

COMMONWEALTH OF VIRGINIA
DEPARTMENT OF CONSERVATION AND ECONOMIC DEVELOPMENT

MAILING ADDRESS:

DIVISION OF MINERAL RESOURCES

OFFICE ADDRESS:

B-3667
Charlottesville, VA 22903

JAMES L. CALVER, COMMISSIONER

McCormick Road
Charlottesville, Virginia

WATER WELL COMPLETION REPORT

OWNER: State Water Control Board Well Mailing Address: 11 South 10th Street, Richmond, VA
23219

TENANT: Bureau of Water Control Management #1 Mailing Address: _____

DRILLER: Singer-Layne Atlantic Company Mailing Address: Norfolk, Va.

WELL LOCATION: County Charles City Approx. 2,725 feet miles East (direction) of _____
State Route 618 and 50 feet miles South (direction) of State Rte. 5

(GIVE DIRECTION AND DISTANCE IN FEET OR MILES FROM TWO REFERENCE POINTS - ROADS, TOWNS, RIVERS, ETC. - ON COUNTY HIGHWAY OR OTHER MAP.)

DATE STARTED: November 7, 1972 DATE COMPLETED: February 21, 1973

TYPE OF DRILL RIG USED: Rotary TOTAL DEPTH 591 feet

WATER LEVEL: Stands _____ feet below surface OR
has NATURAL flow of _____ gallons per minute.

YIELD TEST: Method _____
Drawdown _____ feet
Rate _____ gal. per min.
Duration _____ hrs., _____ min.

HOLE SIZE: 20 inches from 0 to 23 feet
15 1/2 inches from 23 to 550 feet
? inches from 550 to 591 feet

WATER ZONES: from _____ to _____ feet
from _____ to _____ feet
from _____ to _____ feet

SCREEN SIZE: _____ inches from _____ to _____ feet
Pulled _____ inches from _____ to _____ feet
_____ inches from _____ to _____ feet

WATER: Color _____ Taste _____
Odor _____ Temp. _____ °F

CASE SIZE: _____ inches from _____ to _____ feet
Pulled _____ inches from _____ to _____ feet
_____ inches from _____ to _____ feet

WELL TO SUPPLY: (check one) Home _____
Farm _____ Town _____ School _____
Industry _____ Other exploratory

GROUTING: Method _____
Material _____ Depth _____ feet

WATER ANALYSIS AVAILABLE: Yes _____ No X

PUMP: Type _____ Capacity _____ gal. per min.
Depth of intake _____ feet

DRILL CUTTINGS SAVED: 63 Yes X No _____

(DRILL CUTTINGS SHOULD BE COLLECTED AT 10 FOOT INTERVALS. THESE SAMPLES MAY BE SHIPPED TO THIS OFFICE EXPRESS COLLECT. SAMPLE BAGS ARE FURNISHED FREE OF CHARGE UPON REQUEST.)

REMARKS: Hole abandoned - Samples delivered to D. M. R.

BWCM Chas. City TH #1

*Advised by H. M. Townsend 1/16/73 that 222-588' samples are poor (returned to HMT). As TH #2 will be 10' away from # 1, samples from 550-588' in this well will be processed with samples from 0-550' in TH #2 (which is only 552' deep).

LOG

FURNISHED BY: _____

DATE: _____

DEPTH (feet)		TYPE OF ROCK OR SOIL PENETRATED (gravel, clay, etc., hardness, color, etc.)	REMARKS (water, caving, shot, screen, sample, etc.)
FROM	TO		
0	10	Fine Sand	
10	20	Coarse sand with clay	
20	70	Shells	
70	105	Black clay	
105	140	Multi-colored clay	
140	173	Soft blue clay	
173	175	Hard Silt, shells and clay	
175	205	White and black clay, medium sand	
205	235	Multi-colored clay, coarse sand, shells	
235	380	White sandy clay, sticky clay, coarse sand	
380	390	Sticky clay, coarse sand	
390	550	Coarse and fine sand, clay	Info. from Table # 1
550	575	Fine gravel with clay streaks	
575	580	Gray clay	
580	591	Hard rock	
Geologic Data			
Electric Log Tops			
<u>Formation</u>	<u>Depths (Ft.)</u>	<u>Total</u>	<u>Thickness (Ft.)</u> Sand Clay
Paleocene	74 - 202	128	11 117
Cretaceous	202 - 581	379	62 317
Pre-Cretaceous Rock	581		
CASING RECORD			
1.	10.33		
	20.00	Screen No. 4 (14' effective screen)	
2.	14.40		
	10.00	Screen No. 3 (7' effective screen)	
3.	20.50		
4.	20.83		
5.	20.71		
	20.00	Screen No. 2 (14' effective screen)	
6.	28.40		
7.	21.00		
8.	20.80		
9.	20.72		
	20.00	Screen No. 1 (14' effective screen)	
10.	21.22		
11.	20.93		

(Use additional forms if necessary)

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JAMES L. CALVER, COMMISSIONER

McCormick Road
Charlottesville, Virginia

WATER WELL COMPLETION REPORT

OWNER: State Water Control Board Mailing Address: 11 South 10 St., Richmond, VA 23219

TENANT: Bureau of Water Control Management #2 Mailing Address: _____

DRILLERS: Singer - Layne Atlantic Co. Mailing Address: Norfolk, VA.

WELL LOCATION: County Charles City Approx. 2725 ^{feet} miles East of St. Rte. 618 (direction) of _____ and 50 ^{feet} miles south (direction) of State Rte. 5

(GIVE DIRECTION AND DISTANCE IN FEET OR MILES FROM TWO REFERENCE POINTS - ROADS, TOWNS, RIVERS, ETC. - ON COUNTY HIGHWAY OR OTHER MAP.)
Elev. 35'

DATE STARTED: February 24, 1973 DATE COMPLETED: March 31, 1973

TYPE OF DRILL RIG USED: Rotary TOTAL DEPTH 552 feet

WATER LEVEL: Stands 52 feet below surface OR
has NATURAL flow of _____ gallons per minute.

YIELD TEST: Method Submersible Pump
Drawdown 40 feet
Rate 200 gal. per min.
Duration 10 hrs., _____ min.

HOLE SIZE: 20 inches from 0 to 20 feet
18 inches from 20 to 552 feet
_____ inches from _____ to _____ feet

WATER ZONES: from 290 to 310 feet
from 403 to 420 feet
from 484 to 496 feet
510 526

SCREEN SIZE: 6 inches from 290 to 310 feet
6 inches from 404 to 424 feet
6 inches from 486 to 496 feet
6 inches from 510 to 530 feet
18" from +2 to 20 feet
CASE SIZE: 6 inches from 0 to 290 feet
310 404
_____ inches from 424 to 486 feet
496 510
_____ inches from 530 to 552 feet

WATER: Color clear Taste excellent
Odor none Temp. 59 °F

GROUTING: Method Poured
Material concrete Depth 30 feet

WELL TO SUPPLY: (check one) Home _____
Farm _____ Town _____ School _____
Industry _____ Other Observation well

PUMP: Type _____
Capacity _____ gal per min
Depth of intake _____ feet

WATER ANALYSIS AVAILABLE: Yes No _____

DRILL CUTTINGS SAVED: * Yes No _____

(DRILL CUTTINGS SHOULD BE COLLECTED AT 10 FOOT INTERVALS. THESE SAMPLES MAY BE SHIPPED TO THIS OFFICE EXPRESS COLLECT. SAMPLE BAGS ARE FURNISHED FREE OF CHARGE UPON REQUEST.)

REMARKS: Gravel packed from 552' to 30'. Clay seals placed as follows: 390'-400'; 475'-485';
500'-510'. * This form prepared by BWCM. Samples (550-588), (585-590) from well #1 combined with
samples (0-550') from this well. See note on form for Well #1 (C-112).

COMMONWEALTH OF VIRGINIA

LOG

FURNISHED BY: _____

DATE: _____

DEPTH (feet)		TYPE OF ROCK OR SOIL PENETRATED (gravel, clay, etc., hardness, color, etc.)	REMARKS (water, caving, shot, screen, sample, etc.)
FROM	TO		
		See drillers log for Well #1 (W-3876, C-112)	

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

INTERVAL SHEET

C-112 and 113*

Page _____ of _____ Well Repository No.: W-3876
 Date rec'd 6/5/73 Date Processed: 5/13/74 Sample Interval: from 0 to: 590*
 PROPERTY: State Water Control Board (Water Control Mgmt.*) Number of samples: 64*
 COMPANY: Layne Atlantic Company Total Depth: 591*
 COUNTY: Charles City (Charles City) Oil or Gas: Water: Exploratory

From-To	From-To	From-To	From-To
0 - 10	250 - 60	500 - 10	-
10 - 20	260 - 70	510 - 20	-
20 - 30	270 - 80	520 - 30	-
30 - 40	280 - 90	530 - 40	-
40 - 50	290 - 300	540 - 50	-
-	-	-	-
50 - 60	300 - 10	550 - 60	-
60 - 70	310 - 20	560 - 70	-
70 - 80	320 - 30	570 - 80	-
80 - 90	330 - 40	580 - 88	-
90 - 100	340 - 50	-	-
-	-	-	-
100 - 10	350 - 60	585 - 86	-
110 - 20	360 - 70	586 - 87	-
120 - 30	370 - 80	587 - 88	-
130 - 40	380 - 90	588 - 89	-
140 - 50	390 - 400	589 - 90	-
-	-	-	-
150 - 60	400 - 10	-	-
160 - 70	410 - 20	-	-
170 - 80	420 - 30	-	-
180 - 90	430 - 40	-	-
190 - 200	440 - 50	-	-
-	-	-	-
200 - 10	450 - 60	-	-
210 - 20	460 - 70	-	-
220 - 30	470 - 80	-	-
230 - 40	480 - 90	-	-
240 - 50	490 - 500	-	-

Core Chips

Hand specimen representative of 585' to 595'
 see R-7323

* Samples for 0-550' collected from well # 2, samples and core for 550-590 collected from Well #1 (10' from well #2)
 0-588' washed, and unwashed, 585-590', core unwashed

Owner - State Water Control Board
(Water Control Management)
Driller - Layne Atlantic Co.
County - Charles City (Charles City)

W#:3876
C#:112 & 113
Total Depth 591'

Depth (feet)

GEOLOGIC LOG

NORFOLK FORMATION (0-20')

- 0-10 Sand - dark yellowish orange; moderate staining; slightly clayey; medium grained with some coarse grains; subangular to subrounded; well sorted; quartz; feldspar; some opaques.
- 10-20 Sand and clay - medium gray, dark yellowish orange; slightly stained; moderate clay; abundant sand; fine to medium grained; subangular to subrounded; moderately well sorted; quartz; feldspar; opaques; few grains of glauconite; muscovite.

YORKTOWN FORMATION (20-60')

- 20-30 Sand - white; slightly clayey; medium grained; subangular to subrounded; well sorted; quartz; some feldspar; few opaques; few grains of glauconite.
- 30-40 As above.
- 40-50 As above except fine to medium grained; moderately well sorted.
- 50-60 Sand - yellowish gray; slightly clayey; medium grained, subangular to rounded; moderately well sorted; quartz; 10% glauconite (black, green); forams common (inc. Buccella, Bolivina, Textularia, Guttulina and Discorbis); ostracodes common; spines.

CALVERT FORMATION (60-80')

- 60-70 Shell hash-light olive gray; slightly clayey; abundant sand; medium grained; subangular to rounded; moderately well sorted; quartz; 15% glauconite; ostracodes abundant; forams (inc. Buccella, Guttulins, Bolivina, and Robulus); spines.
- 70-80 As above except no Robulus.

NANJEMOY FORMATION (80-120')

- 80-90 Sand - salt and pepper; slightly clayey; medium grained to granular; subangular to rounded; moderately sorted; 50% glauconite; 30% quartz; 20% shell fragments; 2% limestone fragments; pyrite.

Depth (feet)

- 90-100 Limestone and sand-olive gray; abundant clay; medium grained to granular; subrounded to rounded; moderately sorted; 70% limestone and shell fragments; quartz; glauconite 50% of sand sized fraction; pyrite; forams rare (inc. Buccella).
- 100-110 Clay - olive light gray; abundant sand; medium grained to granular; subrounded to rounded; moderately sorted; quartz; 25% glauconite; 25% limestone and shell fragments; pyrite; forams (inc. Buccella and Robulus).

MATTAPONI FORMATION (120-180')

- 120-130 Sand - moderate olive brown; moderate clay-gray, orange; fine grained to granular; subangular to rounded; poorly sorted; 50% glauconite; quartz; 7% limestone and shell fragments; pyrite; forams (inc. Nodosaria, Robulus, and Dentalina).
- 130-140 Sand - olive gray; abundant clay-gray, orange; medium grained with some fine grains, some granules; rounded; moderately well sorted; 60% glauconite; quartz; some limestone and shell fragments; forams (inc. Nodosaria, Robulus, and Marginulina); pyrite.
- 140-150 Sand - olive gray; abundant clay; medium grained, rounded; well sorted; 80% glauconite; quartz; some limestone and shell fragments; forams rare (inc. Nodosaria); pyrite.
- 150-160 As above except moderate clay; 70% glauconite; no pyrite.
- 160-170 As above except no Nodosaria.
- 170-180 Gravel and sand - salt and pepper; slightly clayey; medium grained to gravel; subrounded to rounded; poorly sorted; quartz; glauconite 80% of sand fraction; 15% shell fragments; forams (inc. Nodosaria, Dentalina, Robulus, and Buccella) pyrite; few grains of garnet.

Depth (feet)

PATUXENT FORMATION (180-585')

- 180-190 Sand - salt and pepper; slightly clayey; medium to very coarse grained, some granules, some pebbles; subrounded to rounded; poorly sorted; quartz; 15% glauconite; feldspar; 3% shell fragments; pyrite.
- 190-200 Sand - white, slightly clayey; very coarse grained to granular; subrounded; moderately well sorted; quartz; feldspar; 5% glauconite.
- 200-210 As above except 2% glauconite; pyrite; Robulus.
- 210-220 Sand - white; moderate clay; medium grained to granular (40%); subangular to rounded; poorly sorted; quartz; 10% glauconite; some limestone and shell fragments.
- 220-230 As above except slightly clayey; 30% granules; 20% glauconite; garnet.
- 230-240 Sand - moderate yellowish brown; abundant clay-orange, gray; medium to very coarse grained, some granules; subangular to rounded; poorly sorted; quartz; 25% limestone and shell fragments; 15% glauconite; feldspar.
- 240-250 Sand - white; moderate clay; medium to very coarse grained, some granules, some pebbles; subangular to rounded; moderately sorted; quartz; 10% glauconite; few limestones and shell fragments.
- 250-260 Sand - white; moderate clay; coarse to very coarse grained, some granules; subrounded to rounded; moderately well sorted; quartz; feldspar; 15% glauconite; few shell fragments; forams rare (inc. Robulus).
- 260-270 Sand - white; slightly clayey; coarse grained to granular (15%), few pebbles; subrounded; moderately well sorted; quartz; feldspar, 5% glauconite; few shell fragments.
- 270-280 As above.
- 280-290 As above except 30% granules; 3% glauconite.
- 290-300 As above except 20% granules.
- 300-310 Sand - white; very slightly clayey; coarse grained to granular (20%), few pebbles; subrounded; moderately well sorted; quartz; feldspar; 5% glauconite.
- 310-320 Sand - white; slightly clayey; very coarse grained to granular (35%), some pebbles; subrounded; moderately well sorted; quartz; feldspar; some glauconite.
- 320-330 Sand - white; slightly clayey; very coarse grained to granular (45%), 2% pebbles; subrounded; moderately well sorted; quartz; feldspar; some glauconite; pyrite.

Depth (feet)

-4-

W# 3876

- 330-340 Sand - white; slightly clayey; coarse to very coarse grained, 15% granules, few pebbles; subrounded; moderately well sorted; quartz; feldspar; 5% glauconite; pyrite.
- 340-350 Sand - white; slightly clayey; coarse to very coarse grained, 10% granules, few pebbles; subrounded; moderately well sorted; quartz; feldspar; 3% glauconite; garnet; pyrite.
- 350-360 Sand - white; slightly clayey; coarse to very coarse grained, 10% granules, few pebbles; subrounded; moderately well sorted; quartz; feldspar; 3% glauconite; garnet, pyrite.
- 360-370 Sand - white; slightly clayey; coarse to very coarse grained, some granules; subrounded; well sorted; quartz; feldspar; 3% glauconite; garnet.
- 370-380 As above except coarse grained to granular.
- 380-390 Sand - light olive brown; moderate clay; coarse to very coarse grained; some granules; subrounded; moderately well sorted; quartz; feldspar; 2% glauconite.
- 390-400 As above except some glauconite; garnet; pyrite.
- 400-410 Sand - white; slightly clayey; coarse to very coarse grained, some granules, few pebbles; subrounded; moderately well sorted; quartz; feldspar, 3% glauconite.
- 410-420 Sand - white; slightly clayey; very coarse grained to granular, 5% pebbles; subrounded; moderately well sorted; quartz; feldspar; few grains of glauconite; garnet; pyrite.
- 420-430 As above except 7% pebbles; no pyrite.
- 430-440 As above except 20% pebbles.
- 440-450 Sand - salt and pepper; some iron staining; slightly clayey; medium to very coarse grained, some granules; subrounded to rounded; moderately sorted; quartz; feldspar; 15% glauconite; some garnet; pyrite.
- 450-460 Sand - white; coarse grained to granular; subrounded; moderately well sorted; quartz; feldspar; some glauconite.
- 460-470 As above except slightly clayey; garnet.
- 470-480 Sand - white; medium grained to granular; subrounded; moderately sorted; quartz; feldspar; some glauconite.
- 480-490 As above.
- 490-500 As above except coarse grained to granular.

Depth (feet)

- 500-510 Sand - white; coarse grained to granular with some medium grains, 15% granules, few pebbles; subangular to subrounded; moderately sorted; quartz; some glauconite.
- 510-520 As above except slightly clayey; 25% granules; few grains of glauconite.
- 520-530 As above except coarse grained to granular; 35% granules; garnet.
- 530-540 As above.
- 540-550 Sand - white; slightly clayey; granular with some medium and some coarse grains; subrounded; moderately sorted; quartz; feldspar; garnet; few fragments of bluish gray, subrounded coarse grained biotite gneissoid rock; glauconite.
- 550-560 As above.
- 560-570 Sand - white; slightly clayey; very coarse grained to granular, with some medium and some coarse grains; subrounded; moderately sorted; quartz; feldspar; few bluish gray, subrounded, coarse grained, biotite gneissoid rock fragments; glauconite.
- 570-580 As above except coarse grained to granular with some medium grains; 2% gneissoid rock fragments; some glauconite.
- 580-588 As above plus 5% gneissoid rock fragments - greenish gray and bluish gray; pyrite.

Logged by: Michael T. Carrie

BASEMENT (585 - 590)

- 585-586 Amphibolite core chips
- 586-587 As above.
- 587-588 As above.
- 588-589 As above.
- 589-590 As above.
- 590-591 No Sample

GEOLOGIC SUMMARY

Thickness (feet)	<u>Rock Unit</u>	<u>Time Rock Unit</u>
20	Norfolk Formation	Pleistocene
40	Yorktown Formation	Pliocene - Miocene
20	Calvert Formation	Miocene - Eocene
40	Nanjemoy Formation	Eocene
60	Mattaponi Formation	Eocene - Cretaceous
405	Patuxent Formation	Cretaceous
5+	Basement Amphibolite	Paleozoic ?

VIRGINIA DIVISION OF MINERAL RESOURCES
David A. Hubbard, Jr., Geologist
July 28, 1978