

OWNER: Colonial Williamsburg - Well "H"  
DRILLER: Sydnor Pump & Well Co., Inc.  
COUNTY: James City

VDMR #1292  
WWCR #151  
TOTAL DEPTH: 501'

GEOLOGIC LOG

0-14 No sample.

Chesapeake Group (14-270')

- 14-20 Sand — brown; medium-grained, moderately sorted, sub-angular; small amounts of glauconite (partially oxidized), chert (pink, rounded grains), phosphorite (black to brown, platy), magnetite, garnet (pink); epidote (brown and green); traces of pyrite and biotite; very fossiliferous with foraminifera and ostracods dominant Amphistegina predominant, Auvilia abundant, Nonian, Globigerina, Orionina, Murrayina, Acuticythereis, and others; pelecypods common, echinoid spines (two types) common, trochoid gastropods (several types) common, scaphopods common, bryozoans and fish teeth rare.
- 20-30 Sand — gray; medium-grained, moderately sorted, angular to sub-angular; moderate amounts of glauconite (fresh, dark-green), grains of white calcareous clay (shell ?), much of it crowded with very fine-grained glauconite; small amount of dark-brown to black, platy phosphorite, and traces of garnet, epidote, and pyrite; extremely fossiliferous, with extremely abraded pelecypod shells dominant, trochoid gastropods abundant, echinoid spines abundant, bryozoans common, scaphopods common, foraminifera abundant — Quingueloculina and Massilina predominant, Textularia, Nonion, Amphistegina; some ostracods — Murrayina and Aurilia and others.
- 30-40 Sand — gray; medium-grained, moderately sorted, angular to sub-angular; very clear quartz with small amounts of dark-green glauconite and platy, brown to black phosphorite (shell), grains of white calcareous clay with included glauconite; traces of garnet and epidote (brown); fossiliferous, with abraded bluish-gray to chalky pelecypod shell fragments dominant, bryozoans, gastropods, echinoid spines and plate fragments and abundant, some worm tubes and corals, some foraminifera, mostly Amphistegina and Nonion, and a few ostracods.
- 40-50 As above — but less fossiliferous.
- 50-60 Shell and Sand — brown; abraded pelecypod shell fragments and coarse- to very-coarse-grained, moderately sorted, subangular quartz sand are dominant components (shells more abundant); small amounts of glauconite, and brown, platy phosphorite; traces of garnet and brown to yellow epidote; fossil assemblage includes gastropods (several types), echinoid spines and plate fragments, bryozoans, corals, and a few foraminifera, mostly Amphistegina.

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- 60-70 Sand and Shell — gray; fine- to medium-grained, well sorted, angular to subangular, clear to green-tinted quartz and a small amount of glauconite, and abundant abraded pelecypod shell fragments (sand more abundant); small amount phosphorite and hornblende; traces of garnet and brown epidote; fossil assemblage includes corals, gastropods, bryozoans, and echinoid spines; microfossils rare.
- 70-80 As above — but with much less shell material.
- 80-90 Sand and Shell — gray; subequal amounts of fine- to medium-grained, well-sorted, subangular, clear to green-tinted quartz, and abraded pelecypod shell fragments; small amounts glauconite and phosphorite; traces of garnet and green and brown epidote; scattered echinoid spines.
- 90-100 As above — but with more shell and less sand.
- 100-110 Sand — gray; fine- to medium-grained, well-sorted, angular; very slightly glauconitic and phosphoritic; moderate amount pelecypod shell fragments, scattered echinoid spines.
- 110-120 As above.
- 120-130 Sand and Shell — gray; fine-grained, well-sorted, angular quartz sand, and abundant abraded pelecypod shell fragments; small amounts of glauconite and black phosphorite.
- 130-140 Sand — gray; slightly silty and argillaceous; fine-grained, well-sorted, angular; very slightly glauconitic and phosphoritic (pellets and plates); traces of garnet and green and brown epidote; moderate amount abraded pelecypod fragments, and occasional ostracods, fish teeth, echinoid spines.
- 140-150 As above — but virtually unfossiliferous.
- 150-160 Sand — gray; moderately silty and argillaceous; fine-grained, moderately sorted, angular; slightly glauconitic and phosphoritic, trace of green and brown epidote; moderate amount of abraded pelecypod shell fragments, scattered echinoid spines and foraminifera.
- 160-170 As above.
- 170-180 As above — but less silty and argillaceous, and less shell material.
- 180-190 Sand — gray; slightly silty and argillaceous; fine-grained, well-sorted, angular; slightly glauconitic and phosphoritic; abundant abraded pelecypod shell fragments.

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- 190-200 Sand — gray; slightly silty and argillaceous; fine-grained, well-sorted, angular; slightly glauconitic and phosphoritic; moderately abundant shell material, scattered aragonite needles and a few foraminifera, (planospiral involute, and uniserial types).
- 200-210 Sand and Shell — gray, very slightly silty; subequal amounts of fine-grained, well-sorted, angular to subangular quartz sand, and abraded pelecypod shell fragments; very small amounts of glauconite, fine-grained pyrite, and phosphorite; occasional foraminifera.
- 210-220 Sand — grayish-green; slightly to moderately silty and argillaceous; very-fine- to medium-grained, poorly to moderately sorted, angular to subangular; very small amounts glauconite, phosphorite, pyrite, epidote; abundant abraded pelecypod shell fragments; diatoms.
- 220-230 Clay - Sand - Shells — greenish-gray; clay fraction green, and contains abundance of finely divided glauconite and pyrite; sand fine- to coarse-grained, moderately to poorly sorted, subangular to subrounded and contains small amounts of glauconite and yellow-brown to black phosphorite in pellets and plates; traces of garnet and epidote; abundant, coarse pelecypod shell fragments; slightly diatomaceous; scattered foraminifera, mostly infilled with fine-grained pyrite.
- 230-240 No sample.
- 240-250 Clay — greenish-gray; slightly sandy (clear, angular, poorly sorted quartz); small amount of platy gray to yellowish-brown phosphorite; trace of garnet; scattered pelecypod shell fragments, abundant foraminifera (many genera), diatomaceous.
- 250-260 Sand — greenish-gray; moderately argillaceous; very-fine- to very-coarse-grained, poorly sorted, angular to subrounded, clear quartz; small amount platy yellowish-brown phosphorite and acicular aragonite; traces of glauconite and garnet; scattered pelecypod shell fragments, some echinoid spines, a few foraminifera and an occasional ostracod and fish teeth; very slight diatomaceous; Robulus.
- 260-270 Sand — gray; slightly argillaceous; fine- to coarse-grained, poorly sorted, subangular clear quartz; moderate amount platy brown to black chitino-phosphatic material, small amounts of glauconite and limonite after glauconite, scattered needles of aragonite; traces of garnet and pyrite; considerable amount of chalky white to yellowish carbonate containing grains of glauconite in various stages of alteration; abundant comminuted shell material and larger fragments of pelecypods and gastropods, scattered echinoid spines; very slightly diatomaceous.

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Pamunkey Group (270-410')

- 270-280 Marl and Sand — yellowish to chalky-white carbonate cementing sand grains (grains not in contact) of limonite after glauconite, quartz, and glauconite; small amounts phosphorite and pyrite; some bryozoans and pelecypod fragments, scattered echinoid spines.
- 280-290 Sand — dark-gray; argillaceous; fine- to coarse-grained; poorly sorted sand consisting in order of abundance, pelletal limonite (pseudomorphous after glauconite), subrounded to rounded quartz (deeply stained to yellow and brown), and glauconite; small amount phosphorite, trace of muscovite; scattered granules and small pebbles of quartz; scattered pelecypod shell fragments, echinoid spines, bryozoans, and poorly preserved foraminifera; rare fish teeth.
- 290-300 As above.
- 300-310 As above.
- 310-320 As above.
- 320-330 As above.
- 330-340 As above.
- 340-350 As above.
- 350-360 Sand — dark-gray to black; very slightly argillaceous; sand consists of medium- to coarse-grained fresh glauconite (65-75%), fine- to coarse-grained, angular to rounded quartz (25-35%), and small amount limonite after glauconite; traces of vivianite, acicular aragonite, muscovite, and garnet; scattered pelecypod shell fragments, bryozoans, echinoid spines and poorly preserved foraminifera.
- 360-370 As above.
- 370-380 As above.
- 380-390 Sand — black; trace of clay and granules; medium- to coarse-grained, well-sorted fresh black to green glauconite (85-90%), and fine- to coarse-grained, moderately sorted, angular to subangular, clear to slightly stained quartz (10-15%); traces of pyrite, garnet, phosphorite; a few pelecypod shell fragments and foraminifera.

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- 390-400 Sand — gray ("salt-and - pepper"); medium-grained, well-sorted, fresh black to green glauconite (60-65%), and fine- to coarse-grained, moderately sorted, subangular to subrounded, clear to milky quartz (35-40%); slightly arkosic (microcline); small amount pink garnet.
- 400-410 Sand — gray ("salt- and - pepper"); medium-grained, well-sorted, fresh glauconite (25-30%), very-fine- to coarse-grained, poorly sorted, angular to subrounded clear quartz (60-65%), and fresh gray to white feldspar (mostly microcline) (5-10%); small amounts of muscovite and pink and salmon garnet.
- Potomac Group (410-500')
- 410-420 Sand — light-gray; very slightly pebbly (subrounded quartz and subrounded to rounded feldspar from 2-5 mm); fine- to very-coarse-grained (skewed coarse), rather poorly sorted; angular to subangular clear quartz (70-75%); subrounded to rounded, white to gray, moderately decomposed potash feldspar (20-25%), and fine- to medium-grained, well sorted, fresh glauconite (5%); small amounts muscovite, pink garnet, pyrite.
- 420-430 Sand — gray; very slightly silty, slightly pebbly (granules of subrounded quartz and some of potash feldspar); fine- to very-coarse-grained, poorly sorted, angular to subrounded; quartz, mostly clear but some stained yellow or green (glauconite inclusions); dull white (microperthite) to gray (microcline) feldspar more rounded than quartz (10-15%); and medium-grained, well-sorted glauconite (5+ %); moderate amount of limonite after glauconite; small amounts pyrite, brown epidote with apague inclusions, pink and salmon garnet and muscovite; trace of vivianite and tourmaline; trace of shell material, mostly echinoid spines.
- 430-440 As above.
- 440-450 As above.
- 450-460 Sand — gray; medium- to very-coarse-grained, moderately well sorted, subangular to subrounded; clear quartz (80-85%); dull white, fresh, microcline and microperthite (10-15%); and minor glauconite and limonite after glauconite; small amounts garnet, muscovite, and brown epidote; trace of shell material.
- 460-470 As above — but less feldspathic, and more poorly sorted.
- 470-480 Sand — gray ("salt - and - pepper"); very slightly silty and argillaceous; fine- to coarse-grained, poorly sorted; angular to subangular clear quartz (65-75%), and glauconite (25-35%); moderate amount limonite after glauconite; small amount feldspar (about 5%); traces of garnet and aragonite needles; an occasional echinoid spine,

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- 470-480 (Continued) pelecypod shell fragment, and foraminifera.
- 480-490 Sand — brownish-gray; moderately silty and argillaceous; fine- to coarse-grained, poorly sorted, angular to subrounded; clear to yellow- and green-stained quartz (60-70%), and black to light-green glauconite (30-35%); subordinate amounts of limonite after glauconite, and of weathered feldspar, traces of garnet, epidote, acicular aragonite, muscovite, and phosphorite; small of chalky shell material (including coral and pelecypod).
- 490-500 As above — but more argillaceous and calcitic, with carbonate acting as cement to quartz-glauconite sand.
- 500-501 No sample.

GEOLOGIC SUMMARY

	<u>ROCK UNIT</u>	<u>TIME ROCK UNIT</u>
0-14	No sample	
14-270	Chesapeake Group	Miocene
270-410	Pamunkey Group	Eocene-Paleocene
410-500	Potomac Group	Lower Cretaceous
500-501	No sample	

Virginia Division of Mineral Resources  
Robert H. Teifke, Geologist  
May 3, 1965