small amounts limonite and calcareous, friable, white clay, trace of pyrite, small amount plant remains and trace of pelecypods.
- 136-147 As above.
- 147-157 Clay - gray and pink (gray clay predominant), sandy (sand is slightly to moderately glauconitic, micaceous), abundant shell fragments (pelecypods) in form of chalky white clay.
- 157-168 Clay - pink and gray (pink clay predominant), pink clay, gray clay, and small amounts of limonitic clay are interlaminated, pink layers are sand free (100% clay), gray clay is sandy, glauconitic, micaceous, small % discrete particles of chalky white clay, small amount plant remains.
- 168-178 Clay - gray and pink (gray clay predominant), very sandy, same as above, but gray clay is much more abundant and limonitic clay is more abundant.
- 178-189 Sand - dark gray, very fine to fine grained, well sorted, subangular (quartz fraction), argillaceous (abundant dark gray, somewhat silty clay, and small amount pink, sand-free clay), glauconite (55-65% of sand fraction), moderate amount chalky white clay, small amounts limonite, muscovite.

- 189-199 Sand - dark gray, very fine grained, well sorted, angular to subangular (quartz component), very argillaceous (dark gray clay predominates and serves as matrix to very glauconitic and micaceous sand, lesser amounts pink, sand-free clay, and yellow, limonitic, sandy clay), a few scattered quartz pebbles, total sand fraction is 35-45% glauconite, abundant gastropods and scattered pelecypods, plant remains, and insect carapaces, all shell material is in form of chalky white clay.
- 199-210 As above, but with much more pink, sand-free clay.
- 210-220 Sand - dark gray, very fine to fine grained, well sorted, very argillaceous (gray clay), glauconitic (35-45% of sand fraction), quartz component of sand fraction (35-65%) is subangular, coarser, and more poorly sorted than glauconite component, abundant muscovite, moderate amount plant remains (twigs, deciduous leaves, moderate amount shell material in form of chalky white clay includes pelecypods, a few gastropods and possibly solitary corals).
- 220-231 Sand - dark gray, very fine to medium grained, fairly well sorted, argillaceous (gray clay), glauconitic (40-50% of sand fraction), quartz component of sand fraction (50-60%) is subangular, coarser grained, and more poorly sorted than glauconite, much of quartz is tinted green, moderate amount muscovite, abundant plant remains, moderate amount shell material, both chalky, clayey fragments and more coherent, crystalline fragments of pelecypods, gastropods, and a few foraminifera.
- 231-241 Sand - gray, extremely argillaceous, a few quartz pebbles, sand consists of glauconite and greenish quartz in subequal amounts and is moderately micaceous, clay is predominantly gray with lesser amount of light yellow to buff sandy clay and a very small amount of pink sand-free clay, small amount plant remains, small amount shell fragments (mostly pelecypods, but a few gastropods and foraminifera).
- 241-252 As above, but with scattered phosphate nodules.
- 252-262 Sand - brown and gray, fine to medium grained, fairly well sorted, subangular to subrounded, very argillaceous, moderately silty, glauconitic (25-35% of sand fraction), moderately micaceous (muscovite), dark gray clay predominant, small amount of yellow-brown (limonitic) clay and moderate amount buff, sandy clay, much quartz is limonite stained, very ferruginous, a few pelecypod shell fragments.

- 262-273 Sand - dark gray, fine to medium grained, fairly well sorted, subangular (quartz component), slightly argillaceous, slightly silty, sand consists of glauconite (35-45%) and quartz (55-65%), much of which is tinted green, a small % of quartz sand is well-rounded, moderate amount muscovite, and of hematite-limonite goethite that locally cements sand grains, small amount phosphate, moderate amount pelecypod fragments, and scattered plant remains.
- 273-283 Clay - gray, mottled yellowish brown, sandy (sand is glauconitic and micaceous possibly muscovite), ferruginous (mostly limonite, but some hematite), trace of phosphate, small amount limonite as pseudomorphs after columnar goethite, small amount shell material, both chalky white fragments and coherent, crystalline fragments (pelecypods).
- 283-294 As above.
- 294-304 As above - more ferruginous (limonitic).
- 304-315 Sand - dark brown, fine to very coarse grained, poorly sorted, angular to subangular, argillaceous, small amount of granules, sand is slightly glauconitic and slightly arkosic, clay is gray and yellowish brown, ferruginous (limonite and hematite present in abundance as friable lumps, most of quartz and feldspar is stained yellow or red), moderate amount of chalky, white, unidentifiable shell fragments.
- 315-325 Sand - brown, very fine to medium grained, fairly well sorted, subangular, extremely argillaceous, sand is slightly glauconitic and slightly arkosic, clay is gray (relatively sand-free) and yellowish brown, ferruginous, but less so than preceding sample (abundant limonite as ferruginous clay, quartz and feldspar are limonite-stained, but hematite is much less abundant than in preceding sample), small amounts chalky shell fragments, plant remains.
- 325-336 Clay - dark brown, under microscope is seen to be variegated (grays, reds, yellow, and browns), sandy, glauconitic, micaceous, ferruginous (limonitic, hematitic), small amounts shell fragments, including scattered gastropods, and plant remains.
- 336-347 Sand - brown, very fine to medium grained, fairly well sorted, subangular, extremely argillaceous, sand is slightly glauconitic and slightly arkosic, clay is grey (relatively sand-free) and yellowish brown, ferruginous, but less so than preceding sample

- 336-347 (abundant limonite as ferruginous clay, quartz and feldspar are limonite-stained, but hematite is much less abundant than in preceding sample), small amounts chalky shell fragments, plant remains.
- 347-357 Sand - brown, very fine to medium grained, fairly well sorted, subangular, extremely argillaceous, sand is slightly glauconitic and slightly arkosic, clay is gray (relatively sand-free) and yellowish brown, ferruginous, but less so than preceding sample (abundant limonite as ferruginous clay, quartz and feldspar are limonite-stained, but hematite is much less abundant than in preceding sample), small amounts chalky shell fragments, plant remains.
- 357-367 Sand - brown, fine to medium grain, fairly well sorted, subangular, very argillaceous, sand is slightly to moderately glauconitic, arkosic (microcline), moderately micaceous, clay is variegated, predominantly gray and yellow (limonitic), ferruginous, (limonitic, hematitic to lesser degree), small amount chalky shell fragments.
- 367-378 Clay - brown, under microscope, is seen to be variegated (grays, reds, yellows, and browns), sandy (sand is fine grained, poorly sorted, angular to subangular), slightly glauconitic and micaceous, moderately arkosic, ferruginous (limonitic, hematitic), small amount chalky shell fragments, including pelecypods and gastropods.
- 378-388 Clay - brown, under microscope, is seen to be variegated (grays, reds, yellows, and browns), sandy (sand is slightly glauconitic and micaceous, moderately arkosic, ferruginous (limonitic, hematitic), small amount chalky shell fragments and plant remains.
- 388-399 Sand - dark brown, fine to medium grained, well sorted, subangular, very argillaceous, sand is glauconitic, arkosic, moderately micaceous (muscovite), clay is ferruginous and variegated (limonitic, hematitic) as in preceding intervals, small amount chalky shell fragments.
- 399-409 Clay, brown, under microscope, is seen to be variegated (grays, reds, yellows, and browns), sandy (sand is slightly glauconitic and micaceous, moderately arkosic, ferruginous (limonitic, hematitic), small amount chalky shell fragments and plant remains.

- 409-420 Sand - brown, very fine to fine grained, fairly well sorted, subangular, very argillaceous, sand is slightly glauconitic, very arkosic, moderately micaceous (muscovite), clay is ferruginous and variegated (grays, reds, yellows, and browns), and subordinate amounts of both white and of pinkish orange clay derived from decomposition of feldspars.
- 420-430 Sand - brown, very fine to coarse grained, poorly sorted, angular to subangular, argillaceous, sand is slightly glauconitic, very arkosic, moderately micaceous (muscovite), clay is ferruginous and variegated (as above), trace of plant remains.
- 430-441 Sand - brown, poorly sorted, subangular, extremely argillaceous, sand is slightly glauconitic, very arkosic, and moderately micaceous, clay is ferruginous and variegated (as above), a few chalky, white shell fragments, a few plant remains.
- 441-451 As above.
- 451-462 As above, but with a few quartz granules and pebbles.
- 462-472 Clay - brown, under microscope is seen to be extremely variegated (gray, bluish gray, greenish gray, purple, reds, yellows, browns), ferruginous, slightly sandy (sand is arkosic and slightly glauconitic), small amount plant remains.
- 472-483 As above.
- 483-493 Clay - brown, under microscope is seen to be extremely variegated (gray, bluish gray, greenish gray, purple, reds, yellows, browns), ferruginous, slightly sandy (sand is arkosic and slightly glauconitic), small amount plant remains.
- 493-503 As above.
- 503-514 Sand - brown, very fine to very coarse grained, rather poorly sorted (actually bimodal with good sorting around both coarse and fine modes), subangular, slightly to moderately argillaceous, gray clay and ferruginous clay (limonitic and subordinately hematitic), quartz with purple cast is very abundant, extremely arkosic (feldspar is white, relatively fresh sodic plagioclase and subordinate microcline, very abundant in general and predominant in the fine fractions), trace of muscovite.

- 514-525 Clay - brown, under microscope is seen to be variegated (gray and yellowish brown clays predominant, lesser amounts green and red clays), sandy material (as above).
- 525-535 Clay - brown, with purplish cast, under microscope is seen to be variegated (gray clay predominant, lesser amounts of yellowish brown and red clays), sandy material (as above), but is more arkosic and very slightly glauconitic, ferruginous (limonitic and hematitic).
- 535-546 As above.
- 546-556 As above.
- 556-567 As above.
- 567-577 As above.
- 577-588 As above.
- 588-598 As above.
- 598-609 As above.
- 609-619 Clay - brown, under microscope is seen to be extremely variegated (gray, bluish gray, greenish gray, purple, reds, yellows, browns), sandy (sand is poorly sorted, angular), arkosic (feldspar is relatively fresh, white, sodic plagioclase and microcline), much of quartz component has purple cast, ferruginous (limonitic and hematitic clays and small amount of columnar goethite partially altered to limonite), small amounts muscovite and glauconite.
- 619-630 Clay - as above, but with a slightly greater sand/clay ratio.
- 630-640 Clay - as above, but with a greater sand/clay ratio.
- 640-651 Clay - as above.
- 651-661 Sand - gray, medium to very coarse grained, fairly well sorted, angular to subangular, slightly argillaceous (gray clay with lesser amounts red and yellowish brown ferruginous clays), extremely arkosic (fresh, white sodic plagioclase and microcline), slightly glauconitic and micaceous (muscovite), abundant granular hematite, purplish quartz much less abundant than in overlying 150'.

- 661-672 Sand - brown, medium to very coarse grained, fairly well sorted, subangular, slightly to moderately argillaceous (clay is predominantly gray, with lesser amounts of reds, yellows, and browns), moderately arkosic (fresh, white sodic plagioclase and microcline), much of quartz component has purplish cast, very small amounts glauconite and muscovite, ferruginous (hematitic and limonitic).
- 672-682 As above.
- 682-693 As above.
- 693-703 Clay - brown, under microscope is seen to be extremely variegated (grays, reds, yellows, browns, white), moderately sandy (sand contains abundant fresh, white feldspar and purplish quartz, ferruginous).
- 703-714 As above.
- 714-724 As above.
- 724-735 As above.
- 735-743 No sample (listed as water-bearing sand on driller's report).
- 743-752 Clay - brown, under microscope is seen to be extremely variegated (grays, reds, yellows, browns, white), moderately sandy (sand contains abundant fresh, white feldspar and purplish quartz, ferruginous).

GEOLOGIC SUMMARY

	<u>ROCK UNIT</u>	<u>AGE</u>
0-156	Nanjemoy	Eocene
156-273	Aquia	Paleocene-Eocene
273-651	Patapsco	Lower Cretaceous
651-752	Patuxent	Lower Cretaceous

Virginia Division of Mineral Resources
 Robert H. Teifke, Geologist
 December 9, 1964