

VIRGINIA DIVISION OF MINERAL RESOURCES
Box 3667, Charlottesville, VA 22903

INTERVAL SHEET

Page 1 of 2 Well Repository No: W# 163 & 164
Date rec'd: Date Processed: Sample Interval: from: to: 20 620
PROPERTY: Number of samples:
COMPANY: Navy Mine Depot #4 Total Depth: 620
COUNTY: York Oil or Gas: Water: Exploratory: XXXXXXXXXXXXX

Washed and floated Box #1 From-To	From-To	From-To	From-To
-	-	-	220 - 230
75 - 85	460 - 470	210 - 220	230 - 240
120 - 130	470 - 480	240 - 250	240 - 250
-	480 - 490	250 - 260	250 - 260
130 - 140	490 - 500	270 - 280	260 - 270
180 - 190	500 - 510	320 - 330	-
190 - 200	-	-	270 - 280
200 - 210	540 - 545	330 - 340	280 - 290
210 - 220	545 - 550	420 - 430	290 - 300
-	556 -	515 - 520	390 - 400
220 - 230	560 - 570	520 - 530	500 - 510
230 - 240	570 - 580	530 - 540	-
250 - 260	-	-	510 - 520
260 - 270	580 - 590	555 - 560	515 - 520
280 - 290	590 - 595	600 - 610	520 - 530
-	595 - 600	610 - 620	530 - 540
290 - 300	600 - 610	-	540 - 543
300 - 310	610 - 620	Unwashed samples from boxes	540 - 545
310 - 320	-	-	-
340 - 350	Washed and Floated Box #4	30 -	Unwashed samples Box 3
350 - 360	-	50 -	-
-	-	50 - 60	-
360 - 370	20 -	60 - 70	300 - 310
370 - 380	30 -	70 - 80	310 - 320
380 -	40 -	-	340 - 350
380 - 390	50 -	-	300 - 360
390 - 400	50 - 60	80 - 90	-
-	-	90 - 100	-
400 - 410	60 - 70	100 - 110	360 - 370
410 - 420	70 - 80	110 - 120	380 - 390
430 - 440	80 - 90	120 - 130	390 - 400
440 - 450	90 - 100	-	400 - 410
450 - 460	100 - 110	130 - 140	410 - 420
		140 - 150	
		160 - 170	
	110 - 120	180 - 190	
	140 - 150	210 - 220	
	150 - 160		
	160 - 170		
	170 - 180		

VIRGINIA DIVISION OF MINERAL RESOURCES
Box 3667, Charlottesville, VA 22903

INTERVAL SHEET

Page _____ of _____ Well Repository No: _____
Date rec'd: ² _____ Date Processed: ² _____ Sample Interval: from: to: ^{163 & 164}
PROPERTY: _____ Number of samples: ^{20 620}
COMPANY: _____ Total Depth: _____
COUNTY: _____ Oil or Gas: Water: Exploratory: ⁶²⁰
XXXXXXXXXXXX

From-To	From-To	From-To	From-To
-	-	-	-
430 440	-	-	-
440 450	-	-	-
450 460	-	-	-
460 470	-	-	-
470 480	-	-	-
-	-	-	-
480 490	-	-	-
545 550	-	-	-
556 557	-	-	-
555 560	-	-	-
560 570	-	-	-
-	-	-	-
570 580	-	-	-
580 590	-	-	-
590 595	-	-	-
590 600	-	-	-
600 610	-	-	-
-	-	-	-
610 620	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-

Unwashed samples Box #3

OWNER: Naval Mine Depot # 3 & 4
DRILLER:
COUNTY: York Co.

VDMR # 163 & 164
WWCR # ~~120~~ & ~~121~~ 35
Depth: 620'

SAMPLE EXAMINATION
(washed)

	PLEISTOCENE	COLUMBIA GROUP
20-30	Yellow sand and clay	
	MIOCENE	CHESAPEAKE GROUP
30-40	No sample	
40-50	Predominantly shell fragments with yellow-pink sand and clay	
50-80	Clay, tan brown pink, calcareous to non-calcareous, soft to firm, sandy with shell fragments.	
80-90	Predominantly large shell fragments	
90-150	Sand, fine grained, angular, argillaceous, cemented in part with calcareous clay. With shell fragments and abundant foraminifera 130-150.	
150-160	No sample	
160-170	Sand as above	
170-180	No sample	
180-190	Clay, tan, sandy, non calcareous with foraminifera	
190-210	No sample	
210-250	Clay, brown pink, firm, slightly sandy, non calcareous	
250-320	As above with minor yellow clay and abundant gypsum crystals. Foraminifera 290-320'	
320-340	No sample	
340-370	Sand, fine grained, angular. Abundant brown calcareous clay. With shell fragments and foraminifera. Sand grades into sandy clay in part.	

370-380	No sample		
		Eocene	CHICKOHOMINY FM.
380-420	Clay, dark brown, soft, calcareous, sandy with shell fragments and abundant gypsum crystals and foraminifera		
420-430	No sample		
430-450	Clay as above		
450-460	Clay as above interbedded with limestone, glauconitic, hard, dense, sandy, fossiliferous		
		Eocene	NANJEMOY FORMATION (?)
460-480	Clay, brown, pink to tan pink, marly, glauconitic, sandy, firm, glauconitic with shell fragments		
		PALEOCENE-UPPER CRETACEOUS	MATTAPONI FM.
480-490	Clay, pink, yellow and tan, sandy, firm, glauconitic with shell fragments		
490-500	No sample		
500-510	Clay, tan, glauconitic, sandy to gravelly with shell fragments		
510-530	Clay, yellow, pink and red, firm, slightly glauconitic trace of limestone, gray, dense, glauconitic		
530-540	Sandstone, fine grained, pink to tan, poorly cemented with tan calcareous clay, glauconitic with shell fragments and foraminifera		
540-590	Clay, pink buff yellow, firm, slightly sandy, glauconitic with shell fragments interbedded with thin beds of limestone dense, glauconitic, sandy		
590-600	Clay, dark gray, pink, tan, firm, sandy, glauconitic with shell fragments		
600-610	Gravel and sand with abundant limestone and red clay		
610-620	Clay, dark gray, glauconitic, sandy, with gravel and large fragments of limestone		

GEOLOGIC SUMMARY

Pleistocene	Columbia Gp.	Surface-40'
Miocene	Chesapeake Gp.	40-380'
Eocene	Chickahominy Fm.	380-460
Eocene	Nanjemo Fm. (?)	460-480

Paleo-Cret

Mattaponi Fm.

480-T.D.

(tops from W. S. P. 1361)

VIRGINIA DIVISION OF MINERAL RESOURCES
William Dudley
September 1958

Owner: Naval Mine Depot #40 20
Driller: ?
County: York

W# 163 and 164
C# 35
Total depth: 620'
Quad: Yorktown

Depth
(feet)

GEOLOGIC LOG

- 0-20 No sample.
- 20 Sand - white; fine to medium grained, some coarse grains, few granules; subangular to subrounded; moderately well sorted; quartz; feldspar; some opaques; muscovite. (washed samples only)
- 30 Sand - dark yellowish orange; slightly clayey; fine to medium grained; subangular to subrounded; moderately well sorted; quartz; feldspar; 2% opaques; some glauconite; muscovite.
- 40 Sand - off white; fine to coarse grained; subangular to subrounded; moderately sorted; quartz; feldspar; 2% glauconite; few opaques. (washed sample only)
- 50 Shell - hash-dark yellowish orange; slightly clayey; some fine to medium grained quartz sand; shark's tooth.
- 50-60 Shell hash and sand - olive light gray; moderate clay; fine to medium grained, some coarse grains; subangular to subrounded; moderately well sorted; 50% shell fragments; quartz; some glauconite; some black phosphatic material; some spines; forams; (inc. Quinqueloculina); muscovite; ostracode.
- 60-70 Clay - light olive gray; slightly sandy; fine to medium grained; subangular to subrounded; moderately well sorted; quartz; some shell fragments; gypsum 15% of sand sized material; few grains of glauconite; forams rare (inc. Textularia); ostracode.
- 70-78 No sample.
- 78-80 Shell hash-olive light gray; moderate clay; abundant sand; fine grained, some medium grains; subangular to subrounded; well sorted; 70% shell fragments (avg. 4mm); quartz; 2% glauconite; some spines; few black phosphatic fragments; forams (inc. Quinqueloculina); ostracodes.
- 80-90 As above except slightly sandy; 90% shell fragments (avg. 10mm); few spines.
- 90-100 Sand - light olive gray; slightly clayey; fine to medium grained; subangular to subrounded; moderately well sorted; quartz; 10% shell fragments; some black phosphatic material; some glauconite.

-2-

Depth
(feet)

100-110 As above except 2% shell fragments.

110-120 As above except 7% shell fragments; few spines.

120-130 As above.

130-140 As above except 5% shell fragments; forams (inc. Buccella and Nonion).

140-150 As above except forams (inc. Nonion).

150-160 As above (washed sample only).

160-170 Sand - olive light gray; moderate clay; very fine to fine grained; subangular to subrounded; well sorted; quartz; 3% shell fragments; some black phosphatic material; some muscovite; few grains of glauconite; few spines.

170-180 No sample.

180-190 Sand - olive light gray; abundant clay; fine grained; subangular to subrounded; well sorted; quartz; some black phosphatic material; few shell fragments; muscovite; foram.

190-210 No sample.

210-220 Clay - light yellowish gray; some fine to medium grained quartz sand; gypsum 40% of sand sized material; some shell fragments; some black phosphatic fragments.

220-230 As above.

230-240 As above except yellowish gray.

240-250 Clay - light olive gray, light brown; slightly sandy; medium grained; subangular to subrounded; well sorted; quartz; 30% gypsum crystals; some glauconite; few black phosphatic fragments.

250-260 As above except 2% gypsum crystals.

260-270 Clay - olive light gray, light brown; some non-clay material; gypsum; 90% of non clay fraction; some quartz; few grains of glauconite.

270-280 Clay - olive light gray, light brown, moderate yellow; moderate sand; medium grained; subangular to subrounded; well sorted; quartz; 15% gypsum crystals; some glauconite; some black phosphatic material.

280-290 Clay - light olive gray; moderate sand; medium to coarse grained; subangular to subrounded; moderately well sorted; quartz; some black phosphatic material; some glauconite; few gypsum crystals; forams common (inc. Robulus, Uvigerina, and Nonion).

-3-

Depth
(feet)

- 290-300 As above except slightly sandy; forams abundant (inc. Uvigerina, Robulus, Nonion, Textularia, Bulimina, and Dentalina).
- 300-310 Clay - yellowish gray; slightly sandy; fine to medium grained; subangular to subrounded; moderately well sorted; quartz; gypsum plates 25% of sand sized fraction; forams 10% of sand sized fraction; forams 10% of sand sized fraction (inc. Nonion, Robulus, Uvigerina, Bulimina, and Buccella); some black phosphatic material; some glauconite.
- 310-320 Clay - olive light gray; some non-clay material; gypsum plates 70% of non-clay fraction; some black phosphatic material; some bone fragments; forams abundant (inc. Robulus, Uvigerina, Nonion, Globulina, and Marginulina).
- 320-330 No sample.
- 340-350 Sand - olive light gray; slightly clayey; medium grained, some coarse grains; subangular to subrounded; well sorted; quartz; 3% black phosphatic material; some glauconite; some shell fragments; few bone fragments.
- 350-360 As above plus forams common (inc. Nonion, Siphogenerina, Bulimina, Uvigerina, and Textularia).
- 360-370 As above except forams (inc. Siphogenerina, Nonion, and Buccella).
- 370-380 No sample.
- 380-390 Clay - olive light gray; moderate sand; fine to medium grained; subrounded to rounded; moderately well sorted; glauconite 50% of sand sized fraction; quartz; forams abundant (inc. Nodosaria, Siphogenerina, Robulus, Dentalina, Nonion, and Guttulina); some shell fragments; some spines; few bone fragments; few limestone fragments.
- 390-400 Clay - olive light gray; moderate sand; fine to coarse grained; subangular to rounded; moderately sorted; quartz; glauconite 20% of sand sized fraction (inc. Nodosaria, Robulus, Siphogenerina, Buccella, Guttulina, Dentalina, Globigerina, Globulina, and Discorbis); some shell fragments; few black phosphatic fragments; few bone fragments; ostracode.
- 400-410 Clay - olive light gray; slightly sandy; fine to coarse grained; subangular to subrounded; moderately sorted; quartz; forams 7% of sand sized fraction (inc. Nodosaria, Siphogenerina, Robulus, Uvigerina, Globulina, Pyrulina, Buccella, Dentalina, and Globigerina); glauconite 7% of sand sized fraction; some shell fragments; few black phosphatic fragments.

Depth
(feet)

- 410-420 As above except forams abundant (inc. Nodosaria, Robulus, Globulina, Guttulina, Uvigerina, and Buccella); few gypsum crystals.
- 420-430 No sample.
- 430-440 Clay - olive light gray, medium light gray (clasts); moderate sand; fine grained; rounded; well sorted; glauconite 50% of sand sized fraction (green, black); quartz; forams 5% of sand sized fraction (inc. Robulus, Nodosaria, Siphogenerina, Buccella, and Guttulina); 5% shell fragments; few spines.
- 440-450 As above except 40% glauconite; forams abundant (inc. Robulus, Nodosaria, Siphogenerina, and Dentalina); few gypsum crystals.
- 450-460 Limestone and clay - olive light gray; slightly sandy; fine to coarse grained; rounded; moderately sorted; 60% very large limestone fragments (1-25mm); glauconite 40% of sand sized fraction; quartz; 15% shell fragments; 5% forams (inc. Siphogenerina, Nodosaria, Robulus, Buccella, and Dentalina); muscovite.
- 460-470 Sand - light olive gray; abundant clay; medium to very coarse grained, 5% granules, few pebbles; subrounded to rounded; poorly sorted; quartz; 35% glauconite (black, green); 3% shell fragments; few limestone fragments; forams (inc. Robulus and Nodosaria).
- 470-480 Sand - light olive brown; moderate clay; medium to coarse grained; subrounded to rounded; moderately well sorted; quartz; 20% glauconite; 10% shell fragments; some feldspar; few grains of garnet; forams scarce (inc. Robulus).
- 480-490 As above except abundant clay; forams (inc. Robulus, Nodosaria, and Buccella); no garnet.
- 490-500 No sample.
- 500-510 Sand - light olive gray; slightly clayey; medium to coarse grained; subrounded to rounded; moderately well sorted; quartz; 25% glauconite; (black, green, brown); 15% limestone and shell fragments; some feldspar; few grains of garnet.
- 510-520 Clay and sand - dark yellowish orange; abundant clay; moderate sand; fine grained; subangular to subrounded; well sorted; quartz; some sandy (glauconite) limestone fragments; some glauconite; some muscovite; feldspar; few flakes of biotite.
- 520-530 Clay - yellowish gray, dark yellowish orange; abundant sand; medium to coarse grained; moderately well sorted; quartz; 30% glauconite; some sandy limestone and shell fragments; feldspar; muscovite.

-5-

Depth
(feet)

- 530-540 Sand - yellowish gray; moderate clay - yellowish gray, dark yellowish orange; fine to medium grained, some coarse grains; subangular to subrounded; moderately sorted; quartz; 5% glauconite; feldspar; some muscovite; few limestone fragments.
- 540-545 Sand - light olive gray; moderate clay; medium to coarse grained, few granules; subrounded to rounded; moderately sorted; quartz; 35% glauconite; 7% limestone and shell fragments; feldspar; muscovite.
- 545-550 Sand - yellowish gray; abundant clay; fine to coarse grained; subangular to rounded; moderately sorted; quartz; 20% glauconite; 15% limestone fragments (1-20mm); feldspar; some shell fragments; few grains of garnet; muscovite.
- 550-555 No sample.
- 555-560 Sand - olive light gray; moderate clay - olive light gray, light reddish orange; medium to coarse grained, some fine grains; subangular to rounded; moderately sorted; quartz; 35% glauconite; some limestone fragments; some shell fragments; feldspar; forams rare (inc. Quinqueloculina).
- 560-570 As above except 20% glauconite; 20% limestone fragments (0.5-20mm); no foram.
- 570-580 Sand - light olive gray; abundant clay - light olive gray, dark yellowish orange; medium to very coarse grained, some fine grains, 5% granules, some pebbles; subangular to rounded; poorly sorted; quartz; 25% glauconite; 7% sandy (glauconite, quartz) limestone and shell fragments; feldspar.
- 580-590 As above except 10% granules.
- 590-600 Clay - medium gray, dark yellowish orange; abundant sand; medium to very coarse grained; 10% granules, 5% pebbles; subangular to rounded; poorly sorted; quartz; 15% glauconite; feldspar; 10% sandy (glauconite, quartz) limestone and shell fragments; muscovite.
- 600-610 Sand - yellowish gray; slightly clayey - light brown, moderate reddish orange (clasts); fine to very coarse grained, some granules, some pebbles; subangular to subrounded; poorly sorted; quartz; 25% limestone fragments (1-15mm); 5% glauconite; feldspar; some muscovite; few shell fragments.
- 610-620 Sand - light olive gray; moderate clay - medium gray, yellowish gray, moderate reddish orange (clasts); medium to coarse grained, some fine grains, some granules, few pebbles; subangular to rounded; poorly sorted; quartz; 15% limestone fragments (4-20mm); 10% glauconite; some feldspar; muscovite; some shell fragments; foram.

Logged by: Michael T. Currie

VDMR Well No. 163 and 164 Combined (?)
(See footnote on log)

York Co.

Prop: Naval Mine Depot

<u>Interval</u>	<u>Description</u>	
20-30	FLEISTOCENE yellow sand and clay	COLUMBIA GROUP
	MIocene	CHESAPEAKE GROUP
30-40	no sample	
40-50	predominantly shell fragments with yellow-pink sand and clay	
50-80	clay, tan brown pink, calcareous to non-calcerous, soft to firm, sandy with shell fragments	
80-90	predominantly large shell fragments	
90-150	sand, fine grained, angular, argillaceous, cemented in part with calcareous clay/ With shell fragments and abundant foraminifera 130-150.	
150-160	no sample	
160-170	sand as above	
170-180	no sample	
180-190	clay, tan, sandy, non calcareous with foraminifera	
190-210	no sample	
210-250	clay, brown pink, firm, slightly sandy, non calcareous	
250-320	as above with minor yellow clay and abundant gypsum crystals. Foraminifera 290-320'	
320-340	no sample	
340-370	sand, fine grained, angular. Abundant brown calcareous clay. With shell fragments and foraminifera. Sand grades into sandy clay in part.	
370-380	no sample	
	Eocene	CHICKOHOMINY FM.
380-420	clay, dark brown, soft, calcareous, sandy with shell fragments and abundant gypsum crystals and foraminifera	
420-430	no sample	

Wells Nos. 163 & 164 (cont'd)

430-450	clay as above	
450-460	clay as above interbedded with limestone, glauconitic, hard. dense, sandy, fossiliferous	
	EOCENE	NANJEMOY FORMATION (?)
460-480	clay, brown, pink to tan pink, marly, glauconitic, sandy, firm, glauconitic with shell fragments	
	PALEOCENE-UPPER CRETACEOUS	MATTAPONI FM.
480-490	clay, pink, yellow and tan, sandy, firm, glauconitic with shell fragments	
490-500	no sample	
500-510	clay, tan, glauconitic, sandy to gravelly with shell fragments	
510-530	clay, yellow, pink and red, firm, slightly glauconitic trace of limestone gray, dense, glauconitic	
530-540	sandstone, fine grained, pink to tan, poorly cemented with tan calcareous clay, glauconitic with shell fragments and foraminifera	
540-590	clay, pink buff yellow, firm, slightly sandy, glauconitic with shell fragments interbedded with thin beds of limestone dense, glauconitic, sandy	
590-600	clay, dark gray, pink, tan, firm, sandy, glauconitic with shell fragments	
600-610	gravel and sand with abundant limestone and red clay	
610-620	clay, dark gray, glauconitic, sandy with gravel and large fragments of limestone	

SUMMARY

Pleistocene	Columbia Gp.	Surface - 40'
Miocene	Chesapeake Gp.	40 - 380'
Eocene	Chickahominy Fm.	380 - 460
Eocene	Nanjemoy Fm. (?)	460 - 480
Paleo-Cret	Mattaponi Fm.	480 - T.D.

(tops from W.S. P. 1361)