TOWN COUNCIL
Work Session
Cape Charles Civic Center
February 11, 2016
6:00 p.m.

At approximately 6:00 p.m., Mayor George Proto, having established a quorum, called to order the Town Council Work Session. In addition to Mayor Proto, present were Vice Mayor Bannon, Councilmen Brown, Godwin and Wendell, and Councilwoman Natali. Councilman Bennett arrived at 6:06 p.m. Also in attendance were Town Manager Brent Manuel, Public Works/Utilities Director Dave Fauber and Town Clerk Libby Hume. There was one member of the public in attendance.

A. *VDOT Route 642 Project:*
Brent Manuel gave an overview of VDOT's Route 642 Project and pointed out the affected areas on plans provided by VDOT (Please see attached). VDOT was required to publish the project by March 8th. If the project was not published by that date, the project engineer indicated that more funds would have to be requested from the state. Brent Manuel explained the four components which needed to be approved prior to the March 8th deadline as follows:

1. Right-of-Entry Agreement – The Town currently had an easement across Virginia Port Authority property. The right-of-entry would grant to VDOT, its employees, agents, contractors or assigns the right to enter upon portions of the land encumbered by the Town's drainage easement. An agreement was drafted and this item would be on the February 18, 2016 regular meeting agenda for a vote.

2. Old Cape Charles Road Quitclaim – This was necessary to clean up the title to the existing Old Cape Charles Road. When the Scott family initially established the layout and constructed the road, it was not transferred correctly. The Town would be quitclaiming its interest, if any, in the existing right-of-way based on the Town's status as abutting landowner (Tax Parcel 83-A3-14). This would not reduce the size of Parcel 14. A quitclaim was being requested from each owner of property abutting Old Cape Charles Road. This item required a public hearing be held prior to conveyance.

3. Fee Simple Conveyance – 1.19 acres along the southern boundary of Tax Parcels 83-A3-14 and 83-A3-17 would be conveyed to VDOT for their right-of-way by Fee Simple Special Warranty Deed. South Port would also have to consent to the conveyance since they currently leased these parcels from the Town. VDOT would contact South Port directly. This item also required a public hearing be held prior to conveyance.

4. Perpetual Utility Easements – VDOT was requesting a perpetual utility easement of .04 acres, but acknowledged that the Town could not grant easements longer than 40 years, per Code of Virginia § 15.2-2100. An alternate solution would be for VDOT to submit an offer of compensation for perpetual easements. The Town would reject the offer because it cannot grant perpetual easements. VDOT would take title to the easements by eminent domain through the Certificate of Take procedure. VDOT and the Town would litigate the issue and VDOT would ask the Town to donate the property, which was currently appraised at $130. The internal procedure was unclear but legal counsel thought that the Town Manager could reject the offer because the Town lacked the authority to accept it.

A public hearing followed by a special meeting would be held on Monday, February 22, 2016, at 9:00 a.m. in the Town Hall, due to Councilman Bennett's work/travel schedule.

B. *Water and Wastewater Update:*
Dave Fauber presented an overview of water and wastewater issues. (Please see attached presentation).

There was much discussion regarding the following:

Water: i) Dave Fauber's recommendation to bring the Keck Wells online at a cost of approximately $500K, testing and treating the water, etc. Currently, staff tested quarterly for trihalomethanes (TTHMs) which was a byproduct from chlorination of the drinking water. Staff did not currently test for bromides; ii) The preliminary engineering report recommended chloramines as an alternative disinfectant and the possible addition of ammonia into the water about 10-20 minutes after chlorine application could help with the TTHM issue and would take a capital investment of $33K and about $7K annually for chemicals. Dave Fauber added that residents with fish tanks could not use tap water if ammonia were to be added. There was much discussion regarding $500K to bring the Keck Wells online vs. $33K plus $7K annually for the chloramine system; iii) Additional auto flush systems would also help the water quality.

Wastewater: i) The graph showing the wastewater nutrients showed a number of months over the last three years where the Town exceeded the DEQ limits for nitrogen and phosphorus. Fines were assessed at a rate of $4,360 for each .1 mg/l of nitrogen over the annual average limit of 4 mg/1 and $24,140 for each .1/mg/l of phosphorus over the annual average limit of .3 mg/l. The Town paid fines for 2013 ($45,866) and 2014 ($4,828) and was anticipating an assessment of about $65K for 2015 as well. Dave Fauber cited numerous mechanical failures as the reasons for exceeding the average limits and added that a technician would be coming to diagnose the issue(s) next week; ii) The length of time taken to bring the numbers back in line was discussed at length. Dave Fauber noted that the samples had to be taken to Virginia Beach for testing and it took about one to two weeks to get the results. When the numbers were out of compliance for two, five and seven months at a time the annual average could not be brought back into compliance. It was noted that much of the delay was due to outsourcing of the testing; iii) The possibility of accepting sewage from other businesses to increase revenue. Currently septic tank pumpers had to go to Pocomoke, MD to dump their waste. Businesses dealing with porta-johns had to go to Berlin, MD.

Council requested the following from Dave Fauber.
Water: i) Compilation of quarterly reports for the monitoring wells; ii) Scheduling of a separate meeting with Mayor Proto, Councilman Bennett and any other Council members interested in attending, to work through the testing measures, water quality and the next step regarding the Keck Wells and timeframe for connection; iii) Possibly having a complete test performed now and annually in the future; iv) Determination of whether funds from the connection fee reserve account could be used to connect the Keck Wells.

Wastewater: i) Development of a plan, including testing frequency, to ensure that the plant remained in compliance in the future; ii) Researching the availability of an association for wastewater treatment operators and possibly signing up for a list-serve to enlist the help of other operators since Cape Charles was probably not the only locality to have these issues; iii) Council needed to be notified of all future mechanical failures; iv) Council needed to be notified of any future fines; v) When test results showed the plant exceeding limits, action needed to be taken immediately to ensure that the numbers got back into compliance as soon as possible.

Motion made by Councilman Brown, seconded by Councilwoman Natali, to adjourn the Town Council Work Session. The motion was approved by unanimous vote.

_____
Mayor Proto

_____
Town Clerk

RIGHT OF WAY PLAN SHEET SHOWING PROPERTY FOR COMMONWEALTH OF VIRGINIA

Town Of Cape Charles
Northampton County, Virginia
Scale 1" = 50'
Surveyed By Danny R. Williams, L.S., CFM
January 15, 2014

REVISED	STATE	STATE ROUTE	STATE PROJECT	SHEET NO.
	VA.	642	0642-065-577, RW-201, C-501	4(1)RW

COMMONWEALTH OF VIRGINIA
DANNY ROY WILLIAMS
Lic. No. 2652
LAND SURVEYOR

Danny R Williams
2015.10.27 11:01:48 -04'00'
VDOT Location and Design
Suffolk, Virginia
LAND SURVEYOR

NAD 83 (VSRS 2011)

(015) NORTHAMPTON COUNTY VIRGINIA ET ALS
AS THEIR INTEREST MAY APPEAR
DB 41 PG 213
Sq. Ft. 92,961 / 2.13 Acres

(005) HERMINA R ROBBERECHT
WB 71 PG 434
Tax* 83A4-A-24

(003) SINCLAIR TELECABLE INC
DB 267 PG 200
PB 8 PG 108
1.60 AC.
Tax* 83A3-A-16

(001) TOWN OF CAPE CHARLES
DB 164 PG 614
PB 8 PG 108
22.17 AC
Tax* 83A3-A-14

(006) BAY CREEK SOUTH LLC
Inst. *140000761
PB 26 PG 52
Tax* 90-2-B

OLD CAPE CHARLES ROAD
50' Easement
Proposed Old Cape Charles Road Construction
POT 22+59.54

Match Line Sta. 113+00 See Sheet No. 3RW

Match Line Sta. 127+00 See Sheet No. 5RW

Proposed Route 642 Construction ℄

N 78° 23' 43" E

S78°23'43"W 824.50'

S24°33'53"W 48.21'

S78°43'03"W 249.37'

Station 114+00.00
N=3,628,468.841
E=12,207,089.808

Station 120+00.00
N=3,628,589.537
E=12,207,677.543

150' Eastern Shore Public Service Company Of Virginia Right Of Way And Easement DB 143 Pg 342

(30' Ingress / Egress Easement)

30' Easement

(002) SOUTH PORT INVESTORS LLC
Inst *080000441
PB 39 PG 88 THRU
PB 27 PG 23
80.66 AC
Tax* 90-A-1A

(007) CROSBY H JOHNSON
EDITH E JOHNSON
Inst * 040001310
PB 29 PG 29
Tax* 90-6-16

(008) LAUREN A SFEKAS
Inst * 070002252
PB 29 PG 29
Tax* 90-6-15

(009) RAYMOND SALOPEK
SANDRA M SALOPEK
Inst *100000249
PB 29 PG 29
Tax* 90-6-14

(010) BAY CREEK SOUTH LLC
Inst *140002065
Plat Inst *140002064
Tax* 90-06-B2

(016) JUSTIN HARTFORD
JACQUELINE OSMOND HARTFORD
TRUSTEES
Inst *090000257
PB 29 PG 29
Tax* 90-6-17

(018) FRANK T NICO
PAULA A NICO
Inst *040000792
Inst *120000892
PB 29 PG 29
Tax* 90-6-13 & 90-6-12

LEGEND

- Computed Point
- Monumentation Found (As Noted)
- RM-2 (5/8" Rebar w/Cap)
- Indicates Permanent Easement
- Indicates Easement

LINE LEGEND

- CALCULATED FROM CONSTRUCTION ℄
- PROPOSED R/W
- (4) VARIABLE WIDTH PERMANENT STANDARD UTILITY EASEMENT REQUIRED FOR VERIZON VA.,LLC AND VDOT UTILITY EASEMENT
- (5) VARIABLE WIDTH PERMANENT STANDARD UTILITY EASEMENT REQUIRED FOR A&N ELECTRIC COOPERATIVE,VERIZON VA.,LLC AND VDOT UTILITY EASEMENT
- (6) VARIABLE WIDTH PERMANENT STANDARD VDOT UTILITY EASEMENT

LINE TABLE

LINE	BEARING	DISTANCE
L2	N27°14'33"E	32.99'
L3	N11°19'06"W	7.86'
L4	S50°57'53"E	10.09'
L5	S77°54'17"W	166.98'
L6	S11°33'55"E	22.42'
L7	S11°32'50"E	6.63'
L8	S78°24'52"W	56.05'
L9	S78°24'52"W	56.00'
L10	S78°24'52"W	40.62'
L11	N71°18'20"W	21.19'
L12	N11°19'06"W	26.98'

CURVE TABLE

CURVE	DELTA	RADIUS	ARC LENGTH	CHORD BEARING	CHORD LENGTH
C1	2°24'24" (RT)	367.35'	15.43'	S 79°44'49" W	15.43'
C2	8°48'16" (RT)	367.35'	56.45'	N 85°10'05" E	56.39'
C3	9°05'07" (RT)	367.35'	58.29'	S 85°51'23" E	58.22'
C4	4°27'33" (RT)	367.35'	28.59'	S 79°08'40" E	28.50'

NOTE: All Stations And Offsets Are From The Construction Baseline
Bearings And Distances In Parenthesis Are Record Data

FOR PARCEL AREAS REFER TO SHEET 4(2)RW

GENERAL NOTES:

1. Plan Sheet Is Intended For Acquisition Only And Does Not Constitute A Boundary Survey.
2. Property Line Information Based on Plats And Deeds Of Record. Limited Field Work Performed In The Creation Of This Plan Sheet.
3. Plan Sheet Was Prepared Without The Benefit Of A Title Report, Consequently Not All Encumbrances May Be Depicted.
4. This Plan Sheet Was Forwarded Electronically In "Read Only" Format. Any Attempt At Alteration Invalidates The Seal And Signature. An Original Hard Copy Remains On File At The Virginia Department Of Transportation, Hampton Roads District Office
5. Physical Improvements Are Not Shown.

SCALE	PROJECT	SHEET NO.
0 25' 50' 100'	0642-065-577	4(1)RW

RIGHT OF WAY PLAN SHEET SHOWING PROPERTY FOR COMMONWEALTH OF VIRGINIA

Town Of Cape Charles
Northampton County, Virginia
Scale 1" = 50'
Surveyed By Danny R.Williams, L.S., CFM
January 15, 2014

COMMONWEALTH OF VIRGINIA
DANNY ROY WILLIAMS
Lic. No. 2652
LAND SURVEYOR

Danny R Williams
2015.11.17 11:38:16 -05'00'
VDOT Location and Design
Suffolk, Virginia
LAND SURVEYOR

REVISED	STATE	STATE ROUTE	STATE PROJECT	SHEET NO.
	VA.	642	0642-065-577, RW-201, C-501	5RW

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CURVE TABLE

CURVE	DELTA	RADIUS	ARC LENGTH	CHORD BEARING	CHORD LENGTH
C1	01°21'00" (LT)	825.00'	19.44'	N 76°58'22" E	19.44'
C2	11°33'45" (LT)	825.00'	166.49'	N 56°03'34" E	166.21'
C3	03°49'25" (LT)	450.00'	30.03'	S 80°18'30" W	30.02'
C5	10°45'44" (RT)	925.00'	173.75'	S 68°12'04" W	173.49'
C6	0°07'48" (RT)	2662.68'	6.04'	S 78°19'49" W	6.04'
C7	1°48'26" (RT)	1600.00'	50.47'	S 34°34'58" W	50.47'
C8	03°07'23" (RT)	2662.68'	145.13'	S 76°42'13" W	145.12'

NAD 83 (NSRS 2011)

(006) BAY CREEK SOUTH LLC
Inst #140000761
PB 26 PG 52
Tax# 90-2-B

Parcel 006 Area Calculations

Proposed Right of Way	Sq. Ft. 508,607 / 11.68 Acres
Proposed Variable Width Permanent Standard Utility Easement Required For A&N Electric Cooperative, Verizon Va., LLC And VDOT Utility Easement.	Sq. Ft. 47,677 / 1.09 Acres
Proposed Temporary Construction Easement	Sq. Ft. 62,204 / 1.43 Acres
Proposed Variable Width Permanent Standard VDOT Utility Easement	Sq. Ft. 6,001 / 0.14 Acre

(015) NORTHAMPTON COUNTY VIRGINIA ET ALS
AS THEIR INTEREST MAY APPEAR
DB 41 PG 213
Sq. Ft. 92,961 / 2.13 Acres

PI = 138+18.49
DELTA = 32° 55' 46.8" (LT)
D = 6° 32' 53"
T = 180.44'
L = 355.89'
R = 875.00'
LS IN = LS OUT = 147.00'
TS = 134+86.10
SC = 136+33.10
CS = 139+88.99
ST = 141+35.99

Match Line Sta. 127+00 See Sheet No. 4RW

N78°23'43"E 896.21'

N 78° 23' 43" E 1,694.52'

Proposed Route 642 Construction @

N78°23'07"E 1226.85'

N78°23'07"E 279.39'

N66°11'47"E 122.96'

N47°02'46"E 142.76'

S78°23'43"W 336.89'

S78°23'43"W 498.69'

S78°23'43"W 27.99'

S46°12'26"W 232.26'

30' Easement

Station 128+00.00
N= 3,628,750.465
E= 12,208,461.190

TS 134+86.10
N= 3,628,888.481
E= 12,209,133.265

Match Line Sta. 141+00 See Sheet No. 6RW

(030) BAY CREEK AT CAPE CHARLES COMMUNITY ASSOCIATION INC
Inst #030001268
Plat Inst #140002064
Tax# 90-06-CAI

Parcel 030 Area Calculations

Proposed Variable Width Permanent Standard Utility Easement Required For Verizon Va., LLC And VDOT Utility Easement — Sq. Ft. 6,100 / 0.14 Acre

(010) BAY CREEK SOUTH LLC
Inst #140002065
Plat Inst #140002064
1.82 AC.
Tax# 90-06-B2

Parcel 010 Area Calculations

Proposed Right of Way	Sq. Ft. 39,717 / 0.91 Acre
Proposed Temporary Construction Easement	Sq. Ft. 3,371 / 0.08 Acre
Proposed Variable Width Permanent Standard Utility Easement Required For Verizon Va., LLC And VDOT Utility Easement	Sq. Ft. 6,450 / 0.15 Acre

(004) BAY CREEK SOUTH LLC
Inst #140002065
Plat Inst #140002064
PB 27 PG 41
Tax# 90-2-1

(004) BAY CREEK SOUTH LLC
Inst #140000761
PB 27 PG 41
PB 32 PG 34-39
49.95 AC.
Tax# 90-A-16

Parcel 004 Area Calculations

Proposed Right of Way	Sq. Ft. 19,224 / 0.44 Acre
Proposed Variable Width Permanent Standard Utility Easement Required For A&N Electric Cooperative, Verizon Va., LLC And VDOT Utility Easement	Sq. Ft. 2,795 / 0.06 Acre
Proposed Variable Width Permanent Standard Utility Easement Required For Verizon Va., LLC And VDOT Utility Easement	Sq. Ft. 6,100 / 0.14 Acre

LINE LEGEND

- +00.00 / 00.00' — CALCULATED FROM CONSTRUCTION @
- 00.00' / +00.00 — (1) PROPOSED R/W
- (00.00' / +00.00) — (3) PROPOSED TEMPORARY CONSTRUCTION EASEMENT
- [00.00' / +00.00] — (4) VARIABLE WIDTH PERMANENT STANDARD UTILITY EASEMENT REQUIRED FOR VERIZON VA.,LLC AND VDOT UTILITY EASEMENT
- 00.00' / +00.00 — (5) VARIABLE WIDTH PERMANENT STANDARD UTILITY EASEMENT REQUIRED FOR A&N ELECTRIC COOPERATIVE,VERIZON VA.,LLC AND VDOT UTILITY EASEMENT

LEGEND

- Computed Point
- Monumentation Found (As Noted)
- RM-2 (5/8" Rebar w/Cap)
- Indicates Permanent Easement
- Indicates Easement

NOTE: All Stations And Offsets Are From The Construction Baseline
Bearings And Distances In Parenthesis Are Record Data

SCALE 0 25' 50' 100'

PROJECT	SHEET NO.
0642-065-577	5RW

RIGHT OF WAY PLAN SHEET SHOWING PROPERTY FOR COMMONWEALTH OF VIRGINIA

Town Of Cape Charles
Northampton County, Virginia
Scale 1" = 50'
Surveyed By Danny R. Williams, L.S., CFM
January 15, 2014

PRELIMINARY

VDOT Location and Design
Suffolk, Virginia
LAND SURVEYOR

REVISED	STATE	STATE ROUTE	STATE PROJECT	SHEET NO
	VA.	642	0642-065-577, RW-201, C-501	6RW

NAD 83 (NSRS 2011)

Match Line Sta. 141+00 See Sheet No. 5RW

PI = 138+18.49
DELTA = 32° 55' 46.84" (LT)
D = 6° 32' 53"
T = 180.44'
L = 355.89'
R = 875.00'
LS IN = LS OUT = 147.00'
TS = 134+86.10
SC = 136+33.10
CS = 139+88.99
ST = 141+35.99

ST 141+35.99
N 47°09'46"E 142.76'
N 45°27'56"E 232.00'
ST 141+35.99
N: 3,628,188.462
E: 12,209,695.797

PI = 146+56.18
DELTA = 30° 55' 32.93" (LT)
D = 7° 42' 04"
T = 119.81'
L = 237.58'
R = 744.00'
LS IN = LS OUT = 164.00'
TS = 143+67.99
SC = 145+31.99
CS = 147+69.57
SRS = 149+33.57

TS 143+67.99
N: 3,629,351.171
E: 12,209,861.171
N 43°23'51"E 158.40'
N 45° 27' 56" E

TS 10+49.11
S 47°56'28"E 83.23'
S 45°27'56"W 74.40'

CS 13+45.42
S 78°23'43"W 43.43'
N 78°17'57"E 224.51'
S 78°17'57"W 224.51'
N 78° 17' 57" E

SC 12+20.11
N 78°23'07"E 385.34'

ST 15+16.42

POT 16+53.69
POT 18+20.00

Proposed Old Cape Charles Construction

Existing 200' Private Ingress/Egress & Utility Easement

Proposed Route 642
Construction ℄

N16°36'19"E 158.40'
S16°36'19"W 158.40'

CS 147+69.57
SRS 149+33.57
SC 150+97.57

Match Line Sta. 154+00 See Sheet No. 7RW

PI = 154+29.42
DELTA = 58° 04' 31.84" (RT)
D = 7° 42' 04"
T = 311.57'
L = 590.13'
R = 744.00'
LS IN = LS OUT = 164.00'
SRS = 149+33.57
SC = 150+97.57
CS = 156+87.69
ST = 158+51.69

N12°47'32"W 170.00'
N12°44'29"W 105.69'
N45°51'18"W 112.81'

Existing 170' Private Ingress/Egress & Utility Easement

(1665.37')
(1200.05')

162.81'
•91.80

50.00'
•90.63

006
BAY CREEK SOUTH LLC
Inst #140002065
PB 27 PG 41
Tax# 90-2-1

006
BAY CREEK SOUTH LLC
Inst #140000761
PB 26 PG 52
Tax# 90-2-B

015
NORTHAMPTON COUNTY VIRGINIA ET ALS
AS THEIR INTEREST MAY APPEAR
DB 45 PG 160
DB 41 PG 213
Sq. Ft. 92,961 / 2.13 Acres

004
BAY CREEK SOUTH LLC
Inst #140000761
PB 27 PG 41
PB 32 PG 34-39
49.96 AC
Tax# 90-A-16

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Proposed Right of Way	Sq. Ft. 19,224 / 0.44 Acre
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Proposed Variable Width Permanent Standard Utility Easement Required For Verizon Va. ,LLC And VDOT Utility Easement	Sq. Ft. 6,100 / 0.14 Acre

Parcel 006 Area Calculations

Proposed Right of Way	Sq. Ft. 508,607 / 11.68 Acres
Proposed Variable Width Permanent Standard Utility Easement Required For A&N Electric Cooperative, Verizon Va. ,LLC And VDOT Utility Easement	Sq. Ft. 47,677 / 1.09 Acres
Proposed Temporary Construction Easement	Sq. Ft. 62,204 / 1.43 Acres
Proposed Variable Width Permanent Standard VDOT Utility Easement	Sq. Ft. 6,001 / 0.14 Acre

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5. Physical Improvements Are Not Shown.

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CURVE TABLE

CURVE	DELTA	RADIUS	ARC LENGTH	CHORD BEARING	CHORD LENGTH
C1	18°17'45" (LT)	694.00'	221.61'	N 30°00'09" E	220.67'
C2	04°16'41" (RT)	2269.61'	169.46'	N 16°40'50" E	169.39'
C3	22°34'14" (RT)	794.00'	312.78'	N 32°08'17" E	310.77'
C4	04°16'41" (RT)	2269.61'	169.46'	S 43°19'36" W	169.42'
C5	18°17'47" (RT)	794.00'	253.55'	S 30°00'09" W	252.47'
C6	04°16'41" (RT)	2269.61'	169.46'	S 16°40'52" W	169.42'
C7	45°26'46" (LT)	694.00'	550.47'	S 43°34'39" W	536.15'
C8	18°42'32" (RT)	366.00'	119.51'	N 57°19'45" W	118.98'
C9	25°43'08" (RT)	366.00'	164.29'	N 88°50'29" W	162.92'
C10	53°43'36" (LT)	266.00'	249.43'	S 74°50'16" E	240.39'

LINE LEGEND

•00.00 / 00.00' — CALCULATED FROM CONSTRUCTION ℄
00.00' / •00.00 — (1) PROPOSED R/W
[00.00' / 00.00] — (5) VARIABLE WIDTH PERMANENT STANDARD UTILITY EASEMENT REQUIRED FOR A&N ELECTRIC COOPERATIVE, VERIZON VA. ,LLC AND VDOT UTILITY EASEMENT

LEGEND

- Monumentation Found (As Noted)
- RW-2 (5/8" Rebar w/Cap)
- Indicates Permanent Easement
- Indicates Easement

SCALE 0 25' 50' 100'

PROJECT	SHEET NO
0642-065-577	6RW

PROJECT MANAGER: Neil Zaman, P.E. (757) 925-1605 (Hampton Roads)
SURVEYED BY, DATE: Darcy Williams, L.S. (757) 925-2657 (Hampton Roads) 8/3/2015
DESIGN BY: Michael Baker International (757) 463-8770
SUBSURFACE UTILITY BY, DATE: JMT (757) 499-1895 7/22/2015

Michael Baker International
Virginia Beach, Virginia
Roadway

REVISED	STATE	STATE ROUTE	STATE PROJECT	SHEET NO.
	VA.	642	0642-065-577, RW-201, C-501	3

DESIGN FEATURES RELATING TO CONSTRUCTION OR TO REGULATION AND CONTROL OF TRAFFIC MAY BE SUBJECT TO CHANGE AS DEEMED NECESSARY BY THE DEPARTMENT

Utility Owners

Delmarva Power
Ms. Shirley Banks PH*(757-442-1953)
Distribution Engineering Dept.
4174 Lankford Highway
PO Box 608
Exmore, VA 23350

Verizon Virginia Inc.
Mr. Richard S. Owen
2920 Elmhurst Lane
Portsmouth, VA 23701-2739
757-667-3110

Accomac-Northampton Electric Co-op.
Mr. Vernon N. Brinkley, Mgr.
P.O. Box 290
21275 Cooperative Way
Tasley, VA 23441
757-787-9750

Bayshore CATV, Inc.
Mr. H.C. Dize, President
5 North Street
Onancock, VA 23417
757-787-2602

001
TOWN OF CAPE CHARLES

NORTHAMPTON COUNTY

BAYSHORE ROAD

SINCLAIR TELECABLE INC
003

Parcel 001

BEGIN PROJECT 0642-065-577, PE-101
STA. 100+00.00

BEGIN PROJECT 0642-065-577, RW-201
STA. 100+35.00

(2) Curve RTE642_PR03_2
PI = 106+02.87
DELTA = 6° 55' 18.57" (LT)
D = 1° 02' 30"
T = 332.63'
L = 664.45'
R = 5,500.00'
PRC = 102+70.24
PT = 109+34.69
Lr = 0'
V = 40 mph
E = NC

RCD Type I Modified, L=12', (Detail B, Sheet 2D-3)
Perm. SWM Structure
(To remain in place after project completion)

RCD Type I Modified, L=12', (Detail A, Sheet 2D-3)
Perm. SWM Structure
(To remain in place after project completion)

Variable Width Permanent Standard Utility Easement Required for A&N Electric Cooperative, Verizon VA, LLC. and VDOT Utility Easement.

12" Std. PE-1, Type I Entrance Reqd. 7.15%

003
SINCLAIR TELECABLE INC

TOWN OF CAPE CHARLES

POT 100+00.00

IP-C 3-2

101 102 103 104 105 106 107 108 109 110 111 112

PT 109+34.69

IP-C 3-3

3-6

Proposed R/W
4' Paved Shoulder
4' Graded Shoulder

Prop. Temp. Constr. Easement for Entrance

R.50'

N 83° 32' 13" E

R.20'

N 78° 23' 43" E
Prop. Rte 642 Constr. ℄

Match Line Sta. 113+00 See Sheet No. 4

PC 101+00.00

PRC 102+70.24

Proposed R/W
4' Paved Shoulder
4' Graded Shoulder

SWM 3-1

SWM 3-2

Proposed R/W

Variable Width Permanent Standard Utility Easement Required for A&N Electric Cooperative, Verizon VA, LLC. and VDOT Utility Easement.

3-7
3-5
3-4
IP-C

3-8

ROUTE 1117

BEGIN CONSTRUCTION / BEGIN PROJECT 0642-065-577, C-501
STA. 100+12.00
MATCH EXISTING

SOUTH PORT INVESTORS LLC

002
SOUTH PORT INVESTORS LLC

(1) Curve RTE642_PR03_1
PI = 101+85.13
DELTA = 1° 46' 24.42" (RT)
D = 1° 02' 30"
T = 85.13'
L = 170.24'
R = 5,500.00'
PC = 101+00.00
PRC = 102+70.24
Lr = 0'
V = 40 mph
E = NC

Existing Pipe to be removed
Existing Pipe to be cleaned out
Existing Structure to be removed

Prop. Ditch Type A

2' 4:1 Cut or Fill Slope

See Cross Section for Elevations

RIGHT				
Station	Elev. to	Station	Elev.	
100+50	5.4	105+00	10.5	2' Bottom Width, Water Quality Swale
105+00	10.5	108+00	8.4	
108+00	8.4	110+50	7.7	

LEFT				
Station	Elev. to	Station	Elev.	
100+50	5.5	106+00	9.7	2' Bottom Width, Water Quality Swale
109+50	9.5	110+50	8.5	

LEGEND

- Denotes Proposed Pavement
- Denotes Pavement Milling and Overlay
- Denotes Demolition of Pavement
- C ---- Denotes Construction Limits In Cuts
- F ---- Denotes Construction Limits In Fills
- [.00' / -.00'] Figures in brackets and dot - dashed lines denote Permanent Easements.
- [[.00' / -.00']] Figures in double brackets and dot - dashed lines denote Utility Easements.
- (.00' / -.00') Figures in parenthesis and dot - dot - dashed lines denote Temporary Easements.

Orange safety fence shall be placed at the limit of disturbance adjacent to permitted wetland impact areas and along the wetland boundary adjacent to the project area. No unauthorized encroachment or impact to wetlands shall occur other than locations authorized by the water quality permit.

REFERENCES
(PROFILES, DETAIL & DRAINAGE DESCRIPTION SHEETS, ETC.)

Profile Sheet	3A
Drainage Descr.	3B
Alignment Data	1G
General Notes	2
Entrance Profiles	10(1) - 10(2)
BMP Detail	2D(1)

SCALE 0 50' 100

PROJECT 0642-065-577

SHEET NO. 3

PROJECT MANAGER: Wail Zeman, P.E. (757) 925-1605 (Hampton Roads)
SURVEYED BY, DATE: Danny Williams, L.S. (757) 925-2657 (Hampton Roads) 8/3/2015
DESIGN BY: Michael Baker International (757) 463-8770
SUBSURFACE UTILITY BY, DATE: JNC (757) 499-1895 7/22/2015

REVISED	STATE	STATE ROUTE	STATE PROJECT	SHEET NO
	VA.	642	0642-065-577, RW-201, C-501	4

DESIGN FEATURES RELATING TO CONSTRUCTION OR TO REGULATION AND CONTROL OF TRAFFIC MAY BE SUBJECT TO CHANGE AS DEEMED NECESSARY BY THE DEPARTMENT

Michael Baker International
Virginia Beach, Virginia
Roadway

Utility Owners

Delmarva Power
Ms. Shirley Banks PH*(757-442-1953)
Distribution Engineering Dept.
4174 Lankford Highway
PO Box 608
Exmore, VA 23350

Verizon Virginia Inc.
Mr. Richard S. Owen
2920 Elmhurst Lane
Portsmouth, VA 23701-2739
757-667-3110

Accomac-Northampton Electric Co-op.
Mr. Vernon N. Brinkley, Mgr.
P.O. Box 290
21275 Cooperative Way
Tasley, VA 23441
757-787-9750

Bayshore CATV, Inc.
Mr. H.C. Dize, President
5 North Street
Onancock, VA 23417
757-787-2602

ROBBERECHT SEAFOOD INC.

OLD CAPE CHARLES ROAD

Variable Width Permanent Standard Utility Easement Required for A&N Electric Cooperative, Verizon VA, LLC. and VDOT Utility Easement.

Variable Width Permanent Standard Utility Easement Required for A&N Electric Cooperative, Verizon VA, LLC. and VDOT Utility Easement.

001
TOWN OF CAPE CHARLES

End Construction Sta. 22+00.00
Prop. Old Cape Charles Road
Constr. B.L.
Match Existing

Orange safety fence shall be placed at the limit of disturbance adjacent to permitted wetland impact areas and along the wetland boundary adjacent to the project area. No unauthorized encroachment or impact to wetlands shall occur other than locations authorized by the water quality permit.

003
SINCLAIR TELECABLE INC

HERMINA R. ROBBERECHT
005

015
POT 22+59.54

006
BAY CREEK SOUTH LLC

22
VARIABLE WIDTH PERMANENT STANDARD VDOT UTILITY EASEMENT

NORTHAMPTON COUNTY VIRGINIA ET ALS

12" Std. PE-1, Type I Entrance Rec'd. 5.64%

Variable Width Permanent Standard Utility Easement Required for A&N Electric Cooperative, Verizon VA, LLC. and VDOT Utility Easement.

4' Paved Shoulder
4' Graded Shoulder

21
Begin Construction Sta. 20+12.46
Prop. Old Cape Charles Road Constr. B.L.

Proposed R/W

N 27°17'23" W

N 78° 23' 43" E

Prop. Rte 642 Constr. ℄

Match Line Sta. 113+00 See Sheet No. 3

Match Line Sta. 127+00 See Sheet No. 5

4' Paved Shoulder
4' Graded Shoulder

Proposed R/W

Variable Width Permanent Standard Utility Easement Required for A&N Electric Cooperative, Verizon VA, LLC. and VDOT Utility Easement.

002
SOUTH PORT INVESTORS LLC

12" Std. PE-1, Type I Entrance Rec'd. 5.12%

P.O.T. 121+93.56
Prop. Route 642 Constr. B.L.
P.I. 20+00.00
Prop. Old Cape Charles Road Constr. B.L.
Δ = 105° 35' 6.1" Lt.

Prop. Ditch Type A

2H 4:1 Cut or Fill Slope

See Cross Section for Elevations

LEFT				RIGHT			
Station	Elev. to	Station	Elev.	Station	Elev. to	Station	Elev.
113+00	8.0	116+00	10.5	113+00	8.5	116+50	10.5
120+00	10.8	121+50	10.4	117+50	8.5	119+20	9.7
122+50	10.3	133+50	8.0	120+00	10.5	133+50	8.0

016
B CROSBY H. JOHNSON
EDITH E. JOHNSON
007

VARIABLE WIDTH PERMANENT STANDARD UTILITY EASEMENT REQUIRED FOR VERIZON VA, LLC AND VDOT UTILITY EASEMENT.

C LAUREN A. SFEKAS
008

D RAYMOND SALOPEK
SANDRA M. SALOPEK
009

BAY CREEK SOUTH LLC
010

E FRANK T. NICO
PAULA A. NICO

F FRANK T. NICO
PAULA A. NICO
018

JUSTIN HARTFORD
L JACQUELINE OSMOND HARTFORD
TRUSTEES
016

LEGEND

- Denotes Proposed Pavement
- Denotes Pavement Milling and Overlay
- Denotes Demolition of Pavement
- C ---- Denotes Construction Limits In Cuts
- F ---- Denotes Construction Limits In Fills
- [00'-00] Figures in brackets and dot - dashed lines denote Permanent Easements.
- [[00'-00]] Figures in double brackets and dot - dashed lines denote Utility Easements.
- (00'-00) Figures in parenthesis and dot - dot - dashed lines denote Temporary Easements.

- Existing Pipe to be removed
- Existing Pipe to be cleaned out
- Existing Structure to be removed

REFERENCES
(PROFILES, DETAIL & DRAINAGE DESCRIPTION SHEETS, ETC.)

Profile Sheet	4A
Drainage Descr.	3B
Alignment Data	1G
General Notes	2
Entrance Profiles	10(1) - 10(2)

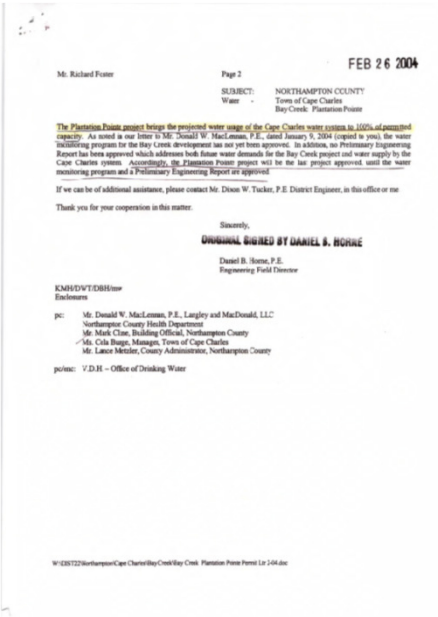
SCALE	PROJECT	SHEET NO.
0 50 100	0642-065-577	4

Keck Wells

Quantity and Quality

Plantation Pointe and Fairways

- Feb 2004 plans submitted for Plantation Pointe
- ODW Comment: “The Plantation Pointe project brings the projected water usage of the Cape Charles water system to 100% of permitted capacity.”
- Plantation Pointe project will be the last project approved, until:
  - Water monitoring program
  - Approved PER
- PER was not submitted



FEB 26 2004

Mr. Richard Foster Page 2

SUBJECT: NORTHAMPTON COUNTY
Water : Town of Cape Charles
Bay Creek: Plantation Pointe

The Plantation Pointe project brings the projected water usage of the Cape Charles water system to 100% of permitted capacity. As noted in our letter to Mr. Donald W. MacLennan, P.E., dated January 9, 2004 (copied to you), the water monitoring program for the Bay Creek development has not yet been approved. In addition, no Preliminary Engineering Report has been approved which addresses both future water demands for the Bay Creek project and water supply by the Cape Charles system. Accordingly, the Plantation Pointe project will be the last project approved, until the water monitoring program and a Preliminary Engineering Report are approved.

If we can be of additional assistance, please contact Mr. Dixon W. Tucker, P.E. District Engineer, in this office or me

Thank you for your cooperation in this matter.

Sincerely,

ORIGINAL SIGNED BY DANIEL B. HORNE

Daniel B. Horne, P.E.
Engineering Field Director

KMH/DWT/DBH/mw
Enclosures

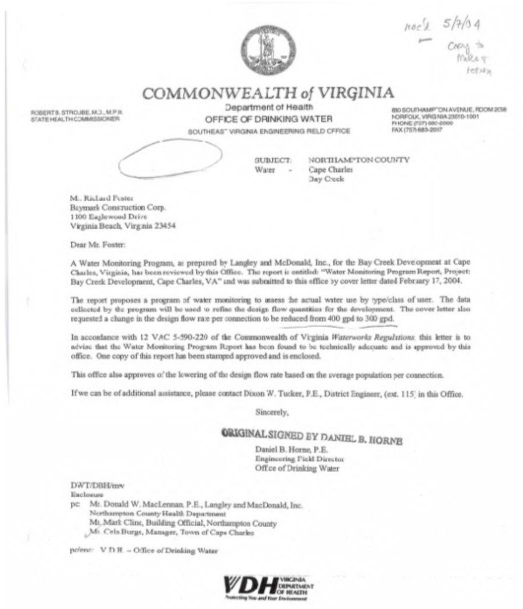
pc: Mr. Donald W. MacLennan, P.E., Langley and MacDonald, LLC
Northampton County Health Department
Mr. Mark Cline, Building Official, Northampton County
Ms. Cela Bunga, Manager, Town of Cape Charles
Mr. Lance Metzler, County Administrator, Northampton County

pc/enc: V.D.H – Office of Drinking Water

W:\285722\Northampton\Cape Charles\Bay Creek\Bay Creek Plantation Pointe Permit Ltr 2-04.doc

Plantation Pointe and Fairways

- May of 2004
- ODW approves Water Monitoring Program
- Reduces design flow rate
- 400 gpd, used by the ODW for design
- 300 gpd



rec'd 5/7/04
Copy to Mike & [illegible]

COMMONWEALTH of VIRGINIA
Department of Health
OFFICE OF DRINKING WATER
SOUTHEAST VIRGINIA ENGINEERING FIELD OFFICE

ROBERT B. STROUBE, M.D., M.P.H.
STATE HEALTH COMMISSIONER

830 SOUTHAMPTON AVENUE, ROOM 2058
NORFOLK, VIRGINIA 23510-1001
PHONE (757) 683-2000
FAX (757) 683-2007

SUBJECT: NORTHAMPTON COUNTY
Water - Cape Charles
Bay Creek

Mr. Richard Foster
Baymark Construction Corp.
1100 Eaglewood Drive
Virginia Beach, Virginia 23454

Dear Mr. Foster:

A Water Monitoring Program, as prepared by Langley and McDonald, Inc., for the Bay Creek Development at Cape Charles, Virginia, has been reviewed by this Office. The report is entitled: "Water Monitoring Program Report, Project: Bay Creek Development, Cape Charles, VA" and was submitted to this office by cover letter dated February 17, 2004.

The report proposes a program of water monitoring to assess the actual water use by type/class of user. The data collected by the program will be used to refine the design flow quantities for the development. The cover letter also requested a change in the design flow rate per connection to be reduced from 400 gpd to 300 gpd.

In accordance with 12 VAC 5-590-220 of the Commonwealth of Virginia *Waterworks Regulations*, this letter is to advise that the Water Monitoring Program Report has been found to be technically adequate and is approved by this office. One copy of this report has been stamped approved and is enclosed.

This office also approves of the lowering of the design flow rate based on the average population per connection.

If we can be of additional assistance, please contact Dixon W. Tucker, P.E., District Engineer, (ext. 115) in this Office.

Sincerely,

ORIGINAL SIGNED BY DANIEL B. HORNE
Daniel B. Horne, P.E.
Engineering Field Director
Office of Drinking Water

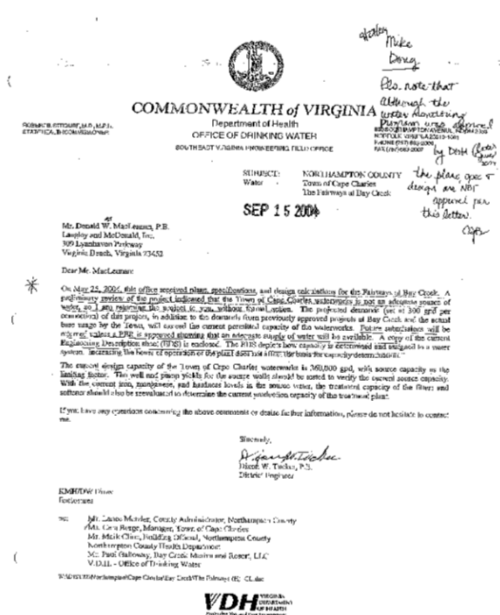
DWT/DBH/mrv
Enclosure
pc: Mr. Donald W. MacLennan, P.E., Langley and MacDonald, Inc.
Northampton County Health Department
Mr. Mark Cline, Building Official, Northampton County
Ms. Cela Burge, Manager, Town of Cape Charles

pc/enc: V.D.H. – Office of Drinking Water

VDH VIRGINIA DEPARTMENT OF HEALTH

Plantation Pointe and Fairways

- Same year
- Plans submitted for Fairways Condominiums.
- The plan was returned unapproved
- Comment from ODW:
  - "On May 25, 2004, this office received plans, … for the Fairways at Bay Creek. A preliminary review of the project indicated that the Town of Cape Charles Waterworks is not an adequate source of water…"



Mike
Doug
Pls. note that although the water monitoring program was approved by DWH (letter [illegible]), the plans spec & design are NOT approved per this letter.

COMMONWEALTH of VIRGINIA
Department of Health
OFFICE OF DRINKING WATER
SOUTHEAST VIRGINIA ENGINEERING FIELD OFFICE

SUBJECT: NORTHAMPTON COUNTY
Water - Town of Cape Charles
The Fairways at Bay Creek

SEP 15 2004

Mr. Donald W. MacLennan, P.E.
Langley and McDonald, Inc.
309 Lynnhaven Parkway
Virginia Beach, Virginia 23452

Dear Mr. MacLennan:

On May 25, 2004, this office received plans, specifications, and design calculations for the Fairways at Bay Creek. A preliminary review of the project indicated that the Town of Cape Charles waterworks is not an adequate source of water, so I am returning the project to you, without formal action. The projected demands (set at 300 gpd per connection) of this project, in addition to the demands from previously approved projects at Bay Creek and the actual base usage by the Town, will exceed the current permitted capacity of the waterworks. Future submissions will be returned unless a PER is approved showing that an adequate supply of water will be available. A copy of the current Engineering Description sheet (EDS) is enclosed. The EDS depicts how capacity is determined and assigned to a water system. Increasing the hours of operation of the plant does not affect the basis for capacity determination.

The current design capacity of the Town of Cape Charles waterworks is 360,000 gpd, with source capacity as the limiting factor. The well and pump yields for the source wells should be tested to verify the current source capacity. With the current iron, manganese, and hardness levels in the source water, the treatment capacity of the filters and softener should also be reevaluated to determine the current production capacity of the treatment plant.

If you have any questions concerning the above comments or desire further information, please do not hesitate to contact me.

Sincerely,

Dixon W. Tucker, P.E.
District Engineer

Enclosures

pc: Mr. [illegible], County Administrator, Northampton County
Ms. Cela Burge, Manager, Town of Cape Charles
Mr. Mark Cline, Building Official, Northampton County
Northampton County Health Department
Mr. Paul Galloway, Bay Creek Marina and Resort, LLC
V.D.H. - Office of Drinking Water

VDH VIRGINIA DEPARTMENT OF HEALTH

Plantation Pointe and Fairways

- May 2005 meeting
- Representatives from:
  - Baymark
  - Town
  - ODW
  - DEQ
- ODW: Town at permitted capacity
- ODW to consider a lower figure than the 300 gpd
- Baymark to work on a PER that would address
  - Water plant improvements
  - Water quality
  - Water quantity
  - Development of additional wells
  - Submit for well site approvals
  - Aquifer test plan.

- From ODW obtain an update well site approval.
- Prepare Aquifer Test Plan and submit that to DEQ
- PER Addressing
  - Water Quality & Quantity
  - Treatment Plant issues
  - Source capacity issues
- VDH to re-evaluate wells and treatment to establish new capacity.

East Well II

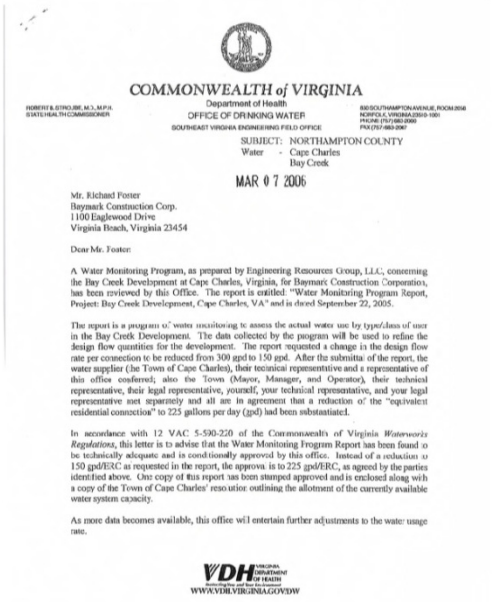
- Eastwell II Feb. 2006
- Middle Yorktown Aquifer
- Drilled to a depth of 225 feet
- Screened from 170-210 feet
- Tested at 70 gpm
- Actual yield 20 gpm
- Determined by Bundick Well and Pump that it had neither the quality nor the production capacity to be used as a production well for the Town.
- The decision was made to abandon efforts to bring the well on line.

Tower Well II

- Tower Well II Jan. 2006
- Lower Yorktown Aquifer
- Drilled to a total depth of 300 feet.
- Screened from 235-250 feet.
- Installed to meet the requirements of our Ground Water Withdrawal Permit Part II, Special Conditions
- When withdrawal exceeds 5.8 million gallons for any given month
- Required to withdraw 10% of our water from the lower aquifer.
- Exceeded that limit twice
- Requirement is removed from the draft permit with the addition of the Keck Wells
- 2008 estimated cost of connection to water plant $80k

Water Monitoring Program

- March of 2006
- ODW approved the Water Monitoring Program as prepared by Engineering Resources
- Design flow reduced from 300 gpd/connection
- 225 gpd/connection



COMMONWEALTH of VIRGINIA

Department of Health

OFFICE OF DRINKING WATER

SOUTHEAST VIRGINIA ENGINEERING FIELD OFFICE

SUBJECT: NORTHAMPTON COUNTY
Water - Cape Charles
Bay Creek

MAR 0 7 2006

Mr. Richard Foster
Baymark Construction Corp.
1100 Eaglewood Drive
Virginia Beach, Virginia 23454

Dear Mr. Foster:

A Water Monitoring Program, as prepared by Engineering Resources Group, LLC, concerning the Bay Creek Development at Cape Charles, Virginia, for Baymark Construction Corporation, has been reviewed by this Office. The report is entitled: "Water Monitoring Program Report, Project: Bay Creek Development, Cape Charles, VA" and is dated September 22, 2005.

The report is a program of water monitoring to assess the actual water use by type/class of user in the Bay Creek Development. The data collected by the program will be used to refine the design flow quantities for the development. The report requested a change in the design flow rate per connection to be reduced from 300 gpd to 150 gpd. After the submittal of the report, the water supplier (the Town of Cape Charles), their technical representative and a representative of this office conferred; also the Town (Mayor, Manager, and Operator), their technical representative, their legal representative, yourself, your technical representative, and your legal representative met separately and all are in agreement that a reduction of the "equivalent residential connection" to 225 gallons per day (gpd) had been substantiated.

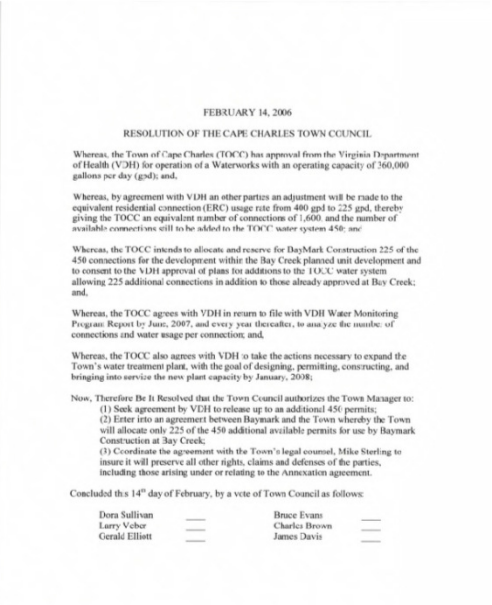
In accordance with 12 VAC 5-590-220 of the Commonwealth of Virginia *Waterworks Regulations*, this letter is to advise that the Water Monitoring Program Report has been found to be technically adequate and is conditionally approved by this office. Instead of a reduction to 150 gpd/ERC as requested in the report, the approval is to 225 gpd/ERC, as agreed by the parties identified above. One copy of this report has been stamped approved and is enclosed along with a copy of the Town of Cape Charles' resolution outlining the allotment of the currently available water system capacity.

As more data becomes available, this office will entertain further adjustments to the water usage rate.

VDH VIRGINIA DEPARTMENT OF HEALTH
WWW.VDH.VIRGINIA.GOV/DW

Water Monitoring Program "The Agreement"

- Connections available 450
- Town resolution
- 225 to Bay Creek
- 225 to the Town
- 135 Used so far
- 71 Bay Creek Used
- 64 Town Used
- 315 Remaining
- 154 Bay Creek
- 161 Town



FEBRUARY 14, 2006

RESOLUTION OF THE CAPE CHARLES TOWN COUNCIL

Whereas, the Town of Cape Charles (TOCC) has approval from the Virginia Department of Health (VDH) for operation of a Waterworks with an operating capacity of 360,000 gallons per day (gpd); and,

Whereas, by agreement with VDH an other parties an adjustment will be made to the equivalent residential connection (ERC) usage rate from 400 gpd to 225 gpd, thereby giving the TOCC an equivalent number of connections of 1,600 and the number of available connections still to be added to the TOCC water system 450; and

Whereas, the TOCC intends to allocate and reserve for BayMark Construction 225 of the 450 connections for the development within the Bay Creek planned unit development and to consent to the VDH approval of plans for additions to the TOCC water system allowing 225 additional connections in addition to those already approved at Bay Creek; and,

Whereas, the TOCC agrees with VDH in return to file with VDH Water Monitoring Program Report by June, 2007, and every year thereafter, to analyze the number of connections and water usage per connection; and,

Whereas, the TOCC also agrees with VDH to take the actions necessary to expand the Town's water treatment plant, with the goal of designing, permitting, constructing, and bringing into service the new plant capacity by January, 2008;

Now, Therefore Be It Resolved that the Town Council authorizes the Town Manager to:
(1) Seek agreement by VDH to release up to an additional 450 permits;
(2) Enter into an agreement between Baymark and the Town whereby the Town will allocate only 225 of the 450 additional available permits for use by Baymark Construction at Bay Creek;
(3) Coordinate the agreement with the Town's legal counsel, Mike Sterling to insure it will preserve all other rights, claims and defenses of the parties, including those arising under or relating to the Annexation agreement.

Concluded this 14th day of February, by a vote of Town Council as follows:

Dora Sullivan	___	Bruce Evans	___
Larry Veber	___	Charles Brown	___
Gerald Elliott	___	James Davis	___

Water Quality

- December 2006
- EPA final action for the Stage 2 Disinfectants and Disinfection Byproducts Rule
- Byproducts from chlorination of drinking water
- Trihalomethanes, TTHMs
- Haloacetic acids, HAA5s
- August of 2009 testing quarterly
- Running annual average.
- Some samples test higher than the acceptable limit for TTHMs.
- PER to discuss actions that might be taken to reduce the byproducts in our drinking water.

Disinfection Bi-products Phase II
4th Quarter 2013 to 4th Quarter 2015

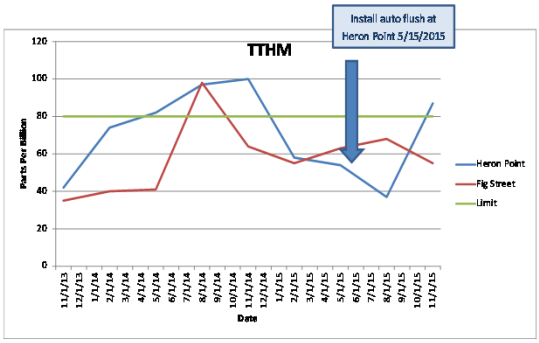
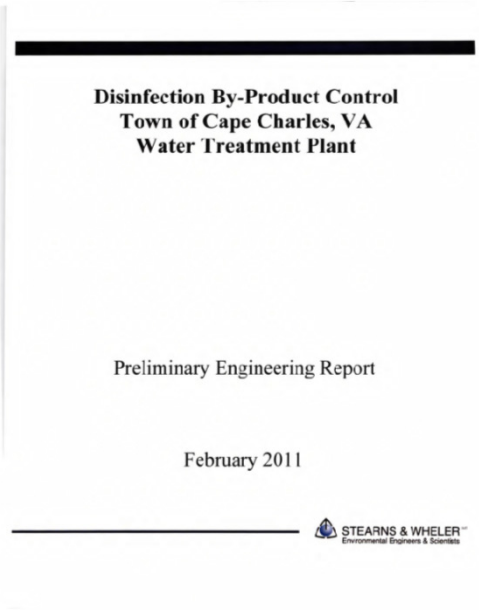


Fig Street Location is Rayfield's Pharmacy

Heron Point is 135 Heron Point Drive

Water Quality
PER

- PER submitted to ODW in February 2011
- Various factors that contribute to DBP formation:
  - Chlorine dose easily controlled.
  - Total Organic Carbon (TOC) quite low
  - Bromide most difficult to reduce


Disinfection By-Product Control
Town of Cape Charles, VA
Water Treatment Plant

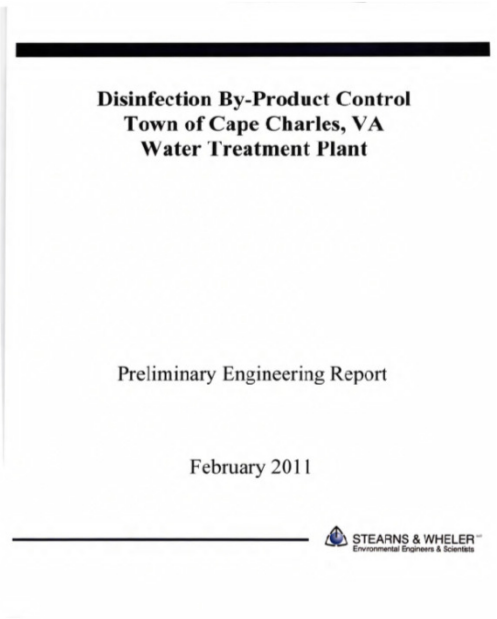
Preliminary Engineering Report

February 2011

STEARNS & WHELER

Water Quality
PER

- Proceed with developing the additional wells
- Keck Well #1 (165-608)
- Keck Well #2 (165-609)
- To improve production and raw water quality
- A comprehensive source water quality characterization should be performed with these wells


Disinfection By-Product Control
Town of Cape Charles, VA
Water Treatment Plant

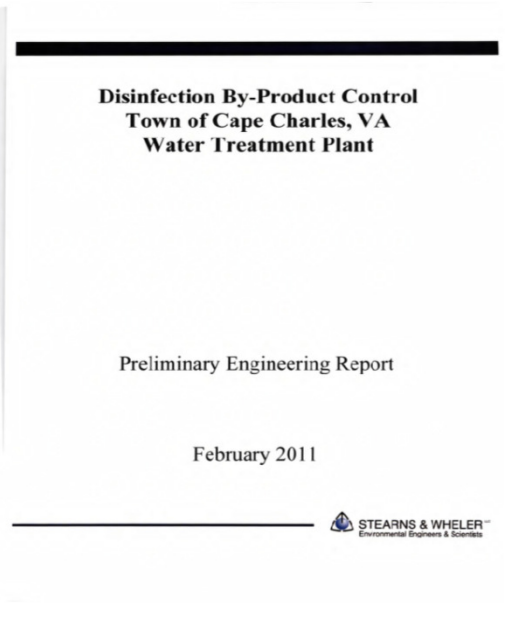
Preliminary Engineering Report

February 2011

STEARNS & WHELER
Environmental Engineers & Scientists

Water Quality
PER

- "If the comprehensive source water quality characterization indicates that the raw water is of good quality (low bromide, TOC etc.) then proceed with the development of these wells…" .


Disinfection By-Product Control
Town of Cape Charles, VA
Water Treatment Plant

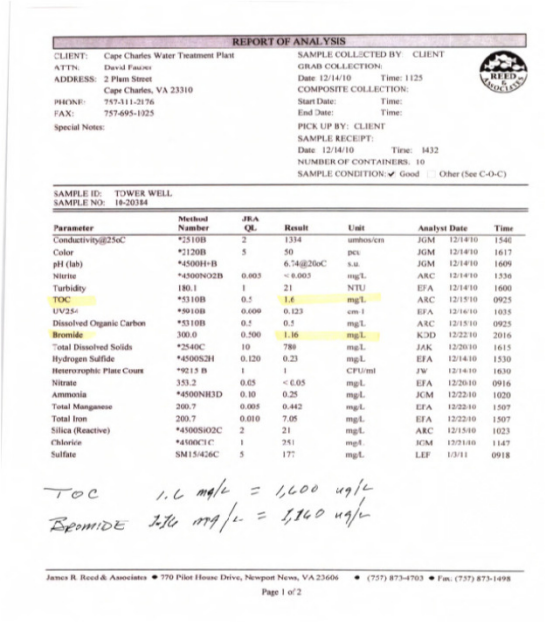
Preliminary Engineering Report

February 2011

STEARNS & WHELER
Environmental Engineers & Scientists

Water Quality
Water Sampling

- Tower Well
- DEQ 165-387
- TOC 1,600 ug/L
- Bromide 1,160 ug/L



REPORT OF ANALYSIS

CLIENT: Cape Charles Water Treatment Plant
ATTN: David Fauber
ADDRESS: 2 Plum Street, Cape Charles, VA 23310
PHONE: 757-311-2176
FAX: 757-695-1025
Special Notes:

SAMPLE COLLECTED BY: CLIENT
GRAB COLLECTION:
Date 12/14/10 Time: 1125
COMPOSITE COLLECTION:
Start Date: Time:
End Date: Time:
PICK UP BY: CLIENT
SAMPLE RECEIPT:
Date 12/14/10 Time: 1432
NUMBER OF CONTAINERS: 10
SAMPLE CONDITION: ✔ Good Other (See C-O-C)

SAMPLE ID: TOWER WELL
SAMPLE NO: 10-20384

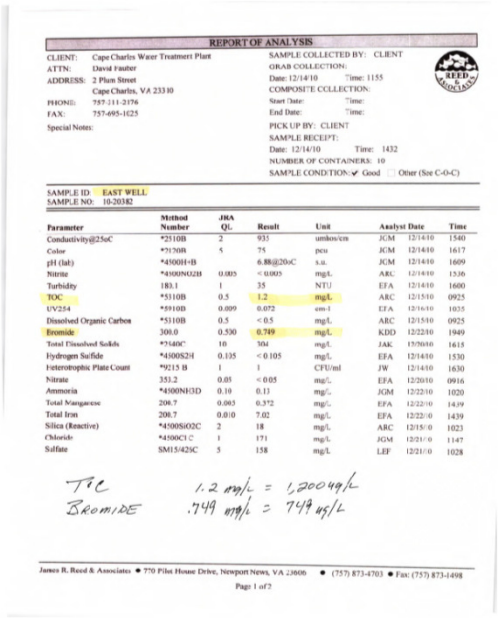
Parameter	Method Number	JRA QL	Result	Unit	Analyst	Date	Time
Conductivity@25oC	*2510B	2	1334	umhos/cm	JGM	12/14/10	1540
Color	*2120B	5	50	pcu	JGM	12/14/10	1617
pH (lab)	*4500H+B		6.74@20oC	s.u.	JGM	12/14/10	1609
Nitrite	*4500NO2B	0.003	< 0.003	mg/L	ARC	12/14/10	1336
Turbidity	180.1	1	21	NTU	EFA	12/14/10	1600
TOC	*5310B	0.5	1.6	mg/L	ARC	12/15/10	0925
UV254	*5910B	0.009	0.123	cm-1	EFA	12/16/10	1035
Dissolved Organic Carbon	*5310B	0.5	0.5	mg/L	ARC	12/15/10	0925
Bromide	300.0	0.500	1.16	mg/L	KDD	12/22/10	2016
Total Dissolved Solids	*2540C	10	780	mg/L	JAK	12/20/10	1615
Hydrogen Sulfide	*4500S2H	0.120	0.23	mg/L	EFA	12/14/10	1530
Heterotrophic Plate Count	*9215 B	1	1	CFU/ml	JW	12/14/10	1630
Nitrate	353.2	0.05	< 0.05	mg/L	EFA	12/20/10	0916
Ammonia	*4500NH3D	0.10	0.25	mg/L	JGM	12/22/10	1020
Total Manganese	200.7	0.005	0.442	mg/L	EFA	12/22/10	1507
Total Iron	200.7	0.010	7.05	mg/L	EFA	12/22/10	1507
Silica (Reactive)	*4500SiO2C	2	21	mg/L	ARC	12/15/10	1023
Chloride	*4500Cl C	1	251	mg/L	JGM	12/21/10	1147
Sulfate	SM15/426C	5	177	mg/L	LEF	1/3/11	0918

TOC 1.6 mg/L = 1,600 ug/L
BROMIDE 1.16 mg/L = 1,160 ug/L

James R. Reed & Associates • 770 Pilot House Drive, Newport News, VA 23606 • (757) 873-4703 • Fax: (757) 873-1498
Page 1 of 2

Water Quality
Water Sampling

- East Well III
- DEQ 165-558
- TOC 1,200 ug/L
- Bromide 749 ug/L



REPORT OF ANALYSIS

CLIENT: Cape Charles Water Treatment Plant
ATTN: David Fauber
ADDRESS: 2 Plum Street, Cape Charles, VA 23310
PHONE: 757-311-2176
FAX: 757-695-1025
Special Notes:

SAMPLE COLLECTED BY: CLIENT
GRAB COLLECTION:
Date: 12/14/10 Time: 1155
COMPOSITE COLLECTION:
Start Date: Time:
End Date: Time:
PICK UP BY: CLIENT
SAMPLE RECEIPT:
Date: 12/14/10 Time: 1432
NUMBER OF CONTAINERS: 10
SAMPLE CONDITION: ✔ Good Other (See C-O-C)

SAMPLE ID: EAST WELL
SAMPLE NO: 10-20382

Parameter	Method Number	JRA QL	Result	Unit	Analyst	Date	Time
Conductivity@25oC	*2510B	2	935	umhos/cm	JGM	12/14/10	1540
Color	*2120B	5	75	pcu	JGM	12/14/10	1617
pH (lab)	*4500H+B		6.88@20oC	s.u.	JGM	12/14/10	1609
Nitrite	*4500NO2B	0.005	< 0.005	mg/L	ARC	12/14/10	1336
Turbidity	180.1	1	35	NTU	EFA	12/14/10	1600
TOC	*5310B	0.5	1.2	mg/L	ARC	12/15/10	0925
UV254	*5910B	0.009	0.072	cm-1	EFA	12/16/10	1035
Dissolved Organic Carbon	*5310B	0.5	< 0.5	mg/L	ARC	12/15/10	0925
Bromide	300.0	0.530	0.749	mg/L	KDD	12/22/10	1949
Total Dissolved Solids	*2540C	10	504	mg/L	JAK	12/20/10	1615
Hydrogen Sulfide	*4500S2H	0.105	< 0.105	mg/L	EFA	12/14/10	1530
Heterotrophic Plate Count	*9215 B	1	1	CFU/ml	JW	12/14/10	1630
Nitrate	353.2	0.05	< 0.05	mg/L	EFA	12/20/10	0916
Ammonia	*4500NH3D	0.10	0.13	mg/L	JGM	12/22/10	1020
Total Manganese	200.7	0.005	0.372	mg/L	EFA	12/22/10	1439
Total Iron	200.7	0.010	7.02	mg/L	EFA	12/22/10	1439
Silica (Reactive)	*4500SiO2C	2	18	mg/L	ARC	12/15/10	1023
Chloride	*4500Cl C	1	171	mg/L	JGM	12/21/10	1147
Sulfate	SM15/425C	5	158	mg/L	LEF	12/21/10	1028

TOC 1.2 mg/L = 1,200 ug/L
BROMIDE .749 mg/L = 749 ug/L

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Page 1 of 2

Water Quality
Water Sampling

- Keck Well 1
- DEQ 165-608
- TOC 620 ug/L
- Bromide 82 ug/L

Client Sample Results

Client: Town of Cape Charles

Client Sample ID: KW-1

Lab Sample ID: 680-86966-1

Matrix: Drinking Water

Date Received: 01/30/13 10:30

Method: 515.1 - Herbicides (GC)

Method: 300.1B - Disinfection By-Products, (IC)

Bromide 82

Method: 531.1 - Carbamate Pesticides (HPLC)

Method: 549.2 - Diquat and Paraquat (HPLC)

Method: 1613B-Tetras - Dioxins/Furans, HRGC/HRMS (1613B-Tetras Only)

Method: 200.8 - Metals (ICP/MS)

General Chemistry

Nitrogen, Kjeldahl 0.59

Nitrate Nitrite as N 0.67

Total Organic Carbon 0.62 J

UV254 0.090

Nitrogen, Total 1.3

General Chemistry - Dissolved

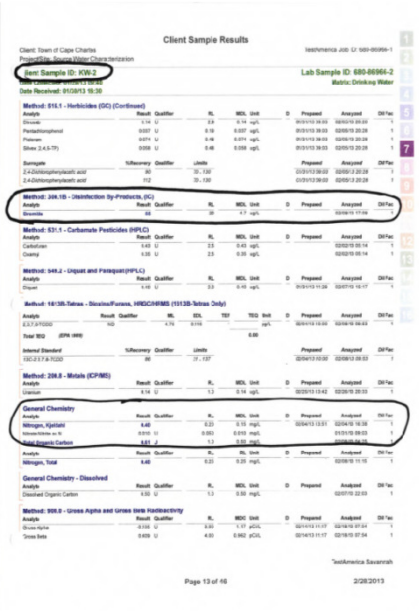
Dissolved Organic Carbon 1.50 U

Page 11 of 46

2/20/2013

Water Quality
Water Sampling

- Keck Well 2
- DEQ 165-609
- TOC 610 ug/L
- Bromide 55 ug/L



Client Sample Results

Client: Town of Cape Charles

Client Sample ID: KW-2

Lab Sample ID: 680-86966-2

Matrix: Drinking Water

Date Received: 01/30/13 10:30

Method: 515.1 - Herbicides (GC) (Continued)

Method: 300.1B - Disinfection By-Products, (IC)

Bromide 55

Method: 531.1 - Carbamate Pesticides (HPLC)

Method: 549.2 - Diquat and Paraquat (HPLC)

Method: 1613B-Tetras - Dioxins/Furans, HRGC/HRMS (1613B-Tetras Only)

Method: 200.8 - Metals (ICP/MS)

General Chemistry

Nitrogen, Kjeldahl 0.40

Total Organic Carbon 0.61 J

Nitrogen, Total 0.40

General Chemistry - Dissolved

Dissolved Organic Carbon 0.50 U

Method: 905.0 - Gross Alpha and Gross Beta Radioactivity

Page 13 of 46

2/28/2013

Water Quality Chloramines

- PER recommendation chloramines as an alternative disinfectant
- Addition of ammonia 10-20 minutes after chlorine application
- Cost $33,000 capital investment
- 20 year cost with chemicals included of $139,000

5. **Conclusions and Recommendations**

The type of post-filtration disinfectant used at the WTP is a significant factor in the formation of DBPs in the downstream distribution system. As the use of free chlorine is considered to be a contributing factor to elevated DBP concentrations, it is recommended that the Town convert to using chloramines for secondary disinfection during warmer months (March-August). It is expected that the use of chloramine in lieu of chlorine, along with optimization of chemical dosing rates and regular flushing of the distribution system will help reduce the DBP concentrations below the corresponding PMCLs.

Table 5 provides a preliminary opinion of probable cost for a 40% liquid ammonium sulfate system (assuming chlorine to ammonia-N ratio of 4:1), without the addition of the online chlorine and chloramine analyzers discussed under section 4.

Table 5 Opinion of Probable Cost for Implementation of Chloramine System

	Cost
Capital Cost[1]	$33,000
Annual O&M Cost[2]	$6,000
20-Year Life Cycle Cost[3]	$139,000

Notes
1. Capital cost includes chemical feed skid, static mixer, piping, containment area electrical wiring and conduits, and one day of programming.
2. O&M cost includes energy, chemicals and general maintenance.
3. 20-year life cycle cost assumes 3% inflation rate and 5% interest rate.

Before chloramines are implemented as the post-filtration disinfectant, the Town will need to conduct a public outreach program to notify customers about the impacts of the change in treatment. Specifically, disinfection with chloramine can cause issues for kidney dialysis patients and tropical fish in aquariums. Conversion to chloramine may also cause some differences in the taste or odor of the treated water. Generally, monochloramine has been reported to reduce issues with the taste and odor of water compared to chlorine, where dichloramine and trichloramine are associated with offensive tastes and odors. The use of chloramines can potentially increase the presence of algae in uncovered water storage facilities, and customers using the treated water in pools may need to add more chlorine than they would otherwise need to with chlorine disinfection at the WTP.

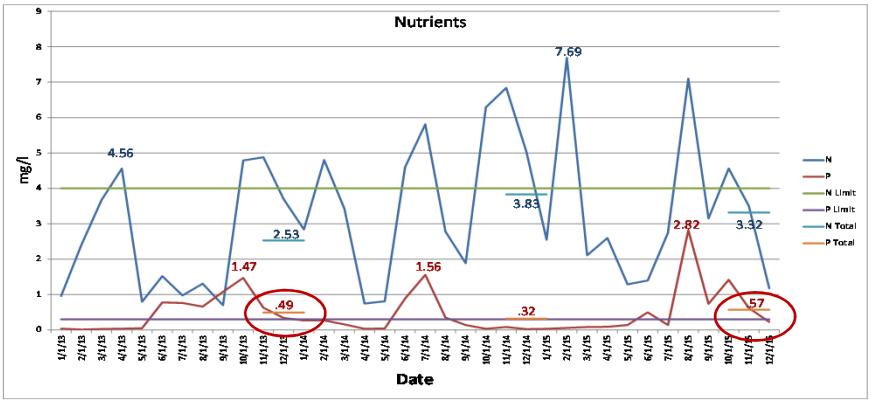
GHD | Town of Cape Charles – Chloramination System PER, 86/14899 | 15

Waste Water Nutrients

Waste Water Nutrients

Cape Charles WWTP

Nutrients 2013-2015



Waste Water Nutrients

- Nitrogen
- Plant designed to remove down to 3 mg/l
- Limit 4 mg/l
- $4,360 for each 0.1 mg/l over annual average
- No annual average exceedances for our plant

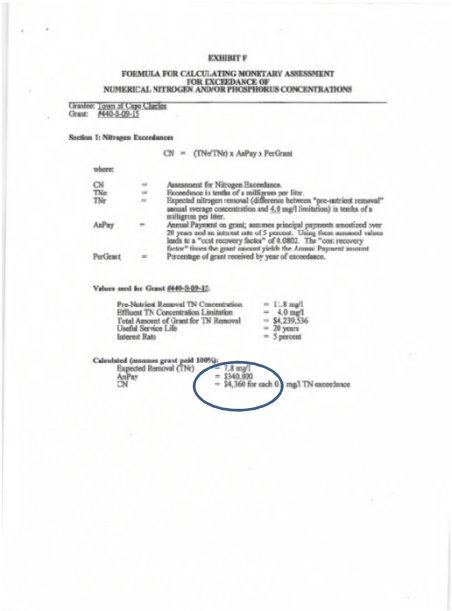


EXHIBIT F

FOEMULA FOR CALCULATING MONETARY ASSESSMENT
FOR EXCEEDANCE OF
NUMERICAL NITROGEN AND/OR PHOSPHORUS CONCENTRATIONS

Grantee: Town of Cape Charles
Grant: #440-S-09-15

Section 1: Nitrogen Exceedances

CN = (TNeTNt) x AnPay x PerGrant

where:

CN = Assessment for Nitrogen Exceedance.
TNe = Exceedence is tenths of a milligram per liter.
TNt = Expected nitrogen removal (difference between "pre-nutrient removal" annual average concentration and 4.0 mg/l limitation) is tenths of a milligram per liter.
AnPay = Annual Payment on grant; assumes principal payments amortized over 20 years and an interest rate of 5 percent. Using these assumed values leads to a "cost recovery factor" of 0.0802. The "cost recovery factor" times the grant amount yields the Annual Payment amount
PerGrant = Percentage of grant received by year of exceedance.

Values used for Grant #440-S-09-15:

Pre-Nutrient Removal TN Concentration = 11.8 mg/l
Effluent TN Concentration Limitation = 4.0 mg/l
Total Amount of Grant for TN Removal = $4,239,536
Useful Service Life = 20 years
Interest Rate = 5 percent

Calculated (assumes grant paid 100%):
Expected Removal (TNt) = 7.8 mg/l
AnPay = $340,400
CN = $4,360 for each 0.1 mg/l TN exceedance

Waste Water Nutrients

- Phosphorus (P)
- Plant designed to remove P down to .3 mg/l
- Limit .3 mg/l
- $24,140 for each 0.1 mg/l exceedance

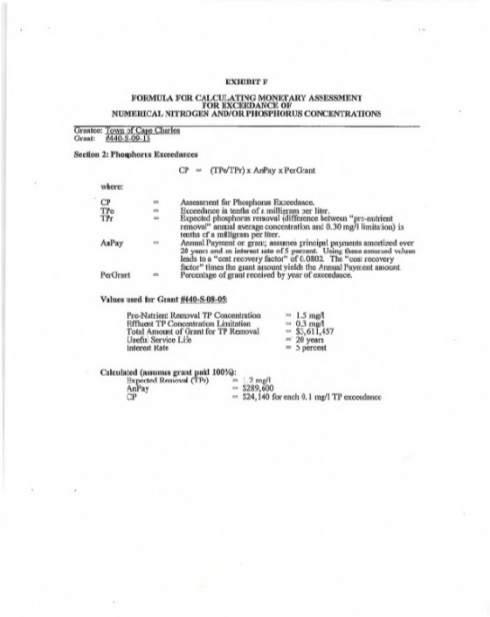


EXHIBIT F

FORMULA FOR CALCULATING MONETARY ASSESSMENT
FOR EXCEEDANCE OF
NUMERICAL NITROGEN AND/OR PHOSPHORUS CONCENTRATIONS

Grantee: Town of Cape Charles
Grant: #440-S-00-11

Section 2: Phosphorus Exceedances

CP = (TPe/TPr) x AnPay x PerGrant

where:

CP	=	Assessment for Phosphorus Exceedance.
TPe	=	Exceedance in tenths of a milligram per liter.
TPr	=	Expected phosphorus removal (difference between "pre-nutrient removal" annual average concentration and 0.30 mg/l limitation) in tenths of a milligram per liter.
AnPay	=	Annual Payment or grant; assumes principal payments amortized over 20 years and an interest rate of 5 percent. Using those assumed values leads to a "cost recovery factor" of 0.0802. The "cost recovery factor" times the grant amount yields the Annual Payment amount
PerGrant	=	Percentage of grant received by year of exceedance.

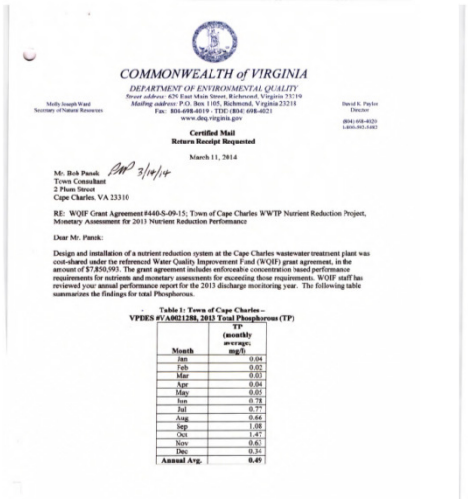
Values used for Grant #440-S-08-05

Pre-Nutrient Removal TP Concentration	=	1.5 mg/l
Effluent TP Concentration Limitation	=	0.3 mg/l
Total Amount of Grant for TP Removal	=	$3,611,457
Useful Service Life	=	20 years
Interest Rate	=	5 percent

Calculated (assumes grant paid 100%):

Expected Removal (TPr)	=	7 mg/l
AnPay	=	$289,600
CP	=	$24,140 for each 0.1 mg/l TP exceedance

Nutrients
Monetary Assessments 2013



COMMONWEALTH of VIRGINIA
DEPARTMENT OF ENVIRONMENTAL QUALITY

Certified Mail
Return Receipt Requested

March 11, 2014

Mr. Bob Panek
Town Consultant
2 Plum Street
Cape Charles, VA 23310

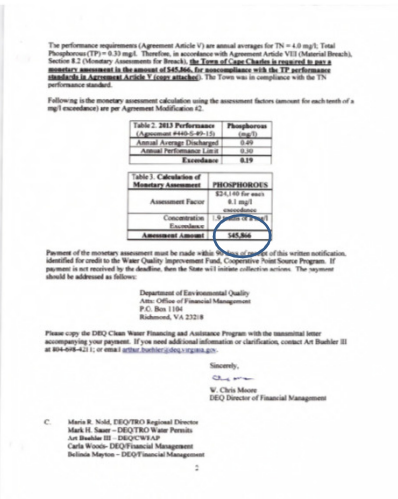
RE: WQIF Grant Agreement #440-S-09-15; Town of Cape Charles WWTP Nutrient Reduction Project, Monetary Assessment for 2013 Nutrient Reduction Performance

Dear Mr. Panek:

Design and installation of a nutrient reduction system at the Cape Charles wastewater treatment plant was cost-shared under the referenced Water Quality Improvement Fund (WQIF) grant agreement, in the amount of $7,850,593. The grant agreement includes enforceable concentration based performance requirements for nutrients and monetary assessment for exceeding those requirements. WQIF staff has reviewed your annual performance report for the 2013 discharge monitoring year. The following table summarizes the findings for total Phosphorous.

Table 1: Town of Cape Charles – VPDES #VA0021288, 2013 Total Phosphorous (TP)

Month	TP (monthly average; mg/l)
Jan	0.04
Feb	0.02
Mar	0.03
Apr	0.04
May	0.05
Jun	0.78
Jul	0.77
Aug	0.64
Sep	1.08
Oct	1.47
Nov	0.61
Dec	0.34
Annual Avg.	**0.49**



The performance requirements (Agreement Article V) are annual averages for TN = 4.0 mg/l; Total Phosphorous (TP) = 0.30 mg/l. Therefore, in accordance with Agreement Article VIII (Material Breach), Section 8.2 (Monetary Assessments for Breach), **the Town of Cape Charles is required to pay a monetary assessment in the amount of $45,866, for noncompliance with the TP performance standards in Agreement Article V (copy attached)**. The Town was in compliance with the TN performance standard.

Following is the monetary assessment calculation using the assessment factors (amount for each tenth of a mg/l exceedance) are per Agreement Modification #2.

Table 2. 2013 Performance (Agreement #440-S-09-15)	Phosphorous (mg/l)
Annual Average Discharged	0.49
Annual Performance Limit	0.30
Exceedance	**0.19**

Table 3. Calculation of Monetary Assessment	PHOSPHOROUS
Assessment Factor	$24,140 for each 0.1 mg/l exceedance
Concentration Exceedance	1.9 tenths of a mg/l
Assessment Amount	**$45,866**

Payment of the monetary assessment must be made within 90 days of the date of this written notification, identified for credit to the Water Quality Improvement Fund, Cooperative Point Source Program. If payment is not received by the deadline, then the State will initiate collection actions. The payment should be addressed as follows:

Department of Environmental Quality
Attn: Office of Financial Management
P.O. Box 1104
Richmond, VA 2321 8

Please copy the DEQ Clean Water Financing and Assistance Program with the transmittal letter accompanying your payment. If you need additional information or clarification, contact Art Buehler III at 804-698-4211; or email arthur.buehler@deq.virginia.gov.

Sincerely,

W. Chris Moore
DEQ Director of Financial Management

C: Maria R. Nold, DEQ/TRO Regional Director
Mark H. Sauer – DEQ/TRO Water Permits
Art Buehler III – DEQ/CWFAP
Carla Woods- DEQ/Financial Management
Belinda Mayton – DEQ/Financial Management

Nutrients
Monetary Assessments
2015

- Estimated assessment for 2015
- .57mg/l - .3mg/l = .27mg/l
- 2.7 x $24,140 = $65,178.00
- Total Assessments :
  - 2013 $45,866
  - 2014 $ 4,828
  - 2015 $65,178
  - Total $115,872

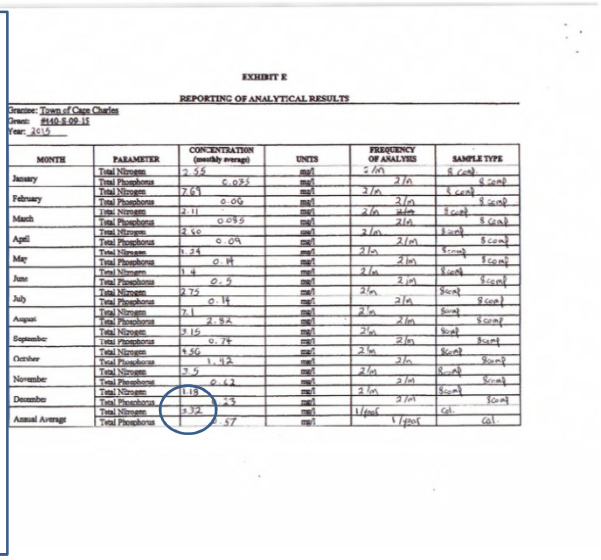


EXHIBIT E

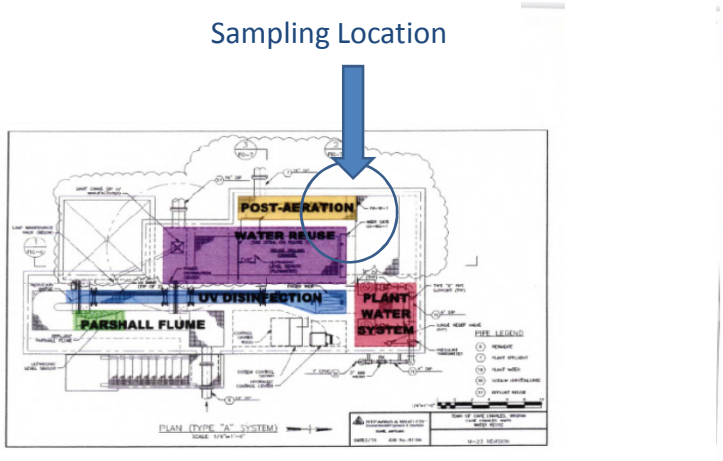
REPORTING OF ANALYTICAL RESULTS

Practice: Town of Cape Charles
Permit: #VA0-S-09-15
Year: 2015

MONTH	PARAMETER	CONCENTRATION (monthly average)	UNITS	FREQUENCY OF ANALYSIS	SAMPLE TYPE
January	Total Nitrogen	2.95	mg/l	2/m	8 comp
	Total Phosphorus	0.035	mg/l	2/m	8 comp
February	Total Nitrogen	7.69	mg/l	2/m	8 comp
	Total Phosphorus	0.06	mg/l	2/m	8 comp
March	Total Nitrogen	2.11	mg/l	2/m	8 comp
	Total Phosphorus	0.055	mg/l	2/m	8 comp
April	Total Nitrogen	2.50	mg/l	2/m	8 comp
	Total Phosphorus	0.09	mg/l	2/m	8 comp
May	Total Nitrogen	1.29	mg/l	2/m	8 comp
	Total Phosphorus	0.14	mg/l	2/m	8 comp
June	Total Nitrogen	1.4	mg/l	2/m	8 comp
	Total Phosphorus	0.5	mg/l	2/m	8 comp
July	Total Nitrogen	2.75	mg/l	2/m	8 comp
	Total Phosphorus	0.14	mg/l	2/m	8 comp
August	Total Nitrogen	7.1	mg/l	2/m	8 comp
	Total Phosphorus	2.82	mg/l	2/m	8 comp
September	Total Nitrogen	3.15	mg/l	2/m	8 comp
	Total Phosphorus	0.74	mg/l	2/m	8 comp
October	Total Nitrogen	4.56	mg/l	2/m	8 comp
	Total Phosphorus	1.42	mg/l	2/m	8 comp
November	Total Nitrogen	3.5	mg/l	2/m	8 comp
	Total Phosphorus	0.42	mg/l	2/m	8 comp
December	Total Nitrogen	4.18	mg/l	2/m	8 comp
	Total Phosphorus	1.25	mg/l	2/m	8 comp
Annual Average	Total Nitrogen	3.32	mg/l	1/mo	Calc
	Total Phosphorus	0.57	mg/l	1/mo	Calc

Waste Water
Nutrients

Sampling Location

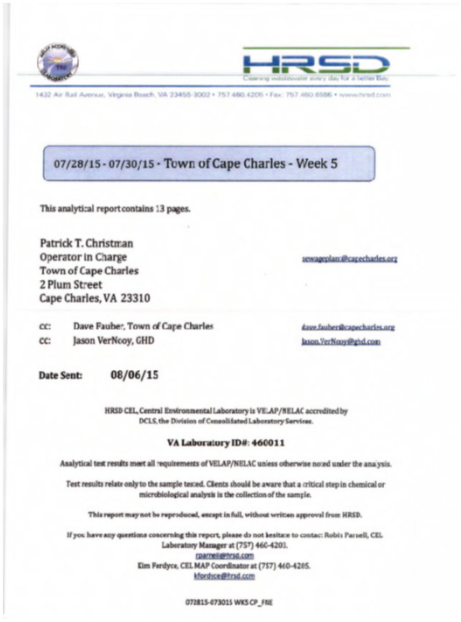


Waste Water Nutrients

Generally there is a 1-2 week turn around for lab work.

3 groups of samples were selected randomly:

Sample Date	Results Rec'd
9/1/215	9/14/15
6/30/15	7/7/15
5/20/15 5/12/15	6/2/15



HRSD

07/28/15 - 07/30/15 - Town of Cape Charles - Week 5

This analytical report contains 13 pages.

Patrick T. Christman
Operator in Charge
Town of Cape Charles
2 Plum Street
Cape Charles, VA 23310

cc: Dave Fauber, Town of Cape Charles
cc: Jason VerNooy, GHD

Date Sent: 08/06/15

HRSD CEL, Central Environmental Laboratory is VELAP/NELAC accredited by DCLS, the Division of Consolidated Laboratory Services.

VA Laboratory ID#: 460011

Analytical test results meet all requirements of VELAP/NELAC unless otherwise noted under the analysis.

Test results relate only to the sample tested. Clients should be aware that a critical step in chemical or microbiological analysis is the collection of the sample.

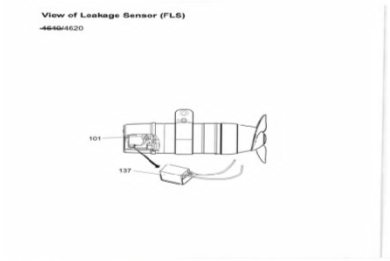
This report may not be reproduced, except in full, without written approval from HRSD.

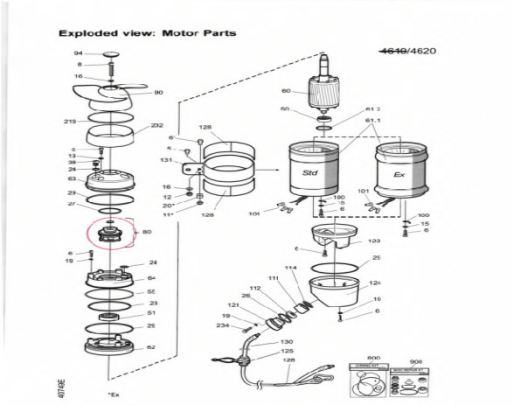
If you have any questions concerning this report, please do not hesitate to contact: Robin Parnell, CEL Laboratory Manager at (757) 460-4201.
Elm Ferdyce, CEL MAP Coordinator at (757) 460-4265.

071815-073015 WKS CP_FRE

Waste Water Mixers

- 12 Mixers Total
- All have been repaired at least twice
- Two Spares
- Purchase 4 More as spares
- Replace mechanical seal annually w/part time help
- Technician from Tencarva on site Feb. 15 to trouble shoot leak sensors





Waste Water Mixers

9/11/13	11/26/13	1119001		
2/15/13	3/27/13	1119002		1508.50
8/5/15	8/21/15	1119002		2916.68
8/5/15	8/21/15	1119003		2388.60
3/13/13	5/22/13	1119004		1050.00
8/5/15	8/21/15	1119004		1936.15
12/19/13	1/28/14	1119006		2032.00
4/18/13		1119007		1808.00
7/31/15	8/21/15	1119007		1916.00
2/15/13	3/26/13	1119008		1612.00
8/5/15	8/21/15	1119008		2054.45
4/18/13		1119009		
3/13/13	5/22/13	1119011		2412.00
3/13/13	5/22/13	1119011		2274.00
4/18/13	6/20/13	1119011		2412.00
4/18/13	5/22/13	1119011		2274.00
12/18/13	1/28/14	1119011		1227.00
8/10/12	10/1/12	1119012		
9/11/13	11/26/13	1119012		
8/5/15	8/21/15	1119012		1936.15
				31757.53