

INTERVAL SHEET

WWCR 169

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VDMR Well No: 1547

Date rec'd: 3/31/66

Sample Interval: from 0 to 1020

PROP: City of Norfolk #2 (Lake Prince #3)

Number of samples: 101

COMP: Layne & Bowler, Inc.

Total Depth: 1020

COUNTY: Nansemond (Suffolk)

Oil or Gas: Water: ~~X~~Exploratory:

From-To	From-To	From-To	From-To
0 - 10	300 - 310	600 - 610	900 - 910
10 - 20	310 - 320	610 - 620	910 - 920
20 - 30	320 - 330	620 - 630	920 - 930
30 - 40	330 - 340	630 - 640	930 - 940
40 - 50	340 - 350	640 - 650	940 - 950
50 - 60	350 - 360	650 - 660	950 - 960
60 - 70	360 - 370	660 - 670	960 - 970
70 - 80	370 - 380	670 - 680	970 - 980
80 - 90	380 - 390	680 - 690	980 - 990
90 - 100	390 - 400	690 - 700	990 - 1000
100 - 110	400 - 410	700 - 710	1000 - 1010
110 - 120	410 - 420	710 - 720	1010 - 1020
120 - 130	420 - 430	720 - 730	-
130 - 140	430 - 440	730 - 740	-
140 - 150	440 - 450	740 - 750	-
150 - 160	450 - 460	750 - 760	-
160 - 170	460 - 470	760 - 770	-
170 - 180	470 - 480	770 - 780	-
180 - 190	480 - 490	780 - 790	-
190 - 200	490 - 500	790 - 800	-
200 - 210	500 - 510	800 - 810	-
210 - 220	510 - 520	810 - 820	-
220 - 230	520 - 530	820 - 830	-
230 - 240	530 - 540	830 - 840	-
240 - 250	540 - 550	840 - 850	-
250 - 260	550 - 560	850 - 860	-
260 - 270	570 - 580	860 - 870	-
270 - 280	580 - 590	870 - 880	-
280 - 290	590 - 600	880 - 890	-
290 - 300	-	890 - 900	-

Only unwashed samples for 900-910 and 910-920

All other intervals have both washed and unwashed samples

OWNER: City of Norfolk #2 (Lake Prince #3)
DRILLER: Layne Arkansas
COUNTY: Nansemond (Suffolk)

VDMR: 1547
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TOTAL DEPTH: 1020'

GEOLOGIC LOG

Depth in feet

COLUMBIA GROUP (0-20')

0-10 Sand - tan, clean; fine- to medium-grained, well-sorted, sub-angular; 5-10% shell debris - pelecypods, gastropods, echinoid spines, and foraminifers

10-20 " 20-25% shell debris

YORKTOWN FORMATION (20-240')

20-30 Sand, Clay, and Shell - gray, a very few pebbles; subequal amounts of fine-grained, well-sorted, angular quartz sand, gray clay, and shell - pelecypods, gastropods, echinoid spines, and some foraminifers and ostracods

30-40 " 60-70% sand, 30-40% shell, very little clay

40-50 " 70% sand, 25% clay, 5% shell; foraminifers, echinoid spines, and ostracods abundant

50-60 " 50% sand, 30% shell, 20% clay

60-70 " 60% sand, 30% clay, 10% shell

70-80 " 60% sand, 25% clay, 15% shell

80-90 " "

90-100 Sand - gray, moderately argillaceous; fine- to coarse-grained, fairly well-sorted, angular to subrounded; clear quartz with about 20% fresh glauconite; trace of pyrite; less than 5% shell debris - pelecypods gastropods, echinoid spines and plates, and some ostracods and foraminifers

100-110 "

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110-120	Sand - gray, with greenish cast, slightly argillaceous; fine- to medium-grained, fairly well-sorted, angular to slightly subrounded, clear to green-tinted quartz; about 10% fresh glauconite; about 5% shell fragments - pelecypods, gastropods, echinoid spines, and a few foraminifers and ostracods
120-130	" less than 5% glauconite, 15% shell fragments, microfossils scarce
130-140	" less than 5% each of glauconite and shell fragments, microfossils scarce
140-150	" "
150-160	" 5% glauconite, 15% shell fragments
160-170	" about 10% glauconite, about 15% shell fragments, microfossils rare
170-180	" "
180-190	" "
190-200	" "
200-210	" about 15% shell fragments
210-220	" "
220-230	Sand - gray, moderately argillaceous; very fine to medium-grained, rather poorly-sorted, angular to subangular; less than 5% glauconite; traces of phosphorite and muscovite; 15-20% shell fragments - pelecypods, gastropods, echinoid spines and a few fish teeth

230-240

"

CALVERT FORMATION (240-300')

240-250 Sand - gray, slightly argillaceous; fine- to medium-grained, fairly well-sorted, subangular; 1-2% each of glauconite and platy black to brown phosphorite; about 5% shell - pelecypods, gastropods, scaphopods, corals, fish teeth and vertebrae, and a varied assemblage of foraminifers (including Textularia)

250-260

"

260-270

"

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- 270-280 Sand - dull brown, slightly argillaceous; fine- to coarse-grained, moderately-sorted, angular (fine) to rounded and polished (coarse); clear quartz with about 5% gray and brown platy phosphorite and a trace of glauconite; about 15% shell fragment - pelecypods, a few gastropods, scaphapods, echinoid spines, corals, worm tubes, shark teeth, vertebrae, and large foraminifers
- 280-290 " coarser grained, more brown phosphorite
- 290-300 Sand - brownish gray, slightly argillaceous; coarse- to very-coarse grained, subrounded to rounded, polished; clear quartz with about 2% phosphorite and a trace of glauconite; small amount of shell material including phosphatic vertebrate fragments and a few foraminifers and ostracods

MATTAPONI FORMATION (300-340')

- 300-310 Sand - brownish gray, slightly silty and argillaceous; very fine- to very-coarse grained, rather poorly-sorted (skewed coarse), angular to subrounded; clear quartz with about 20% green and brown glauconite (and iron oxides after glauconite); small amounts of garnet, pyrite, and platy phosphorite; small amount shell including pelecypods, echinoid spines, vertebrae, and shark teeth
- 310-320 Sand - black, very slightly argillaceous; coarse-medium to very coarse-grained, well-sorted; 15-20% coarse- to very-coarse, subrounded to rounded quartz, and 80-85% very-slightly oxidized to highly-oxidized glauconite; a very few shell fragments and foraminifers
- 320-330 "
- 330-340 "

TUSCALOOSA FORMATION (340-420')

- 340-350 Sand - black, very-slightly argillaceous; medium to coarse-grained, well-sorted; 95% fresh- to slightly-oxidized glauconite, and 5% quartz; a very few shell fragments and foraminifers
- 350-360 "
- 360-370 "

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- 370-380 Sand - dark gray; slightly- to moderately argillaceous; fine- to coarse-grained, moderately-sorted; 60-70% glauconite (mostly fresh, but oxidized in part); 30-40% fine-grained, angular to subangular clear quartz; traces of garnet, pyrite, phosphorite; scattered shell fragments, foraminifers, and ostracods
- 380-390 " 70-80% glauconite, 20-30% quartz
- 390-400 Sand - dark gray, slightly- to moderately-argillaceous (gray clay); medium- to coarse-grained, well-sorted; 90-95% glauconite, mostly fresh, and 5-10% quartz; small amount platy brown phosphorite; scattered shell fragments, echinoid spines, and foraminifers
- 400-410 " slightly more shell, including Aquia foraminifers
- 410-420 " "
- PATUXENT FORMATION (420-1020')
- 420-430 Sand - gray, slightly argillaceous; coarse-grained, fairly well-sorted, subangular to subrounded; moderately arkosic (dull white potassic feldspar); small amounts of glauconite and muscovite
- 430-440 Sand - gray, trace of clay; coarse- to very-coarse grained, fairly well-sorted, subangular to subrounded; moderately arkosic; small amounts of blue quartz, glauconite, and muscovite; a few pelecypod shell fragments
- 440-450 "
- 450-460 Sand - gray, clean; coarse- to very-coarse grained, well-sorted (skewed coarse), subrounded; slightly arkosic (white potassic feldspar); scattered grains of glauconite, garnet, tourmaline
- 460-470 "
- 470-480 Sand - gray, very slightly argillaceous; medium- to very-coarse grained, fairly well-sorted, subangular to rounded; slightly arkosic; small amounts of glauconite and garnet; traces of muscovite, tourmaline, and kyanite

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- 480-490 Clay - grays and browns, very sandy; sand is poorly sorted, slightly arkosic, slightly glauconitic; scattered pelecypod shell fragments
- 490-500 "
- 500-510 Sand - gray, very-slightly argillaceous; medium- to coarse-grained, fairly well-sorted, subangular to subrounded; slightly to moderately arkosic; scattered grains of glauconite, muscovite, and garnet; a few shell fragments
- 510-520 "
- 520-530 " coarse- to very-coarse grained
- 530-540 " medium- to very coarse-grained
- 540-550 " "
- 550-560 Sand - gray, slightly to moderately argillaceous; medium- to very coarse-grained, moderately-sorted, subangular to subrounded; slightly to moderately arkosic (gray and white potassic feldspar); small amount of glauconite; trace of muscovite
- 560-570 No sample
- 570-580 Sand - gray, slightly argillaceous, 10-20% very fine gravel (granule gravel); medium- to very coarse -grained, moderately-sorted, subangular to rounded; moderately arkosic; scattered grains of glauconite, garnet, epidote, muscovite
- 580-590 Sand - gray, trace of clay; coarse-grained, well-sorted, subangular to subrounded; moderately arkosic; scattered grains of glauconite, garnet, epidote, muscovite
- 590-600 "
- 600-610 Sand - gray, slightly argillaceous, about 20% granule gravel; coarse- to very coarse-grained, fairly well sorted, subangular to subrounded; moderately arkosic (gray and white potassic feldspar); scattered grains of glauconite, garnet and muscovite
- 610-620 Sand - gray, moderately-argillaceous to argillaceous (dark-gray clay), a few granules; poorly-sorted; moderately arkosic; trace of glauconite

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- 620-630 Sand - gray, moderately-argillaceous to argillaceous (dark-gray clay), a few granules; poorly-sorted; moderately arkosic; trace of glauconite; much of clay is yellow to brown; small amount of carbonaceous material
- 630-640 Sand - gray, slightly argillaceous; fine- to very-coarse-grained, moderately-sorted (skewed coarse), angular to subrounded; slightly to moderately arkosic; small amount of glauconite; traces of muscovite and garnet
- 640-650 "
- 650-660 " moderately argillaceous
- 660-670 " "
- 670-680 " argillaceous
- 680-690 " slightly argillaceous, about 5% granules and very small pebbles
- 690-700 " "
- 700-710 Sand and Gravel - gray, slightly argillaceous; about 30% granules and very fine pebbles; 70% fine- to very coarse grained, poorly-sorted, variably rounded sand; moderately arkosic; traces of garnet and muscovite
- 710-720 " moderately argillaceous
- 720-730 Sand - gray, very argillaceous (dark-gray and greenish clays); fine to coarse-grained, rather poorly-sorted, variably rounded; arkosic; a very few shell fragments; scattered flakes of muscovite
- 730-740 " scattered grains of glauconite
- 740-750 Sand and Gravel - gray, slightly argillaceous; 60% granule gravel (2-4 mm), well-sorted, subrounded; 40% coarse- to very coarse grained sand; moderately arkosic; traces of glauconite, epidote, pyrite, garnet
- 750-760 " 70-80% granule gravel
- 760-770 Sand - gray, slightly argillaceous, 5-10% granule gravel; medium- to very coarse grained, fairly well-sorted, subangular to subrounded; arkosic (abundant potassic feldspar); a few grains of garnet, muscovite, and glauconite
- 770-780 "

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- 780-790 Sand - gray, slightly argillaceous, 5-10% granule gravel; medium- to very coarse grained, fairly well-sorted, subangular to subrounded; arkosic (abundant potassic feldspar); a few grains of garnet, muscovite, and glauconite; 15-20% granules, and a few very-small pebbles
- 790-800 Sand - gray, argillaceous; fine- to very coarse-grained, poorly-sorted arkosic sand with a binder of friable yellowish clay, and zones of sandy, plastic, dark-gray clay containing a few fossils - pelecypods, worm tubes, echinoid spines, and foraminifers; small amounts of glauconite, muscovite, and garnet
- 800-810 "
- 810-820 " a few small pebbles and large pelecypod shell fragments
- 820-830 Sand - brownish gray, moderately argillaceous, a very few very small pebbles and large shell fragments; very-fine to very-coarse grained, poorly-sorted, angular to subrounded; arkosic; small amounts of glauconite, muscovite, and carbonaceous matter; trace of garnet
- 830-840 Sand - brownish-gray, slightly argillaceous; a few granules and very-small pebbles; very-fine to very-coarse grained, poorly sorted, angular to subrounded; moderately arkosic; traces of glauconite, muscovite, pyrite, garnet, epidote, and shell material
- 840-850 "
- 850-860 "
- 860-870 "
- 870-880 "
- 880-890 "
- 890-900 "
- 900-910 Clay - gray, very sandy; sand is very fine to very coarse grained, poorly-sorted, arkosic; traces glauconite, muscovite
- 910-920 "

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- 920-930 Sand - gray, very argillaceous; very fine to coarse-grained, poorly sorted, poorly rounded; arkosic; scattered grains of glauconite and muscovite
- 930-940 Sand - brownish gray, slightly argillaceous; coarse- to very-coarse grained, well-sorted, subrounded; moderately arkosic; trace of garnet
- 940-950 " more poorly-sorted, a few very-small pebbles
- 950-960 Clay - dark gray, very sandy; sand is very fine to coarse-grained, poorly-sorted, poorly-rounded; arkosic; slightly glauconitic; minor muscovite and pyrite; trace of garnet; clay is very carbonaceous and slightly pyritic; a few shell fragments, echinoid spines, foraminifers, and ostracods
- 960-970 "
- 970-980 " less carbonaceous
- 980-990 Sand - buff, trace of clay; medium- to coarse-grained, fairly well-sorted, subangular to subrounded; arkosic; minor glauconite and muscovite; trace of garnet
- 990-1000 " slightly argillaceous
- 1000-1010 Sand - light gray, clean, a few granules; medium- to very coarse-grained, well-sorted, subangular to subrounded; arkosic; small amounts glauconite and garnet
- 1010-1020 "

GEOLOGIC SUMMARY

	<u>Rock Unit</u>	<u>Age</u>
0-20 ¹	Columbia Group	Pleistocene
20-240 ¹	Yorktown Formation	Late Miocene
240-300 ¹	Calvert Formation	Middle Miocene
300-340 ¹	Mattaponi Formation	Paleocene
340-420 ¹	Tuscaloosa Formation	Late Cretaceous
420-1020 ¹	Patuxent Formation	Early Cretaceous

Virginia Division of Mineral Resources
 Robert H. Teifke, Geologist
 February 2, 1968