

**Attachment 1A
JOINT MEETING OF
DIRECTORS OF UTILITIES COMMITTEE
DIRECTORS OF HEALTH
REGIONAL EMERGENCY MANAGEMENT TECHNICAL ADVISORY COMMITTEE
June 4, 2014
Chesapeake**

1. Summary of the March 5, 2014 Meeting of the Directors of Utilities Committee

There were no comments on, or revisions to the summary of the March 5, 2014 Committee meeting.

ACTION: The summary of the March 5, 2014 Directors of Utilities Committee meeting was approved.

2. Summary of the April 2, 2014 Meeting of the Directors of Utilities Committee

There were no comments on, or revisions to the summary of the April 2, 2014 Committee meeting.

ACTION: The summary of the April 2, 2014 Directors of Utilities Committee meeting was approved.

3. Summary of December 4, 2013 Joint Meeting of the Directors of Utilities Committee and Directors of Health

There were no comments on, or revisions to the summary of the December 4, 2013 joint meeting.

ACTION: The summary of the December 4, 2013 Joint Meeting of the Directors of Utilities Committee and Directors of Health was approved.

4. Public Comment

There were no public comments.

5. City of Chesapeake Public Utilities and Emergency Management Coordination

Mr. Robb Braidwood, Chesapeake Emergency Management, and Mr. David Jurgens, Chesapeake Public Utilities Director briefed the group on the coordination of the emergency management sector and public utilities sector in the City of Chesapeake and led a discussion of best practices applied by localities:

- Regarding the Incident Command System (ICS), Chesapeake Public Utilities are part of the Operations Section's Infrastructure Branch, which also includes

energy, public works, and transportation. Emergency Management looks to Public Utilities for system status, knowledge of interdependencies, and system functionality. The common operating picture is critical; GIS staff from Public Utilities and from the Emergency Operations Center (EOC) are currently working on a live system status map. The role for utilities is incident specific; utilities are encouraged to interface with the Health Department and maintain an open dialogue with Emergency Management on anticipated needs for the 24-hour, 36-hour, 48-hour time frames.

- The City of Suffolk's Emergency Management and Public Utilities cooperate and share information in ways very similar to the City of Chesapeake. Suffolk's WebEOC includes a map-enabled board that displays pump station status
- The City of Hampton's Emergency Management and Public Works also cooperate in a similar manner. Public Works effectively communicates current and anticipated needs. Public Works provides water system status information from contacts at Newport News Waterworks.
- James City County's Emergency Management and the James City Service Authority (JCSA) also cooperate in a similar manner. JCSA has access to the County's alert system, which can be used to advise the public of water and wastewater system status.

The group also discussed general preparedness planning as summarized below:

- In terms of big-picture planning, Chesapeake is working on making emergency management plans more robust for non-hurricane events. Tornado events that occur with only a few hours notice pose different challenges and may prompt different actions than a hurricane or storm event where preparation begins several days ahead.
- Utilities can have emergencies within the water or wastewater system that can evolve into multi-sector emergencies, for example, freeze-ups. Utilities should educate other sectors on these possibilities and involve them in response planning.
- Utilities should advise Emergency Managers of mitigation needs. Items such as quick connects may be obtained through mitigation grants.
- Infrastructure and utilities are critical to post-event recovery and rebuilding. Emergency Managers need utility input for recovery planning efforts.
- NIMS/ICS is the "language" of the EOC and FEMA. Utilities are encouraged to complete NIMS training, including the twelve classes on infrastructure protection. As more staff completes NIMS 300 and 400 level classes, utilities will have more leadership capabilities in the field. Utilities can notify their Emergency Manager of the number of staff that needs training and Emergency Managers can coordinate to schedule a local training session for multiple utilities.

ACTION: No action.

6. Priorities for Utility Preparedness and Response

The HRPDC staff reviewed priority initiatives for utility preparedness and response from the [Hampton Roads Water and Wastewater Systems Emergency Preparedness and Response Regional Improvement Plan](#) (December 2012). Staff presented two implementation proposals for fiscal year 2015 to address four of the six priority initiatives (see Attachment 1C):

- A. Setup an operations-level working group within the utilities sector with a few representatives from emergency management to identify needs for planning tools, evaluate COOP templates, and examine shelter-in-place needs and options.
- B. Create a board in WebEOC to collect and display water and wastewater utility status information that is typically reported to emergency operations centers; development of the board would be vetted by the operations-level working group and the Regional Emergency Management Technical Advisory Committee.

The Committee did not take action on either proposal. The discussion is summarized below:

- The Ready Hampton Roads website library could be used for information sharing and to support planning tools, checklists, and templates. A secure section for utility working files can be set up to support collaboration.
- The infrastructure board could be modified to add pump station status.
- If there is interest in using a regional WebEOC board for utilities, Emergency Managers would like to know if utilities would commit to using such a resource. Use policies are currently being developed.
- Given the rapidly changing status of facilities during and after an event, it will be difficult to constantly update the utility board to keep it accurate.
- The need for a common operating picture for water utilities is driven primarily by the state's desire for a water service map similar to Dominion Power's outage map; the creation of such a map is not realistic.
- To provide twice daily status updates to the state EOC, the VDH Office of Drinking Water contacts utilities by phone. Many larger utilities already provide status updates to their local EOC, which push the information up to the state EOC.
- Another way to assess the status of small private systems would be to compare Dominion's power outage map to private water service areas.

ACTION: No action.

7. Regional Hazard Mitigation Planning

Ms. Erin Sutton, Virginia Beach Office of Emergency Management, and Mr. George Glazner, Newport News Emergency Management Division, briefed the group on the four-year update of the Regional Hazard Mitigation Plan. July's project kick-off efforts will include the formation of an executive committee and a larger group of partners. Utilities are encouraged to participate.

It was also noted that utilities should coordinate with emergency managers to ensure that locality hazard mitigation plan updates include utility projects. Only projects included in mitigation plans are eligible for post-event funding assistance.

ACTION: No action.

8. Beach Monitoring: 2013 qPCR Demonstration Project in Virginia Beach and 2013 Microbial Source Tracking in Newport News

Mr. Matthew Skiljo, Virginia Department of Health (VDH) Waterborne Pathogens Control Program Coordinator, provided a briefing on the [2013 Beach Monitoring qPCR Demonstration Project](#), which involved project partners HRSD and the City of Virginia Beach. The project, funded by a grant from the EPA, evaluated a new method for the analysis of enterococci bacteria in saltwater. A copy of his presentation is provided as Attachment 1D. The presentation and discussion is summarized below:

- Mr. Skiljo explained existing beach monitoring methods and EPA's recommendation for states to evaluate the performance of the new quantitative polymerase chain reaction (qPCR) method that quantifies bacterial DNA. After reviewing the objectives and monitoring plan for the demonstration project in Virginia Beach, Mr. Skiljo highlighted key results, explaining that although qPCR testing results can be reported faster than the current method, the EPA's recommended standard for qPCR is not appropriate for determining beach advisories in Virginia Beach and more research is needed to evaluate the method and alternatives. VDH is interested in conducting further studies, but funding sources need to be secured.
- During the discussion, it was noted that two sampling locations on the Atlantic Ocean frequently produced inhibited samples. Inhibited sample results are not representative of the bacteria in the water and cannot be used to determine if water quality standards are exceeded. qPCR may not be appropriate for these two sampling locations. Turbidity can contribute to inhibition frequency by preventing some of the DNA from replicating. Some acids in total dissolved solids can also impact replication. Beach sampling must occur in the morning, so sampling cannot be scheduled for less turbulent, low-tide conditions. Also, UV light degrades bacteria, creating different water quality conditions later in the day.

Mr. Stephen Land, Newport News Public Works Administrator, presented a summary of cooperative efforts by the City of Newport News, HRSD, VDH, and Virginia Tech to investigate high bacteria levels at Hilton Beach and the City's follow-up actions. A copy of his presentation is provided as Attachment 1E. The presentation and discussion is summarized below:

- Mr. Land reviewed the extensive investigative efforts to identify the bacteria source impacting Hilton Beach. Initial water sampling and smoke testing of the wastewater collection system was followed by multi-departmental coordination to take additional water samples, conduct extensive smoke testing and CCTV work, and find and fix any defects in the sewer and stormwater collection systems. Potential source areas were identified, but no “smoking gun” was found. Water quality testing showed significant variations in bacterial levels throughout the analysis period. The City’s Stormwater and Wastewater divisions are working on multiple projects to repair and rehabilitate collection lines to eliminate potential sources and to ensure the health and safety of area residents.
- During the discussion, it was noted that testing showed inconsistent levels of bacteria of human origin. Stormwater runoff from roof drains can contain bacteria at similar levels those found at Hilton Beach. Samples from stormwater outfalls upriver near Huntington Beach tested negative for bacteria. Newport News Public Works continues to actively investigate the problem. It will be interesting to compare stormwater outfall sample test results to weekly beach sample results collected by the Peninsula Health District.

ACTION: Per discussion.

9. Source Water Protection Program

Mr. Brent Waters, Golder Associates Inc., briefed the group on VDH’s efforts to assist small communities in the development of Source Water Protection Programs (SWPPs), including VDH’s community-based planning approach and available technical assistance (see Attachment 1F). VDH, with grant funding from the EPA, has retained Golder Associates Inc. to provide technical expertise, facilitate utility and stakeholder input, and to develop plans.

Mr. Waters provided a brief history of the program and noted that since 2002, VDH has funded SWPPs primarily for groundwater systems that serve up to 10,000 people in rural areas; VDH is beginning to extend the program to surface water systems. This effort builds on the risks identified in the VDH Source Water Assessments and identifies mechanisms to minimize existing risks and future threats, such as land use and salt water intrusion.

During the discussion, it was noted that VDH encourages the development of SWPPs, but such programs are not mandated. In Hampton Roads, communities of 10,000 people or less are eligible for SWPP assistance.

ACTION: No action.

10. Regulatory Update

Mr. Dan Horne, Virginia Department of Health (VDH), Office of Drinking Water (ODW), provided an update on regulatory issues. A copy of Mr. Horne's summary is provided as Attachment 1G.

VDH staff is working with the VDH Waterworks Advisory Committee to develop proposed revisions to the Waterworks Regulations. Following internal review, VDH will convene a regulatory advisory panel (RAP). Mr. Horne requested that Committee members send him nominees for RAP participants.

EPA has completed training for states on the Revised Total Coliform Rule and has provided draft guidance documents. VDH is developing an implementation strategy and draft regulations and is planning to provide training for waterworks in partnership with Virginia Rural Water and the American Water Works Association.

Regarding the Long Term 2 Enhanced Surface Water Treatment Rule for control of microbial pathogens, VDH has provided notice of round 2 source water monitoring requirements to Schedule 1 systems. Mr. Horne encouraged utilities to confirm a lab service provider quickly and noted that only two labs are currently included on the DCLS list of approved labs for round 2 *Cryptosporidium* monitoring. Although the EPA is encouraging the use of the new testing method 1623.1, methods 1622 and 1623 are also acceptable to VDH. None of these methods distinguish between live and dead cysts.

ACTION: No action.

11. Roundtable Discussion

There were no items for the roundtable discussion.

12. H2O - Help to Others - Program

Mr. Randy Keaton, HRPDC Deputy Director, provided a briefing on the reinstatement of non-profit status for the H2O – Help to Others – Program and reviewed IRS Form 990. The Committee, which serves as the H2O Board of Directors, authorized the submittal of necessary tax forms for 2011, 2012, and 2013.

ACTION: The submittal of IRS Form 990 for 2011, 2012, and 2013 was authorized.

13. Regional Sanitary Sewer System Asset Consolidation

The Committee discussed the next steps related to the Consent Decree (CD) and Special Order by Consent (SOC). The modification of the federal CD, lodged in federal district court on May 30, 2014, describes the "hybrid" approach and HRSD's responsibility for capacity in the regional sanitary sewer system. DEQ is currently preparing a modification of the SOC.

ACTION: No action.

14. Staff Reports

- **Hampton Roads Water Quality Response Plan:** The annual update of the Emergency Contact list for the Hampton Roads Water Quality Response Plan is underway. The 2014 update will be distributed upon completion.

ACTION: No action.

15. Other Business

There was no discussion of other business.

Committee Meeting Sign-In Sheet
June 4, 2014

Attachment 1B

Locality/Agency	Representative	Representative	Representative	Representative
HRSD	Ted Henifin	Danny Barker		
Chesapeake	David Jurgens			
Franklin				
Gloucester	Arnie Francis			
Hampton	Jason Mitchell			
Isle of Wight				
James City County				
Newport News	Steve Land			
Newport News	Joyce Heffington			
Newport News	Dave Morris			
Norfolk	Kristen Lentz			
Poquoson	Bob Speechley			
Portsmouth	Erin Trimyer			
Smithfield				
Southampton				
Suffolk	Craig Ziesemer			
Surry				
Virginia Beach	Tom Leahy			
Williamsburg				
Windsor				
York	Brian Woodward			
HRPDC	Whitney Katchmark	Curtis Brown	Dawn Brantley	Tiffany Smith
HRPDC	Randy Keaton	Jennifer Tribo		
New Kent				
DEQ				
EPA				
USGS				
VDH	Harry Bennett	Jay Duell	Steve Puckett	
VDH	Nancy Welch	Billie Blair-Taylor	Amy Pemberton	
VDH	Dan Horne	Matthew Skiljo		
Emergency Managers	George Glazner	Kate Hale, JC	Jim Judkins, SU	Creig Moore
Emergency Managers	Wallace Twigg	Spence Campbell	Judy Cooling	
Emergency Managers	Robb Braidwood, CH	Sara Ruch, HA	Erin Sutton	
AECOM				
AquaLaw				
Brown & Caldwell				
CH2M-Hill				
Christian Barton				
Golder Associates	Brent Waters			
HDR				
Hurt & Proffitt, Inc.				
McGuire Woods				
Rice Associates				
REMSA				
Troutman Sanders				
Virginia Fusion Center				
Virginia WARN				
URS	Mike Barbachem			
Whitman, Requardt & Assoc.	Bruce Schweneker			
Private citizens				

Priorities for Utility Preparedness and Response

Whitney S. Katchmark, P.E.
Principal Water Resources Engineer

Directors of Utilities Committee
June 4, 2014



Next Steps: Implementation of Priorities

Hampton Roads Water and Wastewater Systems Emergency Preparedness and Response Regional Improvement Plan identified 6 high priority initiatives.

1A – Planning Toolbox

1D – Continuity of Operations Planning

2A – Enhance Shelter-in-Place Capability

3A – Inter-utility “Common Operating Picture”

3B – Networking with Key Disaster Response Partners

5a – Infrastructure Grant Funding



1st Proposal: Setup Working Group

Proposal: Setup an operations level working group within the utilities sector with a few representatives from emergency management.

Objectives:

- *Create specific list of needs for the “planning toolbox”*
- *Evaluate existing COOP templates and potential need for consultant support.*
- *Consider needs and options for Sheltering-in-Place.*

1 A – Planning Toolbox

1 D – Continuity of Operations Planning

2 A – Enhance Shelter-in-Place Capability



3

2nd Proposal: Create WebEOC Utility Board

Proposal: Create a board in WebEOC to collect and display information related to water and wastewater utilities.

Process:

- *Identify data that is typically requested*
- *HRPDC draft WebEOC board format*
- *Review with Utilities and Emergency Managers*

3 A – Inter-utility “Common Operating Picture”



4

Proposed Action

- 1. Setup an operations level working group within the utilities sector with a few representatives from emergency management.***
- 2. Create a board in WebEOC to collect and display information related to water and wastewater utilities.***



qPCR Performance/Demonstration Project for Beach Monitoring

Virginia Beach, VA
May - September 2013

Matt Skiljo
Waterborne Hazards Control Coordinator
VDH, Division of Environmental Epidemiology

Beach Monitoring Methods

Background

- Monitor beach water for fecal pollution and notify the public (beach/water users) of health risks, to prevent recreational water illnesses.
- Samples analyzed for Fecal Indicator Bacteria (FIB)
- Virginia's Water Quality Standards (WQS):
 - Enterococci - Marine waters (104 cfu/100ml)
- EPA's 1986 Recreational Water Quality Criteria (RWQC)
 - Established relationships between FIB densities and swimming associated health effects (RWIs).
- EPA's 2012 RWQC
 - New epi studies, new methods, & others

Beach Monitoring Methods

Background

Culture:

- Current method used in Virginia Beach
- Results available 24 hours after analysis
- Results = living enterococci cells



Molecular:

- New EPA Method, recommended to states
- Results available 2-4 hours after analysis
- Results = living and dead enterococci cells



EPA - qPCR Recommendations

Background

- qPCR method was recommended in EPA's 2012 Recreational Water Quality Criteria (RWQC)
- States must evaluate the performance of the method before implementing full time and including in State Water Quality Standards
- EPA 2012 RWQC provide recommended standard values for qPCR methods

Method	Enterolert		qPCR	
	Illness Rate	36/1000	32/1000	36/1000
Standard	130 cfu	110 cfu	2,000 CCE	1,280 CCE



qPCR Project Objectives

Background

- Evaluate Laboratory Performance of Enterococci qPCR Methods (EPA Method 1611) of beach water samples.
 - Accuracy
 - Precision
 - Interference/Inhibition

- Evaluate Logistics of Beach Monitoring using qPCR
 - Sample collection
 - Laboratory analysis & reporting
 - Issuing beach closures
 - Lifting beach closures

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qPCR Project Plan

Background

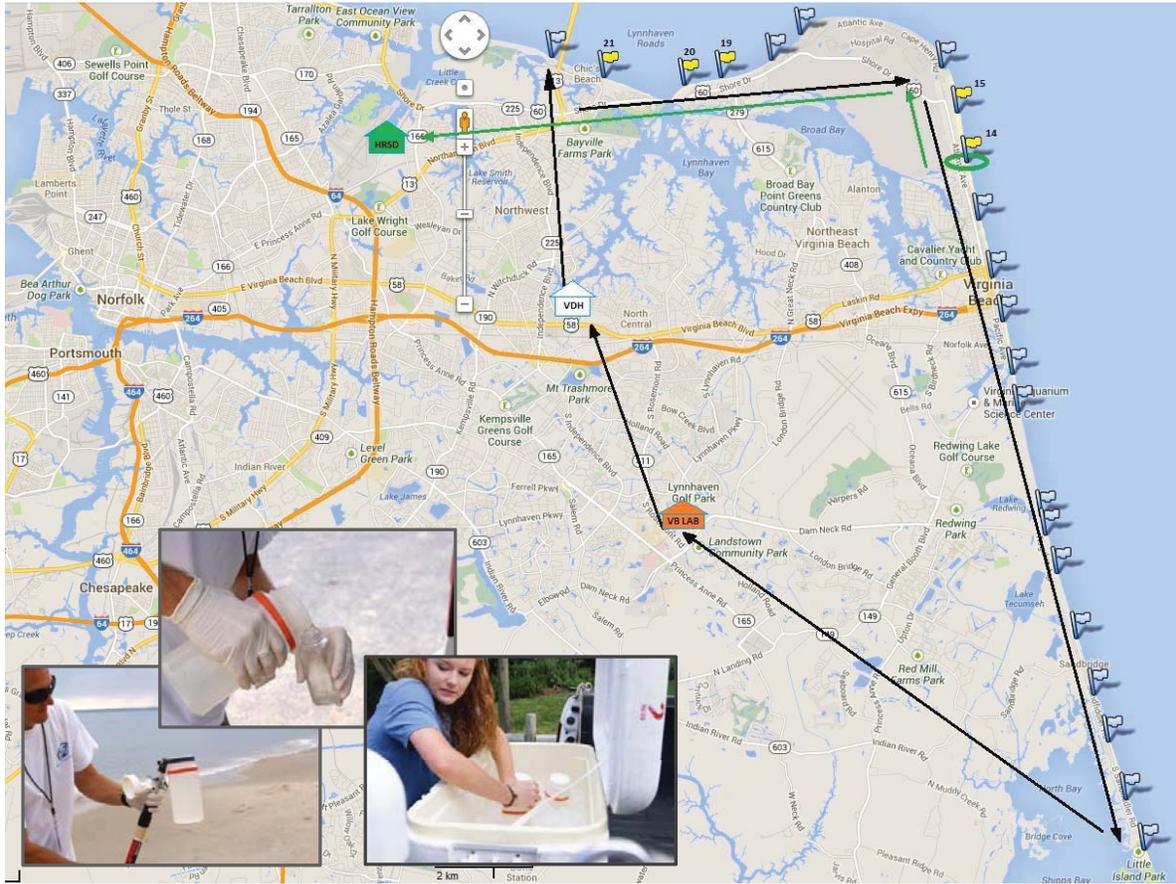
• Five Monitoring Locations

- 63rd Street Beach (Site 14)
 - 78th Street Beach (Site 15)
 - Sea Gate Beach (Site 19)
 - Lesner Bridge East Beach (Site 20)
 - Chesapeake Beach (Site 21)
- Atlantic Ocean
 Chesapeake Bay



- Water samples collected weekly at each location
- Samples picked up by HRSD staff at last project site (14)
- Each sample analyzed for both qPCR and Enterolert
- Enterolert at VB Lab and qPCR at HRSD Lab
- Two qPCR machines used for qPCR analysis:
 - Step One Plus (ABI) and Cepheid Smart Cycler (SC)

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qPCR Key Results

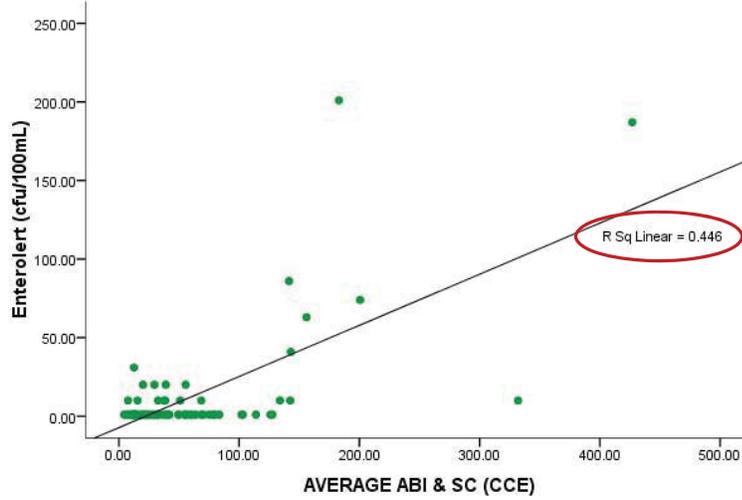
Background

- Relationship of qPCR results vs. Enterolert results
- Inhibition: Frequency and Quantity
- Relationship of qPCR Closures vs. Enterolert Closures
- Laboratory Performance
- Logistics
 - Sample Collection
 - Sample Pick-up & Transport
 - Analysis time
 - Reporting time

Enterolert vs. qPCR

Relationship
qPCR & Enterolert

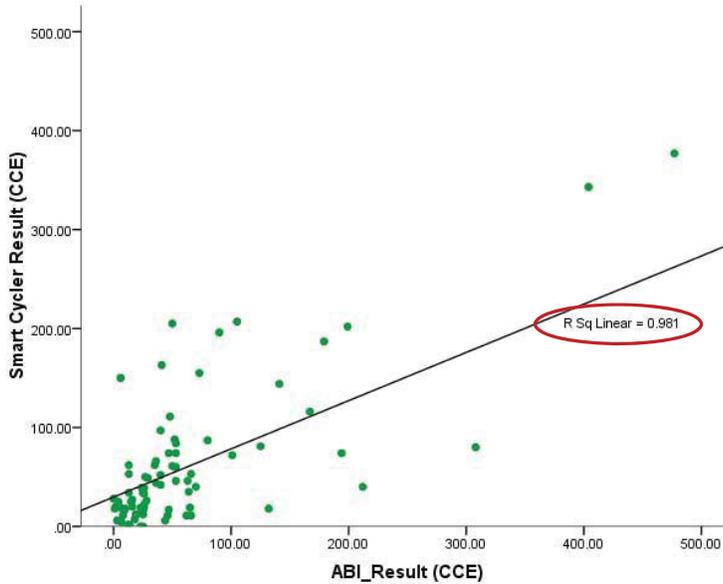
Average (ABI CCE & SC CCE) vs. Enterolert



ABI vs. Smart Cycler

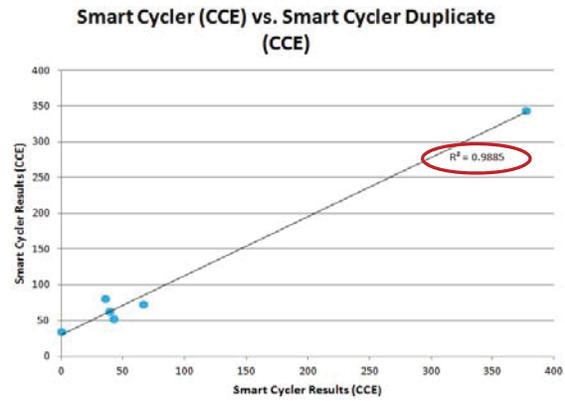
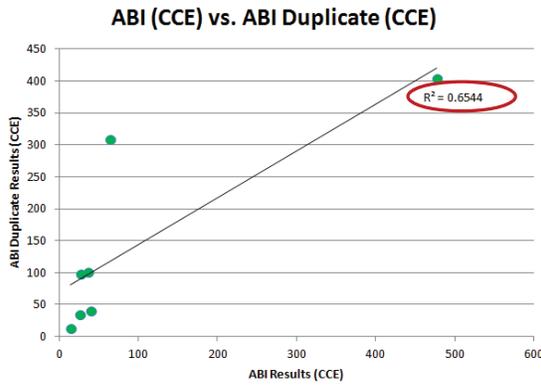
Relationship
ABI vs. SC

Association between ABI and Smart Cycler qPCR Results (CCE)



ABI and SC Duplicates (CCE)

Relationship
qPCR Duplicates



Inhibition Frequency

Inhibition

- qPCR threshold cycle (C_t) values $>3.0 C_t$ = Inhibited
- Inhibited samples cannot be used to determine exceedances
- n = 98 samples*

Beach Name	# Samples Inhibited	# Site Samples	% of samples
Chesapeake Beach (21)	2	19	10%
Lesner Bridge East Beach (20)	2	21	10%
Sea Gate Beach (19)	2	20	10%
78 th Street Beach (15)	7	19	37%
63 rd Street Beach (14)	5	19	26%
TOTAL	18	98	18%

* 8 duplicate qPCR samples were removed because there were no associated Enterolert results.



Sample Exceedances

Sample Exceedances

- Enterolert exceedances w/ corresponding qPCR results

Beach Name	Date	Enterolert (cfu/100ml)	Closure?	qPCR (CCE)	Closure?
Lesner Bridge East Beach (20)	6/11/13	187	Yes	412 (447, 377)	No
63 rd Street Beach (14)	7/9/13	169	Yes	183 (179, 187)	No
Lesner Bridge East Beach (20)	9/17/13	201	Yes	102 (*, 102)	No

- qPCR exceedances w/ corresponding Enterolert results

Beach Name	Date	Enterolert (cfu/100ml)	Closure?	qPCR (CCE)	Closure?
Lesner Bridge East Beach (20)	7/23/13	41	No	5310 (7120, 3500)	Yes

qPCR CCE results: Avg. Result (ABI, SC)



Would the Same Beach Closures be Issued?

Relationship Beach Closures

		Enterolert	
		Post	No Post
qPCR (CCE) Smart Cycler	Post	0 (0%)	1 (1%)
	No Post	3 (4%)	76 (95%)

n=80 samples. 18 were inhibited (>3.0 Ct) and therefore were not taken into account.

		Enterolert	
		Post	No Post
qPCR (CCE) ABI	Post	0 (0%)	1 (1%)
	No Post	2* (3%)	77 (96%)

n=80 samples. 18 were inhibited (>3.0 Ct) and therefore were not taken into account.

* One qPCR sample was inhibited when the Enterolert result caused a posting, therefore it was not included in the table (bottom left quadrant).



Laboratory Performance (HRSD)

Quality Control

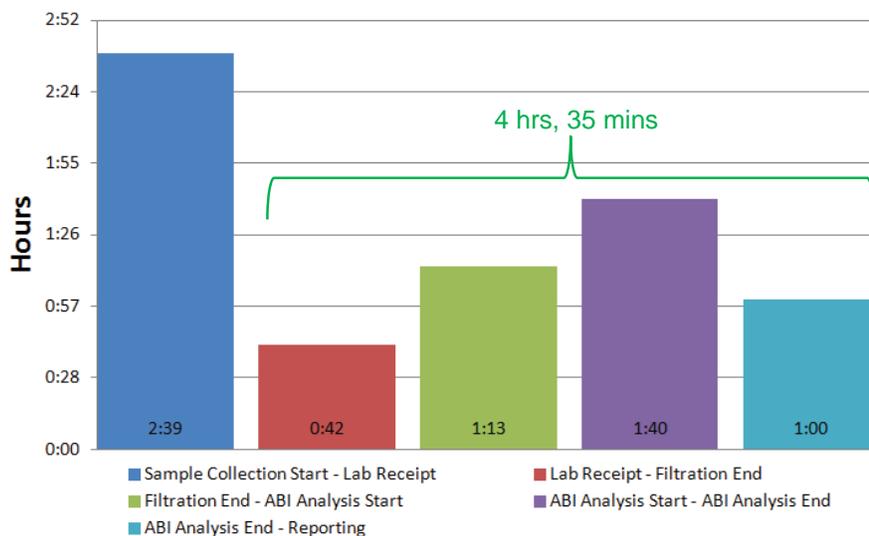
- **No Template Control (NTC):** Ensure Master Mix reagents are not contaminated.
 - All results within acceptable range: Single rxn <35 Ct, or <1/3 below 45 Ct
- **Method Blank (MB):** Water Sample Filtration Blank
 - All results showed minimal to no growth.
- **Initial Precision and Recovery (IPR):** Performed by each analyst and demonstrates acceptable method performance.
 - All analysts (3) met recovery requirements (detect - 286%)
- **Ongoing Precision and Recovery (OPR):** Performed each week samples are analyzed to demonstrate ongoing control.
 - All OPR results met recovery requirements (detect - 325%)
- **Matrix Spike (MS):** Performed each week to determine affect of particular matrix (water) on recoveries.
 - All MS results met recovery requirements (detect - 1123%), except one sample that was inhibited (Site 15 on 8/13/13).



Category Time Duration

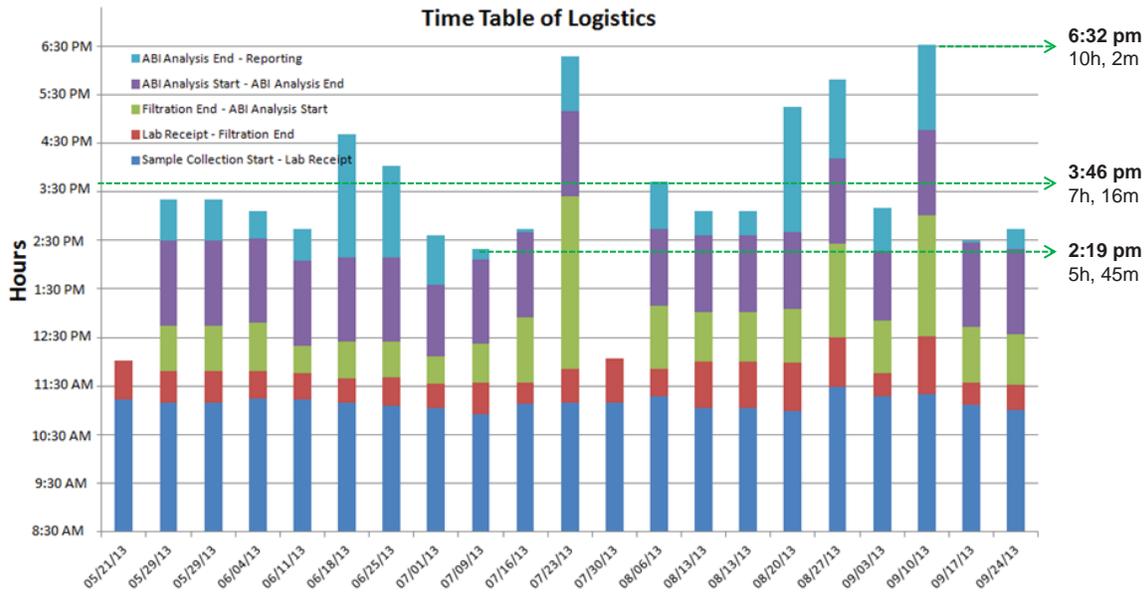
Logistics

Average Time During Each Step



Weekly Time Duration - 5 Sites

Logistics



Conclusions / Next Steps

1. Project results do not currently demonstrate that qPCR can be efficiently used in Virginia Beach in 2014 using EPA recommended standard for qPCR.
2. Relationship of qPCR and Enterolert exists in Virginia Beach waters. However, additional data is necessary to determine the specific relationship/model and appropriate CCE value for a standard, so ratio of beach closures for qPCR and Enterolert will be approximately 1:1.
3. Alternatives would need to be developed to provide beach decisions when samples are inhibited, since 18% of samples were inhibited. If not, qPCR may not be appropriate for the two ocean sites (14 & 15).
4. Additional qPCR projects need to be conducted to further evaluate the method.

Items to consider for future projects:

 - a) Duplicate Enterolert samples should be collected and analyzed if a future project is pursued for additional quality control.
 - b) More samples should be collected to acquire a larger data set and more samples should be collected when samples are expected to be elevated.
 - c) Identify and consider methods that may reduce sample inhibition.
 - d) EPA funding for a 2014 project is not available. If a 2014 qPCR evaluation project is pursued, a funding source would need to be established.



Acknowledgements

VDH:
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HRSD:
Danny Barker
Robin Parnell
Tiffany Elston

UNC – Inst. Of Marine Science:
Rachel Noble
Denene Blackwood

SCCWRP:
John Griffith



Questions?



HILTON BEACH ANALYSIS – PHASE II



Hilton Beach Phase I



- Used a water sampling method that worked in the past to get results, but it didn't give us results that were useful
- Some smoke testing work and extensive water samples in response to beach testing results
- A few problems were discovered and addressed.
- But we didn't find a silver bullet

Hilton Beach Phase II



- More in depth investigation
- Wastewater, Stormwater, Asset Management, Engineering, and HRSD agreed to coordinate all efforts of both the Storm and Sanitary Systems to find and eliminate the cause of the Hilton Beach contamination
- HRSD is replacing the Force Main and Pump Station at Center Ave

Hilton Beach Phase II



- Analysis team agreed to a four pronged approach
 - Wastewater to smoke test the entire area and begin new series of water samples
 - Stormwater and Wastewater will CCTV all mains in the analysis area
 - Take additional 3-4 water “grabs” to send to the lab for testing of any fecal contamination just to ensure that when it does rain a possible contamination source may still exist in the aged stormwater line behind Stratford and James River Dr.
 - Find and Fix any defects found

Hilton Beach Phase II



Additional Work by Wastewater:

- Additional Smoke Testing and CCTV Work outside of the original project boundaries was completed in the North Hilton Section of the City.

Hilton Beach Phase II



Sampling

Week of March 31, 2014

From Near Warwick Blvd towards River Rd
 Site #1: E. Coli: 73, Enterococcus: 199 MPN/100mL
 Site #2: E. Coli: 195, Enterococcus: 1920 MPN/100mL
 Site #3: E. Coli: 31, Enterococcus: 220 MPN/100mL
 Site #4: E. Coli: 243, Enterococcus: 243 MPN/100mL
 Site #5: E. Coli: <10, Enterococcus: <10 MPN/100mL

VDH Sample 5/20/14	Sample Time	Enterococci #/100mL
<u>Sample Description</u>		
Yorktown Beach	10:25 AM	10/<10
Huntington Beach	8:30 AM	120/96
Hilton Beach	7:52 AM	313/383
Hilton Beach #4	8:20 AM	591/620
Hilton Beach #6	8:10 AM	399/226
King-Lincoln Park	8:50 AM	30/<10
Anderson Beach	9:20 AM	<10/<10

Week of April 28, 2014

Site #1: E. Coli: 63, Enterococcus: 63 MPN/100mL
 Site #2: E. Coli: 749, Enterococcus: 3450 MPN/100mL
 Site #3: E. Coli: 161, Enterococcus: 63 MPN/100mL
 Site #7: E. Coli: 74, Enterococcus: 504 MPN/100mL
 Site #8: E. Coli: 92, Enterococcus: 2480 MPN/100mL
 Site #9: E. Coli: 959, Enterococcus: 809 MPN/100mL
 Site #10: E. Coli: 571, Enterococcus: 216 MPN/100mL

VDH Sample 5/21/14 (follow-up sample)	Sample Time	Enterococci #/100mL
<u>Sample Description</u>		
Yorktown Beach		
Huntington Beach	10:05 AM	10/135
Hilton Beach	9:30 AM	292/241
Hilton Beach #4	9:50 AM	336/379
Hilton Beach #6	9:40 AM	369/355
King-Lincoln Park		
Anderson Beach		

VDH Sample 5/28/14	Sample Time	Enterococci #/100mL
<u>Sample Description</u>		
Yorktown Beach		
Huntington Beach		
Hilton Beach	11:00 AM	20/<10
Hilton Beach #4	11:08 AM	10/10
Hilton Beach #6	11:14 AM	20/20
King-Lincoln Park		
Anderson Beach		

Hilton Beach Phase II



- Results – Stormwater will execute (some of the rehab/repair work in house, the rest by contractor):
- 3800 lf of aged Terra-Cotta lines in poor to bad condition from N. Hilton alley way section behind Hammond St down between Milford Rd and Post St to River Rd. Project to be done in 2 Phases. Phase I: North Hilton to be done with in-house crews; Projected Start: June-July 2014. Phase II: Original Hilton Village to be done by contractor at this time. In design with Engineering then out for bid. Projected Start: Fall 2014 (earliest)
- Brandon Heights Drainage Project: Two Phases. Phase I: 900 lf of aged & deteriorated pipe composes Phase I. Bids out Mid to late May 2014 (app.) Phase II: 3,150 lf of bad, cracked pipe composes Phase II of Brandon Heights. Projected Start of Phase II: earliest is Fall 2014.

Hilton Beach Phase II



- Results – Wastewater will execute repairs as we find them to include all of Milford and Stratford Rd as replacement projects.
- Two Stormwater Cross Connections to be completed during Stratford and Milford Rd replacement projects. Projected Start date for Stratford Rd is Early to Mid June 2014; Milford Rd is in Mid-August 2014.
- Three leaking manholes (2 repaired) third to be done during Stratford Rd project; Projected Start: Mid-June 2014
- Stratford Rd Mainline/laterals/MH Replacement Project, aged, cracked pipe with slipped joints, storm connections, and leaking groundwater MHs. Projected Start: Early to Mid June 2014 (app.)

Hilton Beach Phase II



- Milford Rd Mainline/laterals/MH Replacement Project, multiple sections of Milford from Hurley to app. 300 lf past Ferguson Ave. Jacked Laterals, bad bellies, 6" to 8" back to 6" pipe segments, poor to bad joints, storm cross connection. Projected Start: Mid-August 2014 (app.)
- Mainline Pipe section of Ferguson Ave from Intersection of Ferguson and Brandon for app. 300 lf towards Milford Rd – bad joints throughout. To be completed in conjunction with the Milford Rd project. Projected Start: Mid-October 2014 (app.)
- Mainline Pipe, multiple pipe sections from Post St to HRSD MH connection behind Hilton Elementary School. SS line is in drainage way. CIP project bids are getting ready to go out. Contract expected to be awarded in August.

QUESTIONS ?

Source Water Protection Plan Development Approach

There are several approaches to prepare and implement a Source Water or Wellhead Protection Plan. The approach typically followed for the Virginia Department of Health (VDH) Source Water Protection Program is based on community involvement by the development of a Local Advisory Committee. Through a series of meetings, this committee works closely with the VDH contractor to identify the potential source water threats (based on the VDH Source Water Assessment) and the options for controlling those threats for that particular waterworks. This information is consolidated in a written Plan that is provided to the waterworks for implementation. The VDH contractor provides guidance and technical support through all phases of Plan development. The general steps in developing a Plan are summarized as follows:

Step 1: FORMATION OF A LOCAL ADVISORY COMMITTEE

Community involvement is key to a successful Source Water Protection Plan. The Local Advisory Committee (LAC) consists of waterworks employees, town or local government officials, county or regional government representatives, board members, and/or water customers. The LAC meets to develop the plan. Extensive knowledge of source water protection or the water system components is not a prerequisite to being a committee member. For those waterworks participating in the Source Water Protection Program, the VDH contractor will assist as needed in forming the LAC.

Step 2: EDUCATE THE COMMITTEE

As an initial step in the development of the Plan, the VDH contractor will meet with the LAC to review source water protection concepts and discuss the details of their water system. Previous knowledge of these issues is not a requirement for participating as a LAC member and assisting in the Plans development. The steps that will be used to prepare the Plan are also presented so that LAC members know what to expect in future meetings.

Step 3: SOURCE WATER ASSESSMENT REVIEW

In most cases, a Source Water Assessment was completed as part of the state Source Water Assessment Program. This assessment acts as an initial inventory of potential sources of contamination and provides a general assessment of the water supply susceptibility. The LAC reviews the findings of the Source Water Assessment and updates the inventory of the potential sources of contamination as necessary. The goal of this step is to identify key issues and challenges for developing and implementing a source water protection plan.

Step 4: IDENTIFICATION OF WELLHEAD PROTECTION OPTIONS

There are a number of protection measures that may be implemented; these include public education, planning and policy approaches, regulatory approaches, and non-regulatory approaches. The following table includes examples of each type of protection measure. The LAC will discuss options that are applicable to their water system, identify and then select protection measures that best protect their water source. The VDH contractor will assist participants in the Source Water Protection Program by providing technical expertise, reference materials, and advice.

<i>Source Water Protection Approaches and Examples of Measures</i>	
Public Education	<ul style="list-style-type: none"> • Working with community groups • Signs along roads that state "Entering a Source Water Protection Area" • Display material on town or water system web site. • Distribute brochures to water customers and residents in the Wellhead Protection Area
Planning and Policy	<ul style="list-style-type: none"> • Compliance Planning • Memo of Inter-jurisdictional Cooperation • Capital Improvement Program • Emergency Response Plan
Regulatory	<ul style="list-style-type: none"> • Zoning: Wellhead Protection Overlay District • Review procedure for subdivisions specifically for Source Water Protection • Septic system ordinances • Sinkhole ordinances
Non-regulatory	<ul style="list-style-type: none"> • Acquisition of property of easements • Use of Value Taxation

Step 5: SOURCE WATER PROTECTION PLAN DEVELOPMENT

Information from the waterworks is used in conjunction with the Source Water Assessment; other identified potential threats, and the control options selected by the LAC to prepare the Plan. Plan components typically include:

- a description of the water system;
- inventory of identified potential sources of contamination (PSC);
- a strategy to manage/minimize current risks;
- a goal to minimize future threats.

The VDH contractor will assist small community waterworks that participate in the Source Water Protection Program in developing their Source Water Protection Plan and will provide copies of the plan for use and implementation by the waterworks.

Step 6: WELLHEAD PROTECTION PLAN IMPLEMENTATION

Once the Plan is completed, the selected protection options are implemented by the waterworks. Implementation often includes notifying the users and nearby residents of the protection measures that are in-place or planned. Community participation is critical to a successful program. The Plan should be an active document with recommendations that are implemented in a timely and efficient manner. The plan should be revisited, reviewed, and appropriately updated at least once a year.

**VDH – Office of Drinking Water
Update Items for HRPDC Meeting
4 June 2014**

- **VDH Waterworks Regulations**
 1. Staff currently reviewing Part III (the “design manual”) of proposed revisions.
 2. Once the internal review is complete, VDH will put together a Regulatory Advisory Panel to review and comment on the proposed revisions. RAP will consist of appropriate stakeholders. VDH now taking nominations for RAP members.
 3. VDH has contracted with IEN (Institute of Environmental Negotiation, out of UVA) to manage the RAP process.
 4. Still looking to start the formal APA process in Jan 2015.

- **Revised Total Coliform Rule**
 1. EPA has completed the provision of training to States via webinars, and has issued draft guidance documents (one is “interim final”, the other is “interim final for comment”).
 2. VDH team has started meeting, to develop draft regulations and implementation strategy
 3. Once VDH has developed draft regs and staff guidance, VDH will be providing training (in partnership with VA AWWA and VRWA) to waterworks on implementation of rule

- **Long Term 2 Enhanced Surface Water Treatment Rule (LT2) – Round 2 of Source Water Monitoring**
 1. VDH has sent out letters to Schedule 1 systems advising of the requirements
 2. Schedule 1 waterworks start no later than Apr 2015, other waterworks start later, based on Schedule
 3. Waterworks need to move quickly to obtain lab services

Draft Policy Proposal

Permitting of Homeowner and Small Business Groundwater Withdrawals

The Virginia Department of Environmental Quality has determined that groundwater withdrawals in the Virginia Coastal Plain are not sustainable. Current withdrawals are causing declines in water levels, land subsidence, and saltwater intrusion. The Department of Environmental Quality has identified these three impacts as significant concerns that require the state to respond with management policies to minimize future impacts to the aquifer system.

DEQ should include a new policy to track and permit groundwater withdrawals from homeowners and small businesses. Currently, DEQ only requires a permit for withdrawals of 300,000 gallons per month or more. A typical household withdraws less than 5,000 gallons per month. Collectively, the estimated withdrawals from these groundwater users equal approximately 28% of the total groundwater withdrawals in the Coastal Plain. Without new policies, more homeowners and businesses will install wells and increase the total groundwater withdrawals from the aquifer system even if other water sources are available.

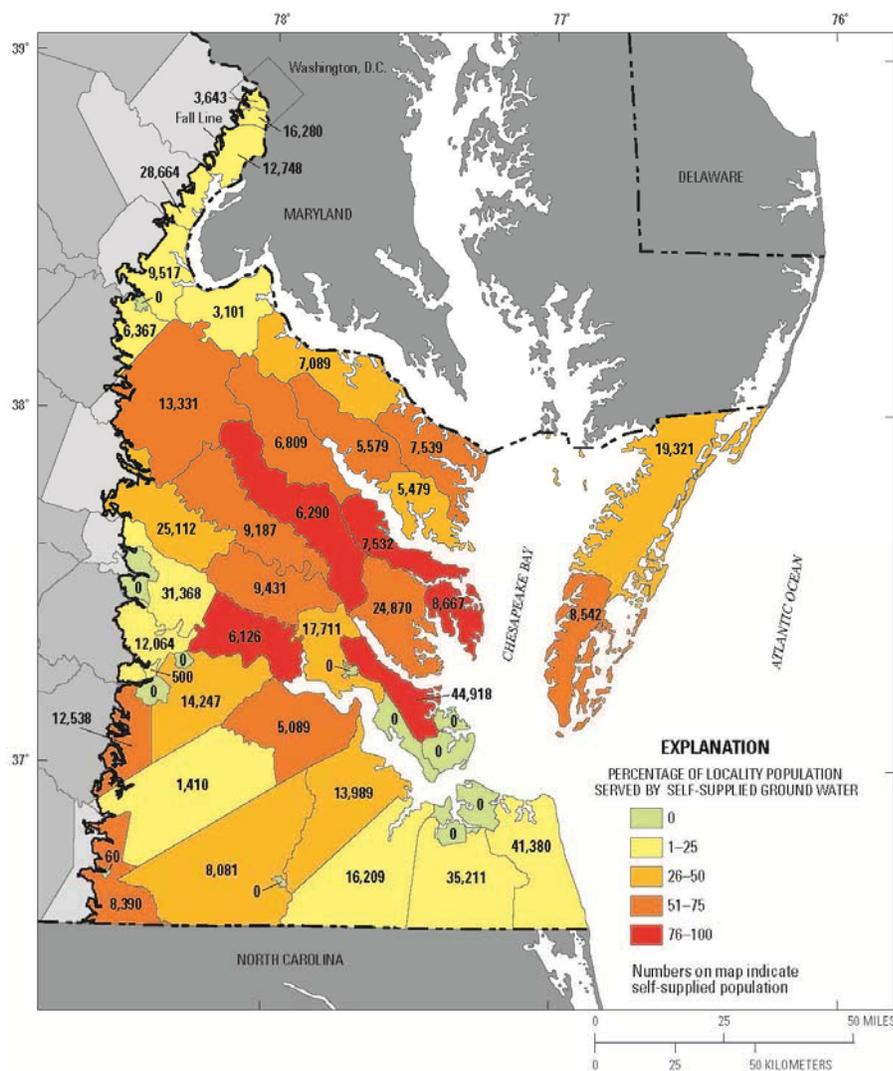


Figure 1. The localities in Virginia's Coastal Plain and the portion of the population that relies on private wells for drinking water are illustrated at left. (Source: Pope, J.P., McFarland, E.R., and Banks, R.B., 2008, Private domestic-well characteristics and the distribution of domestic withdrawals among aquifers in the Virginia Coastal Plain: U.S. Geological Survey Scientific Investigations Report 2007-5250, 47 p., <http://pubs.water.usgs.gov/sir2007-5250>.)

Problem with Status Quo

Current policies for small groundwater withdrawals do not discourage groundwater use or require reporting or fees that would provide data needed to manage the resource. DEQ has estimated that existing groundwater use for large and small users is roughly equal to sustainable use of the aquifers system. DEQ has the existing regulatory authority to manage existing large withdrawals and reject new withdrawals through Groundwater Withdrawal Permits. However, DEQ does not have a policy to manage or limit small withdrawals. Therefore, future use by small, private wells will likely increase and contribute to mining the groundwater system which reduces the long-term groundwater supply.

Water withdrawn from the deep aquifers in the Coastal Plain is not quickly replaced by rainwater seeping into the ground. There is a net loss in available groundwater which is also called “groundwater mining”. Basically, the aquifer system is made up of layers of sand and clay. Water flows through the sand layers horizontally. The clay layers inhibit water from flowing vertically. Therefore, groundwater that is pumped from the deepest aquifers does not quickly get replaced. The deep aquifers are recharged near the western edge of the system (Fall Line near Richmond) and receive a little vertical flow from the shallower aquifers. For example, a house that pumps from a deep aquifer might put most of the water back into the soil with a septic tank. The septic field is in the shallowest aquifer. Less than 10% of the water from the septic tank will ever reach the deep aquifer. Most of it will be used by plants, evaporate, or flow into a ditch or creek.

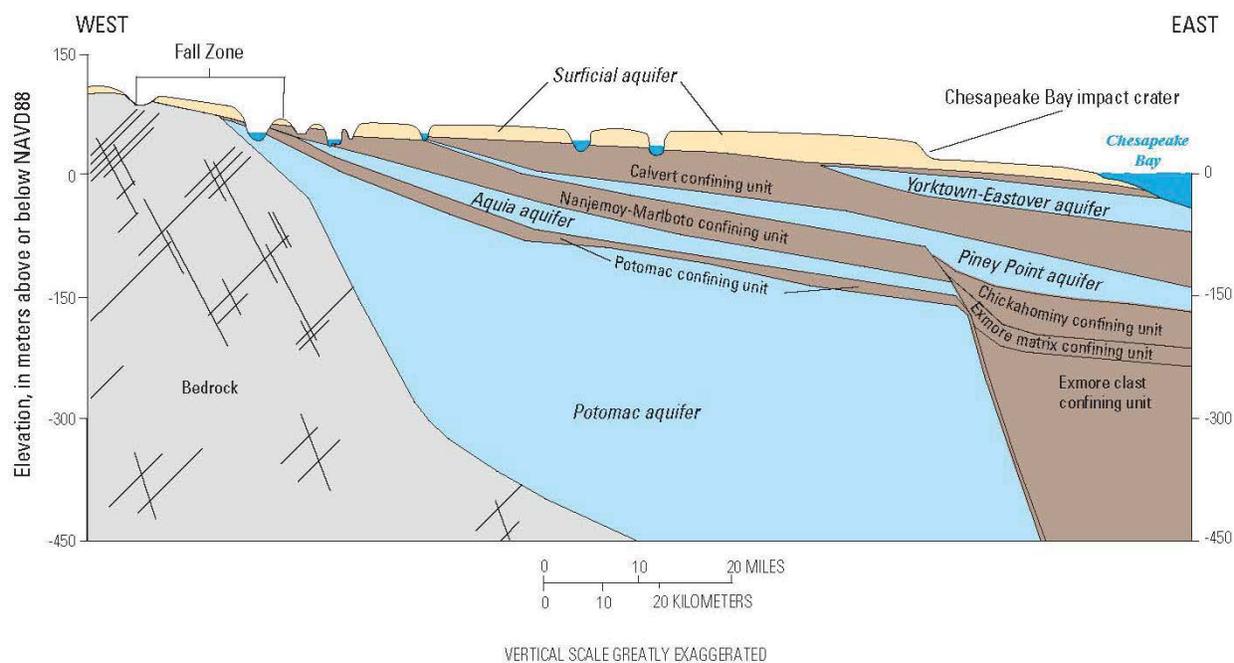


Figure 2. The Potomac aquifer is the deepest and thickest water bearing unit in the Virginia Coastal Plain “layer cake” of aquifers and confining units. (Source: Eggleston, Jack, and Pope, Jason, 2013, Land subsidence and relative sea-level rise in the southern Chesapeake Bay region: U.S. Geological Survey Circular 1392, 30 p., <http://dx.doi.org/10.3133/cir1392>.)

Drivers for Overuse: Legal Framework

Virginia's riparian law grants property owners the right to reasonable use of the groundwater. Reasonable use has not been defined by the courts. It is possible to drill a well almost anywhere in the Virginia Coastal Plan and install a well producing enough potable water to supply a home or business with all the water the owner needs. A permit is required from the Virginia Health Department to confirm that the water is safe but the permit does not limit the amount of groundwater that can be withdrawn. DEQ requires a permit if the owner withdraws more than 300,000 per month. A wasteful homeowner or business could use sixty times more water than a typical home before reaching the permit threshold. Because the permit threshold is so high, there isn't an incentive for these well owners to conserve water or check for leaks. Virginia's laws and regulations don't provide any incentives for homeowners and businesses to choose public water systems over private wells. Over 200,000 people in Hampton Roads rely on private wells for drinking water. There are no estimates of the number of irrigation wells in the region. Public water systems in Hampton Roads primarily use surface water sources. These reservoirs and river intakes require sustainable management and are regularly replenished by rainfall. Using available surface water as a priority allows Virginia to save the groundwater in the aquifer system. Groundwater in the deep aquifers under Hampton Roads has been in the aquifers for tens of thousands of years and will not be quickly replenished.

Drivers for Overuse: Groundwater is free

Homeowners and businesses that rely on groundwater or have irrigation wells do not pay for the amount of groundwater that they withdraw. The well installation and Health Department permit fee typically cost \$4,000 to \$12,000 depending on the depth of the well. These are one-time costs. The operation of a well is less than \$10 per month to cover electricity and water softener salt, if needed. In comparison, a household that uses 5,000 gallons of water per month would pay \$17 to \$57 per month to buy water from the public water systems in Hampton Roads. The homeowner with a well can use up to 300,000 gallons and the only increased costs would be electricity. In comparison, most public water system rates increase with volume and provide a strong disincentive for excessive water use.

Policy Proposal and Objectives

A new policy for small groundwater withdrawals should strive to manage our water resources and minimize groundwater mining. The following objectives would promote these goals:

- Maximize the use of surface water instead of groundwater
- Promote groundwater conservation
- Improve the data available to make informed management decisions
- Eliminate "free" access to groundwater that undermines revenue to support public systems and stresses or overuses our shared groundwater resources.
- Reserve groundwater for remote locations that would be the most expensive to serve by extending public water system service areas

DEQ should proposed regulations to require a permit to operate all wells including irrigation wells. Permits should not be granted to homeowners and business that have access to public water systems. All wells should be metered and report withdrawals annually. A nominal fee for withdrawals of less than 10,000 gallons per month should be collected annually. A fee for withdrawals between 10,000 gallons per month and 300,000 gallons per month should be based on volume of groundwater withdrawn.