

**Attachment 1A  
MEETING OF  
DIRECTORS OF UTILITIES COMMITTEE  
August 6, 2014  
Chesapeake**

**1. Summary of the July 2, 2014 Meeting of the Directors of Utilities Committee**

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

**ACTION:** The summary of the July 2, 2014 meeting was approved.

**2. Public Comment**

There were no public comments.

**3. Program Planning for askHRgreen.org**

HRPDC staff briefed the Committee on campaign highlights from the 2013-14 askHRgreen.org program and described media outreach, public relations activities, and regional events. Staff presented the plan for the 2014-15 campaign, including goals, media strategies, website improvements, and evaluation research. The presentation slides are included as Attachment 1C.

The campaign has maintained a flat budget in past years partly by utilizing carryover funds. Funding proposals for program sustainment, including the enhancement of the Fats, Oils, and Grease Program, will be presented at the September 3, 2014 Committee meeting as part of the draft FY2016 Water and Wastewater Program budgets.

In response to questions from the Committee, the following items were noted:

- Regarding the increase in website visits from 8,513 in 2012-13 to 14,842 visits in 2013-14, it is unclear how much of the growth can be attributed to the “natural growth” in internet use. However, it is understood that more people are accessing the site through tablets and mobile devices; the askHRgreen.org site is optimized for mobile viewing.
- The 2013-14 campaign results indicate that funding was well leveraged to realize a total return on investment of 1.61 to 1. Campaign statistics are provided by the consultant.

**ACTION:** No action.

#### **4. Groundwater Regulatory Update**

The Committee discussed the Department of Environmental Quality's plans to meet with the 14 largest permitted groundwater users to reduce permit limits. It was noted that the agency indicated plans to release the target reduction numbers for all 14 users after meetings are completed in September 2014. Target reductions are based on current amount of groundwater use, location of the withdrawal in the groundwater management area, and the availability of alternate groundwater sources. Following an anticipated 1-year negotiation period, the agency wants to phase in cuts over the 10-year permit term.

HRPDC staff will draft a statement for the Committee's consideration, with the intent of providing comments at the September meetings of the State Water Control Board and State Water Commission and incorporating the statement into the HRPDC legislative agenda. Issues include DEQ's resource management "goals" and implications for groundwater modeling; the need for adequate groundwater monitoring and water use reporting (small users and irrigation wells); locality stranded assets and affordability impacts of acquiring new sources; long-term water supply planning; and impacts to economic development in the region.

**ACTION:** HRPDC staff will draft a regional statement for consideration by the Committee.

#### **5. Management of Private Wells**

The Committee discussed the revised draft white paper describing policy proposals for managing the use of private wells and groundwater withdrawals less than 300,000 gallons per month to mitigate impacts to the Eastern Virginia Groundwater Management Area. The revised draft was approved. HRPDC staff will finalize the white paper and incorporate it into the HRPDC legislative agenda.

**ACTION:** Incorporate final policy proposals into HRPDC legislative agenda.

#### **6. Chlorides Whitepaper**

HRPDC staff briefed the Committee on the draft whitepaper "Chloride Concentrations in Hampton Roads Drinking Water Sources, Salt Water Intrusion and Potential Impacts to Community Water Systems." The presentation slides are included as Attachment 1D. An executive summary will be added per the meeting discussion, and the revised draft whitepaper will be circulated to the Committee for review and comment.

**ACTION:** No action.

## 7. State Water Control Board Draft Order by Consent

The Committee discussed the proposed language of the draft Consent Order distributed by the Department of Environmental Quality on July 18, 2014. The Committee agreed to the following comments at the meeting (additions and ~~deletions~~ are indicated):

- *Section C. Paragraph 8:*

During the ongoing planning for the RWWMP, HRSD and the Localities researched the most cost effective and practical means for development and implementation of the RWWMP. The studies resulted in unanimous support of an alternate regionalization approach whereby HRSD would take responsibility for regional wet weather capacity. Under this approach, HRSD will assume sole responsibility for drafting, funding, and implementing the RWWMP without assuming ownership of Locality sewer system assets. The approach was formally adopted by all the Localities and HRSD through a regional Memorandum of Agreement dated March 10, 2014. The Memorandum of Agreement creates mutually enforceable obligations by and between HRSD and each of the Localities to facilitate the agreed-upon regionalization approach. The Memorandum of Agreement and HRSD's Federal Consent Decree work in conjunction with this Order by Consent to form a coordinated regional approach to providing and maintaining regional wet weather capacity.

- *Section C. Paragraph 11:*

Proper management, operation, and maintenance of sanitary sewer infrastructure must be conducted by the Localities ~~to prevent dry weather unpermitted sanitary sewer overflows. Pursuant to the September 26, 2007 Order by Consent as amended, the Localities (excluding Norfolk) developed MOM plans for DEQ approval and implementation. This order serves to formalize the Localities commitment to implement individual MOM programs.~~

- *Section B. Paragraph 12:*

“Significant Defect” means a physical condition in the sanitary sewer system, including (1) existing or imminent structural failures, cave-ins, and similar defects and (ii) significant sources of inflow and infiltration (including but not limited to missing and/or damaged public clean-outs, missing manhole inserts, direct storm water connections, and unsealed manhole pipe penetrations).

- *Section E. Paragraph 8: This section should be revised to reflect force majeure language from the 2007 Special Order by Consent.*

- *Section E. Paragraph 9: This paragraph should be deleted.*  
**~~Failure to so notify the Regional Director verbally within 24 hours and in writing within three business days, of learning of any condition above, which the parties intend to assert will result in the impossibility of compliance, shall constitute a waiver of any claim to inability to comply with a requirement of this Order.~~**
- *Appendix A: Appendix A should be deleted, as MOM programs are already approved.*

Additional comments will be solicited from the Committee via email. HRPDC staff will compile and circulate consolidated comments to the Committee for review and comment.

**ACTION:** No action.

## 8. Staff Reports

- **Affordability:** HRPDC staff reported on the status of the affordability research project. The presentation slides are included as Attachment 1E. The Committee provided feedback on the analysis approach and next steps. Assumptions for the draft analysis will be circulated to the Committee for review and comment.

**ACTION:** No action.

Committee Meeting Sign-In Sheet  
August 6, 2014

Attachment 1B

Locality/Agency	Representative	Representative	Representative	Representative
HRSD	Ted Henifin			
Chesapeake	David Jurgens			
Franklin				
Gloucester	Arnie Francis			
Hampton	Tony Reyes	Jason Mitchell	Veronica Meade	
Isle of Wight	Frank Haltom	Donald Jennings		
James City County	Doug Powell	Stephanie Luton		
Newport News	Scott Dewhirst			
Newport News	Everett Skipper			
Newport News	Steve Land	Joe Durant		
Norfolk	Kristen Lentz			
Poquoson	Ellen Roberts			
Portsmouth	Bryan Foster			
Smithfield				
Southampton				
Suffolk	Craig Zieseemer			
Surry				
Virginia Beach	Tom Leahy	Bob Montague		
Williamsburg				
Windsor				
York	Brian Woodward			
HRPDC	Whitney Katchmark	Jill Sunderland	Tiffany Smith	
HRPDC	Julia Hillegass	Katie Cullipher	Rebekah Eastep	
New Kent				
DEQ				
EPA				
USGS				
VDH				
VDH				
VDH				
Emergency Managers				
Emergency Managers				
Emergency Managers				
AECOM				
AquaLaw				
Arcadis	Ryan Nagel			
Brown & Caldwell				
CH2M-Hill				
Christian Barton				
Golder Associates				
HDR				
Hurt & Proffitt, Inc.				
McGuire Woods				
Rice Associates				
REMSA				
Troutman Sanders				
Virginia Fusion Center				
Virginia WARN				
URS				
Whitman, Requardt & Assoc.	Bruce Schwenneker			
Private citizens				



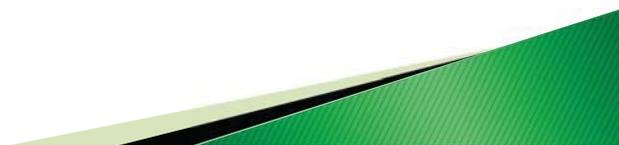
## 2013–2014 Campaign Update and 2014–2015 Plan Highlights



## Campaign Highlights

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- ▶ Conducted
  - a Search Engine Optimization program
  - a Search Engine Marketing Campaign
  - 12 themed media campaigns with creative advertising materials
  - Brand campaign
- ▶ Held media training
- ▶ Distributed 12 newsletters and hundreds of social media posts
- ▶ Contributed to the 3<sup>rd</sup> edition of Green Living
- ▶ Launched Toolbox
- ▶ Trailer appearances and events support
- ▶ Local promotions



# 2013–2014 Calendar

## 2013 - 2014 askHRgreen.org Campaign Calendar

	July 2013	Aug 2013	Sept 2013	Oct 2013	Nov 2013	Dec 2013	Jan 2014	Feb 2014	March 2014	April 2014	May 2014	June 2014
askHRgreen.org -- SEO/SEM		■	■	■	■	■	■	■	■	■	■	■
askHRgreen.org -- Branding Campaign								■	■			
Water Awareness Subcommittee						■			■	■	■	■
Fats, Oils & Grease Education Subcommittee					■			■	■	■		
Stormwater Education Subcommittee				■				■	■		■	
Recycling & Beautification Subcommittee				■								
Green Living Newspaper Insert									■			
askHRgreen.org E-newsletter	■	■	■	■	■	■	■	■	■	■	■	■
Public Relations	■	■	■	■	■	■	■	■	■	■	■	■



## Themed Advertising Messages

- ▶ Fats, Oils & Grease Education – What Not to Flush
  - February 3–9, one week
  - Radio, online, and Facebook
  - Impressions: 571,019
  - Clicks: 1198



# Themed Advertising Messages

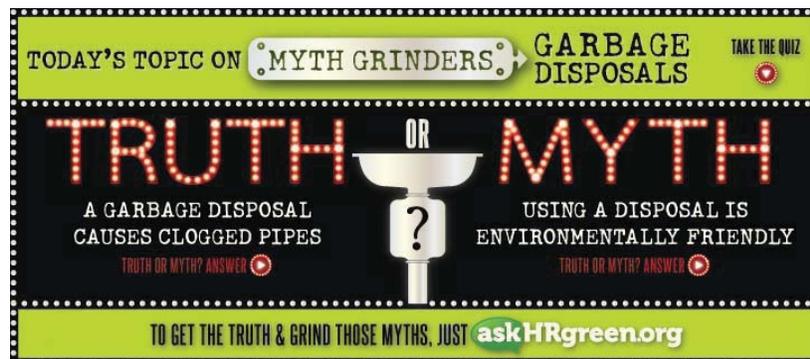
- ▶ Brand Campaign
  - February 10–March 2, three weeks
  - Radio and online
  - Impressions: 2.5 million
  - Clicks: 532



**askHRgreen.org**

# Themed Advertising Messages

- ▶ Fats, Oils & Grease Education – Garbage Disposals
  - March 3–9, one week
  - Radio, online, and Facebook
  - Impressions: 586,060
  - Clicks: 1,944



**askHRgreen.org**

# Themed Advertising Messages

## ▶ Water Awareness – Fix-a-Leak

- March 10–23, 2 weeks
- Radio, online, and Facebook
- Impressions: 1.5 million
- Clicks: 1,884



**askHRgreen.org**

# Themed Advertising Messages

## ▶ Stormwater Education & Water Awareness – Lawncare/Outdoor Watering

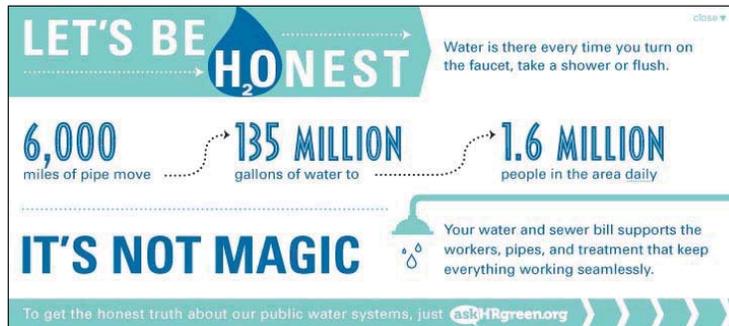
- March 24 – April 6, 2 weeks
- Radio, online, and Facebook
- Impressions: 1.6 million
- Clicks: 1,934



**askHRgreen.org**

# Themed Advertising Messages

- ▶ Water Awareness and Fats, Oils & Grease Education
  - Infrastructure
    - April 21–May 4, two weeks
    - Radio, online, and Facebook
    - Impressions: 1.3 million
    - Clicks: 1,692



[askHRgreen.org](http://askHRgreen.org)

# Themed Advertising Messages

- ▶ Water Awareness – Tap-It
  - June 1–30, four weeks
  - Transit, radio, online, and Facebook
  - Impressions: 3.1 million
  - Web visits: 6,442



[askHRgreen.org](http://askHRgreen.org)

## Green Living & Daily Press

- ▶ Brand, Water Awareness, FOG and Stormwater Education
  - April 23, 2014
  - Print and online
  - Impressions: 325,630

**THERE ARE SO MANY MYTHS ABOUT GREEN LIVING.**  
WANT MORE **TRUTH??**  
JUST VISIT [askHRgreen.org](http://askHRgreen.org)

**MYTH** "BEING GREEN IS HARD AND EXPENSIVE. BESIDES, I'M JUST ONE PERSON."  
**TRUTH** There are 1.6 million people in Hampton Roads and if we each did a little, it would add up to a lot. The truth is that there are plenty of easy ways to go green that are equally easy on the wallet.

**MYTH** "I DON'T NEED TO SCOOP THE POOP... IT'S NATURAL."  
**TRUTH** Rawwater carries nitrogen and bacteria from pet waste into our local waterways, making our water a cloudy green, foul-smelling mess that lacks oxygen. This pollution causes aquatic dead zones, beach closures, fishing restrictions, and warnings on local seafood.

**MYTH** "THOSE 'FLUSHABLE' WIPES ARE SAFE TO FLUSH."  
**TRUTH** Products marketed as "flushable" are regularly found in clogged pipes and backup pumps throughout the sanitary sewer system. Only toilet paper, water, and human waste should be flushed down the toilet. Other items like tissues, paper towels, wipes, feminine hygiene products, and food scraps are all known to clog the lines and pumps of the sanitary sewer system.

**MYTH** "MY LAWN NEEDS FERTILIZER EVERY SPRING."  
**TRUTH** Fertilize out of necessity, not habit. A soil test will tell you specifically what your lawn needs so you can make the right decision. Fertilize naturally by leaving grass clippings on your lawn.

**MYTH** "THE GARBAGE DISPOSAL IS A GOOD WAY TO GET RID OF SCRAPS."  
**TRUTH** Garbage disposals only break food scraps apart into smaller pieces which wash down the drain and clog to pipe walls. A buildup of gunk over time can cause blockages and sewage backups. It's always safer to put food scraps in a compost bin or trash can.

**MYTH** "BOTTLED WATER IS BETTER THAN TAP."  
**TRUTH** Tap water is clean, safe, convenient, and affordable. Hampton Roads drinking water is continuously tested and always meets or exceeds EPA standards for safe drinking water. Price conscious? You can fill 1,900 glasses of tap water for about the price of a single bottle of water.

**MYTH** "CONSERVING WATER MEANS DOING WITHOUT."  
**TRUTH** Using water wisely means not being wasteful. Turn off the faucet when brushing your teeth, take shorter showers, fix leaky toilets and faucets, and water properly and at the right time of day. You won't miss a drop, and you'll be a good steward of our most precious resource, water.

[askHRgreen.org](http://askHRgreen.org)

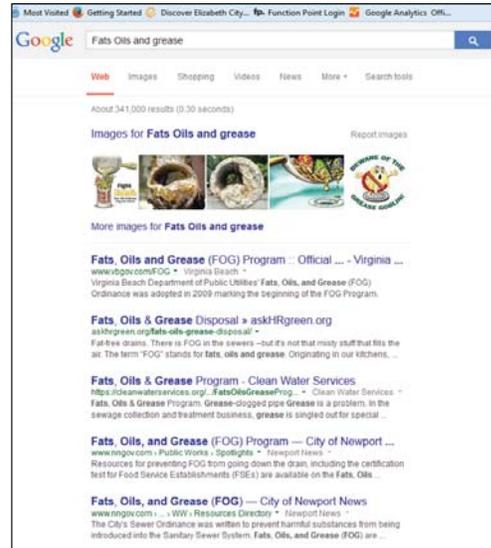
## Search Engine Optimization

- ▶ Impressions: 238,779
- ▶ 45 weeks
- ▶ Organic search results
  - 2012-2013—8,513 clicks
  - 2013-2014—14,842 clicks
  - 57% increase
  - 81% new sessions
  - 54.77 bounce rate

[askHRgreen.org](http://askHRgreen.org)

# Search Engine Marketing

- ▶ Ads and keywords for all committees plus askHRgreen.org
- ▶ 45 weeks
- ▶ Impressions: 403,284
- ▶ Clicks: 5,465



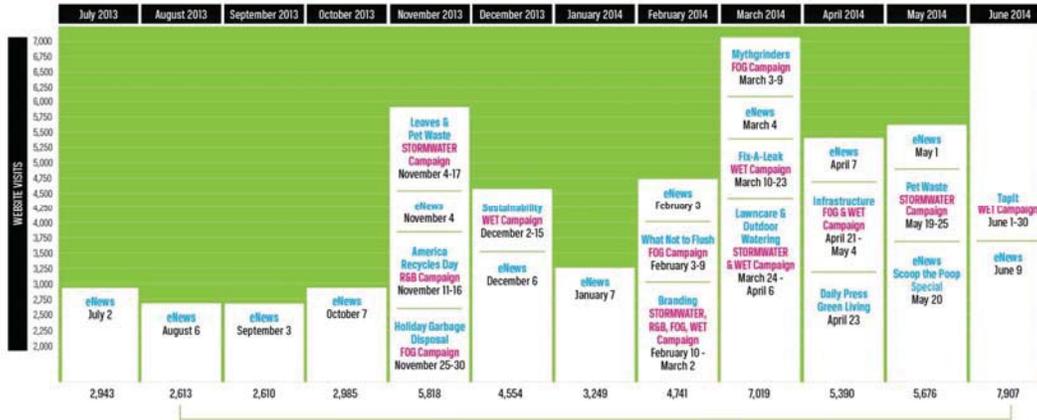
# askHRgreen.org Results

	July - June 2011-12	July - June 2012-13	July - June 2013-14	Previous Year Comparison
Visits	27,685	34,080	55,505	Up 63%
Unique Visitors	21,393	26,081	43,547	Up 67%
Pageviews	67,381	75,251	116,818	Up 55%
Pages per Visit	2.42	2.21	2.10	Down .11
Avg. Visit Duration	2:19	2:10	1:48	Down :22
Bounce Rate	61.63%	61.27%	64.37%	Up 3.10%
% New visits	70.78%	75.50%	77.74%	Up 2.24%

**June visitation set a record for the all time high!**



# 2013–2014 Website Visitation



June 2014 Highest Website Visitation Ever!

**askHRgreen.org**

## Combined Media Results

- ▶ Paid advertising weeks: 45 consecutive
- ▶ Total advertising impressions: 17.8 million
- ▶ Total radio commercials: 3,148
- ▶ Total clicks: 41,665
- ▶ **Total Media Budget: \$179,214**
- ▶ **Total Media Added Value: \$73,715**
- ▶ **Total Media Value: \$261,631**
- ▶ **Total Media ROI: 1.5 to 1**

**askHRgreen.org**

# Public Relations

## Media outreach

- 15 news releases
  - Seasonal**—back to school; keep autumn leaves out of stormdrain; make kitchen grease-free zone; recycle your Christmas tree; deice right when clearing sidewalks; okay to play in dirt gardening tips
  - Events**—prescription drug take-back day, America Recycles Day, Fix-a-Leak Week, GAC
  - News and promotions**—pet waste station grants, new online toolkit, scoop-the-poop pledge, TapIt app
  - Guest columns**—landscaping tips for businesses, sewer consolidation and water awareness



# Public Relations

## Green Living contributions

The screenshot shows a website with a green arrow pointing right and the text "What You Can Do". Below this are three main sections: "In Your Yard", "In Your Community", and "In Your Home". Each section contains several bullet points of advice. At the bottom, there is a featured article titled "Teach Them Well AND THEY'LL LEAD THE WAY" with a photo of a woman and a child.

The article "Waste Away" features a photo of three pipes with green liquid dripping from them. The headline reads "Waste Away" and the sub-headline says "A systematic approach aims to protect the environment." The text discusses sewer consolidation efforts and the regional stormwater management plan.



# Public Relations

- ▶ Media relations coverage



**askHRgreen.org**

# Public Relations

- ▶ E-News
  - 12 + 1 special issues
  - #7 referral source
  - 4,183 subscribers



**askHRgreen.org**

# Public Relations

- ▶ Social Media
  - Facebook #6 referral source on the Website



**askHRgreen.org**

# Public Relations Results

- ▶ Total Public Relations budget: \$15,565
- ▶ Total circulation or audience: 1.6 million
- ▶ Total articles and interviews: 21
- ▶ Total publicity value: \$83,656
- ▶ Total Public Relations ROI: 5.4 to 1

**askHRgreen.org**

# Events

- ▶ askHRgreen participated in 36 regional events in FY 14
  - 18 trailer appearances, 18 table displays
  - Up from 28 events in FY 13
- ▶ Collected 1,143 newsletter signups
- ▶ Total newsletter subscribers: 4,183



# Grassroots Participation

- ▶ Tool Box

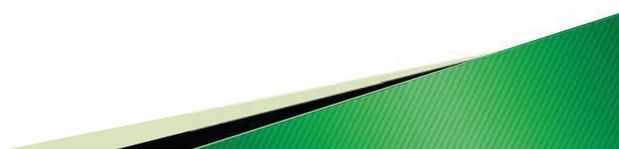


## Total 2013–14 Campaign Results

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- ▶ Total website visitation: Up 63%
- ▶ Total website visitation: 55,505
- ▶ Total new visitors: 43,547
- ▶ Total impressions: 19.5 million
- ▶ Total budget: \$274,452
- ▶ Total exposure value: \$440,525
- ▶ Total ROI: 1.61 to 1

 askHRgreen.org



## What's Next for 2014–2015?

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- ▶ Goals
  - Establish askHRgreen.org as the regional go-to Website for environmental information
  - Continue to build awareness
  - Drive new visitors to the Website
  - Encourage previous visitors to return
  - Assess campaign through research

 askHRgreen.org



# What's Next for 2014–2015?

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- ▶ Media Strategies
  - Search Engine Optimization
  - Search Engine Marketing
  - Website Analysis and Reporting to monitor and change the campaign to reach the largest audience
  - Use committee campaigns to build awareness and target specific audiences with specific messages

 askHRgreen.org



# 2014–2015 Campaign

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- ▶ Creative support through Red Chalk Studios
- ▶ Website
  - Annual security analysis
  - Continue to update and add content
- ▶ Public Relations
  - E-newsletters
  - News releases
  - Media interviews
  - Social media
- ▶ Evaluation research scheduled for January, 2015

 askHRgreen.org



# Salt Water Intrusion in Hampton Roads

presented to Director of Utilities Committee

August 6, 2014

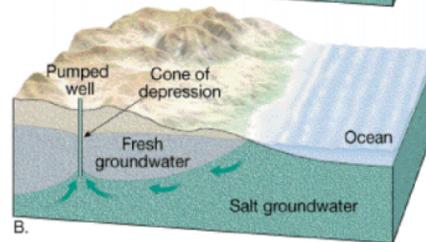
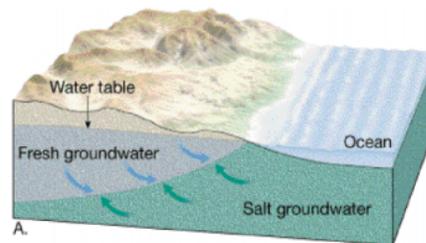
Whitney S. Katchmark

1



## Objective

**Explain why we need a better chloride monitoring network for Hampton Roads**



2





# Policy Issue

## Potential Problem:

If groundwater becomes too salty in areas with lots of private wells, either owners will need expensive treatment systems or localities will have to extend public water system service areas.

## Solution:

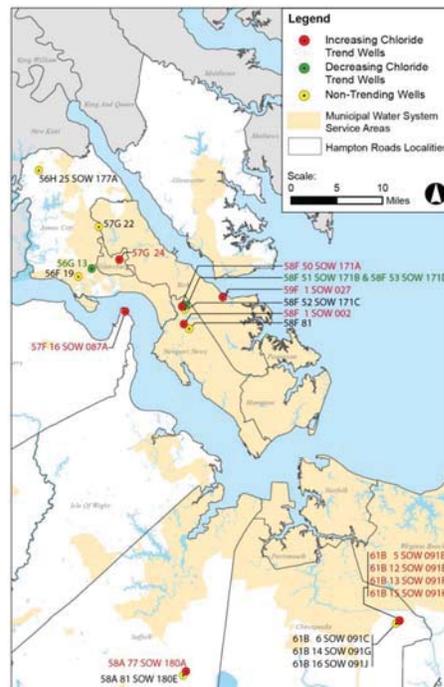
If we have a good monitoring network, we can change groundwater withdrawals to avoid the problem or we can better plan & budget for extending service areas.

3



# Is the problem getting worse?

- Data available does not show a clear trend.
- Very few wells where many chloride measurements have been taken over many years.



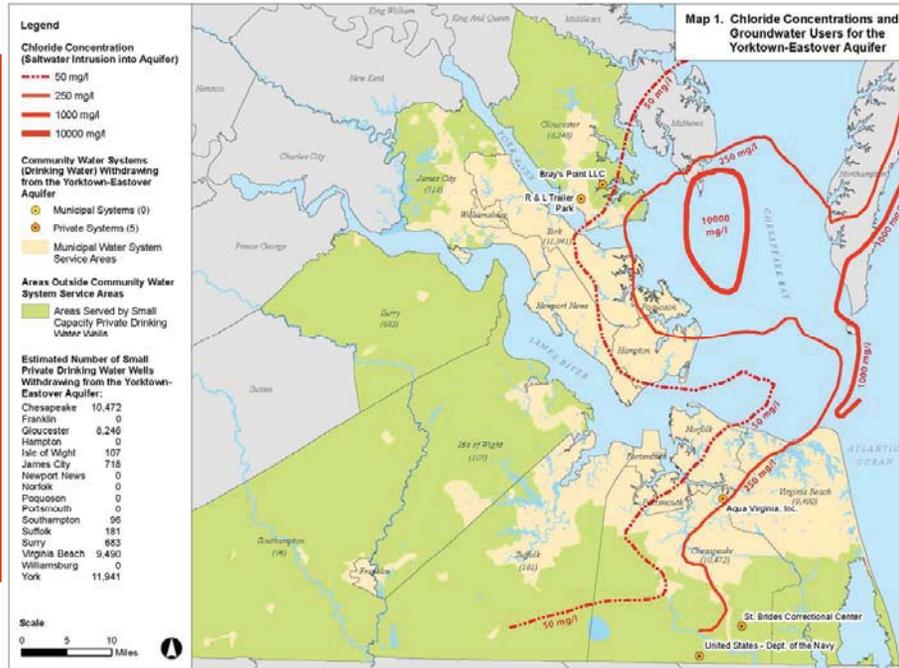
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# Wells at risk of saltwater intrusion

Maps for each aquifer show:

- Where groundwater is salty
- Location of wells for community water systems
- Areas outside service areas that rely on private wells



5



## Take away message

- Support DEQ’s efforts to increase the chloride monitoring network
- Continue assessing potential for saltwater intrusion to impact wells in the region

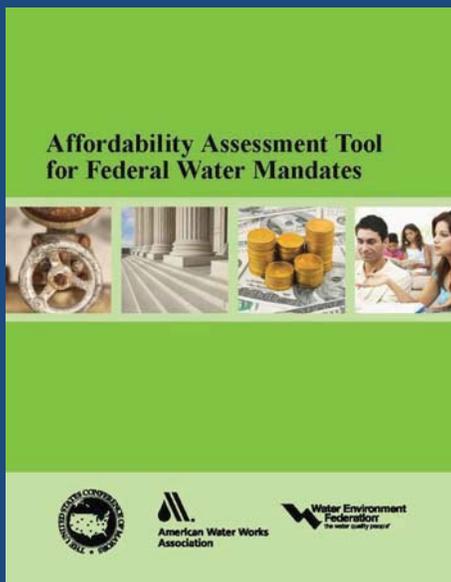
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# Staff Update: Affordability Research

Directors of Utilities Committee Meeting  
August 6, 2014  
Whitney S. Katchmark

1

## USCM/AWWA/WEF/ Affordability Workbooks “Assessing the Affordability of Federal Water Mandates”



- **Initial effort - complete suite of workbooks for wastewater:**
  - EPA Guidance for Estimating the Residential Indicator
  - Socioeconomic Indicators
  - Developing Alternative Metrics
  - EPA’s Secondary Screening Analysis
- **American Community Survey (census) data to be incorporated per report guidance**
- **Locality-specific data to be gathered through data call and incorporated by HRPDC staff.**

2

## USCM/AWWA/WEF/ Affordability Workbooks

“Assessing the Affordability of Federal Water Mandates”

Workbooks provide:

- Calculation of **EPA’s Residential Indicator**
- Compilation of **socioeconomic indicators** (MHI, income distribution, household types and income levels, poverty, housing burden)
- Calculation of **alternate affordability measures** based on socioeconomic indicators
- Calculation of **EPA’s Financial Capability Indicator**

3

## USCM/AWWA/WEF Affordability Workbooks

### Norfolk Test Case: Lessons Learned

- **Workbooks are not very user friendly.** Although data input was modest, it was difficult and time consuming to locate utility input fields.
- **One size does not fit all.** The tool is designed for the average utility. Regional assumptions are needed.
  - Identification of a specific year for projected costs
  - Future dollars vs. current dollars
  - Allocation of regional costs (HRSD) to be reflected in locality worksheets
  - Locality projected costs for O&M and CIP (annualized debt service)

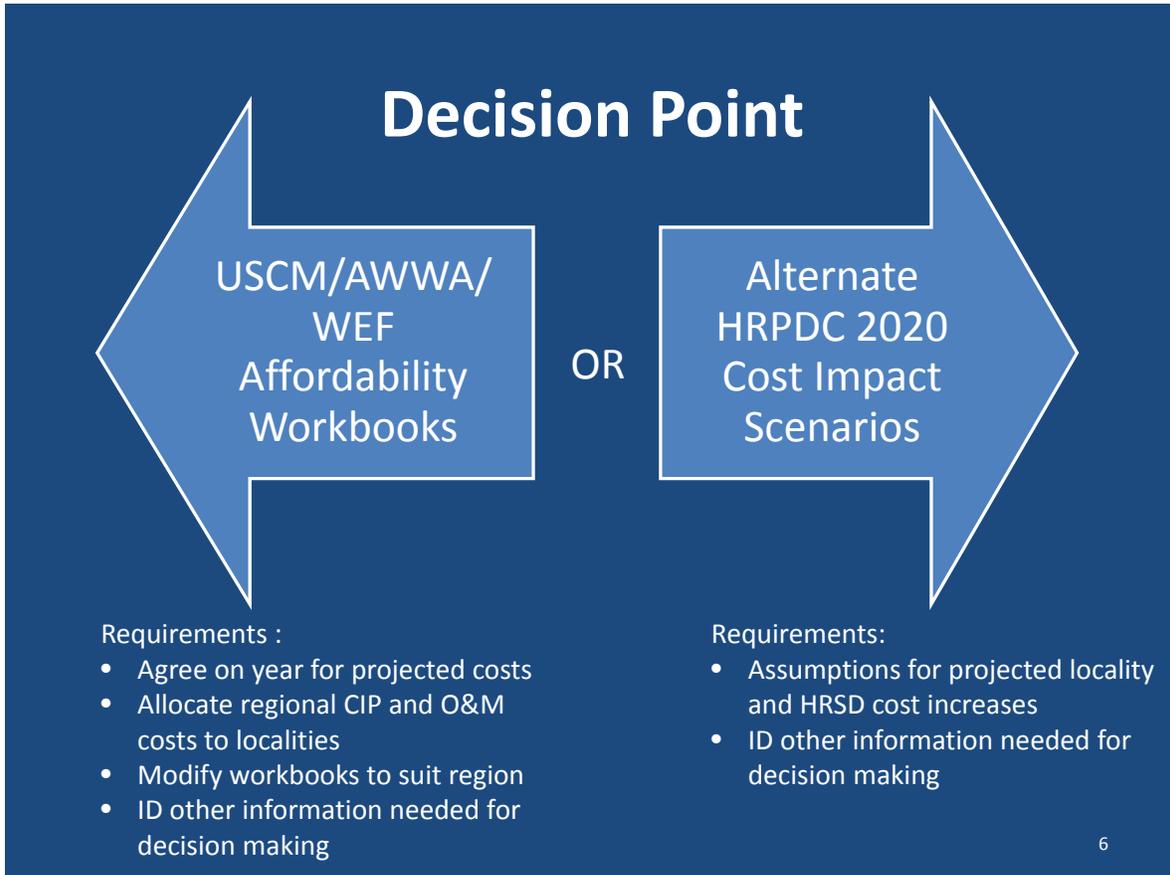
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ID	Description	Units	Notes
1	Annual Wastewater Utility Operation and Maintenance (O&M) Expenses (Excluding Depreciation)	\$	Current annual wastewater O&M expenses (excluding depreciation).
2	Annual Wastewater Utility Debt Service (Principal and Interest)	\$	Current annual wastewater debt service costs (principal and interest).
3	Estimated Annual Wastewater Utility O&M Expenses (Excluding Depreciation)	\$	Estimated annual wastewater O&M expenses, including proposed projects, in current year dollars (excluding depreciation).
4	Estimated Annual Wastewater Utility Debt Service (Principal and Interest)	\$	Estimated annual wastewater debt service costs, including proposed projects, in current year dollars (principal and interest).
5	Wastewater - Average Annual Household Bill - All Households	\$	
5.1	Wastewater - Average Annual Household Bill - Single Family	\$	
5.2	Wastewater - Average Annual Household Bill - Multi Family	\$	
6	Water - Average Annual Household Bill - All Households	\$	
6.1	Water - Average Annual Household Bill - Single Family	\$	
6.2	Water - Average Annual Household Bill - Multi Family	\$	
7	Water - Average Annual Household Consumption - All Households	gal	
7.1	Water - Average Annual Household Consumption - Single Family	gal	
7.2	Water - Average Annual Household Consumption - Multi Family	gal	
8	General Obligation Bond - Most Recent Rating (Locality-wide)	--	
8.1	Rating Date	--	
8.2	Rating Agency (Moody's or S&P)	--	
9	Revenue Bond - Most Recent Rating (Wastewater Fund or Wastewater/Water Fund)	--	Data Sources: Moody's Investors rating service: <a href="http://www.moody.com/">http://www.moody.com/</a> S&P rating service: <a href="http://www.standardandpoors.com/">http://www.standardandpoors.com/</a>
9.1	Rating Date	--	
9.2	Rating Agency (Moody's or S&P)	--	
9.3	Bond Insurance?	Y/N	Yes or no
10	Summary Bond Rating	--	EPA Criteria states that the summary bond rating is the most recent of the G.O. or revenue bonds.
11	Direct Net Debt (General Obligation Bonds Excluding Double-Barreled Bonds)	\$	General obligation debt outstanding that is supported by the property within your service area (locality-wide debt repaid by property taxes, excluding debt repaid by special user fees).
12	Debt of Overlapping Entities (Proportionate Share of Multijurisdictional Debt)	\$	See the "References" worksheet for instructions and a template to calculate this debt.

**USCM/AWWA/WEF Affordability Workbook Requirements:**

- Agree on year for projected costs
- Allocate regional CIP and O&M costs to localities
- Modify workbooks to suit region

5



6

## Alternate HRPDC Analysis

- Develop **2020 cost scenarios** for water, wastewater, & stormwater
- Assess cost **impacts on different levels** of household incomes
- Estimate the **number of households burdened** by 2020 costs
- Provide locality-specific socioeconomic data workbooks for reference

7

## Alternate HRPDC Analysis

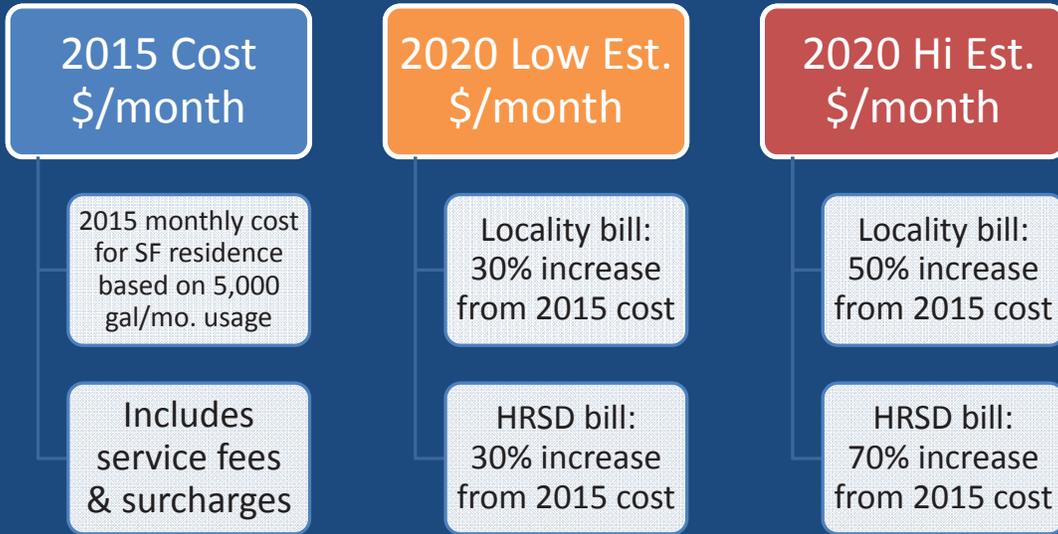
### WATER COST ASSUMPTIONS



8

# Alternate HRPDC Analysis

## WASTEWATER COST ASSUMPTIONS



# Alternate HRPDC Analysis

## STORMWATER COST ASSUMPTIONS



# Alternate HRPDC Analysis 2020 WASTEWATER COST ESTIMATES

Entity	US CENSUS DATA		Monthly Cost per Single Family Residence (5,000 gal/mo. Usage)														
	No. of Households (2012)	Median Household Income (MHI) in 2012 adj (\$)	2015 Wastewater Utility Expenses (FY15 Rates)			2020 Estimated Wastewater Utility Expenses											
			Locality Collection Cost	HRSD Treatment Cost	2015 Cost (\$/mo)	2015 Cost (% LG MHI)	2015 Cost (% MSA MHI)	Low Estimate Locality Cost 30% Increase on FY15 Cost	Low Estimate HRSD Cost 30% Increase on FY15 Cost	Low Est. (\$/mo)	Low Est. (% LG MHI)	Low Est. (% MSA MHI)	High Estimate Locality Cost 50% Increase on FY15 Cost	High Estimate HRSD Cost 50% Increase on FY15 Cost	High Est. (\$/mo)	High Est. (% LG MHI)	High Est. (% MSA MHI)
Chesapeake	80,343	\$ 65,562	\$ 25.95	\$ 25.60	\$ 51.55	0.93%	1.10%	\$ 33.74	\$ 33.28	\$ 67.02	1.23%	1.44%	\$ 38.93	\$ 43.52	\$ 82.45	1.51%	1.77%
Franklin*	3,532	\$ 33,447	\$ 36.56	N/A	\$ 36.56	1.31%	0.78%	\$ 40.22	N/A	\$ 40.22	1.44%	0.86%	\$ 47.53	N/A	\$ 47.53	1.71%	1.02%
Gloucester County	13,685	\$ 59,927	\$ 25.69	\$ 25.60	\$ 51.29	1.03%	1.10%	\$ 33.40	\$ 33.28	\$ 66.68	1.23%	1.44%	\$ 38.54	\$ 43.52	\$ 82.06	1.51%	1.77%
Hampton	52,797	\$ 47,472	\$ 14.30	\$ 25.60	\$ 39.90	1.01%	0.86%	\$ 18.59	\$ 33.28	\$ 51.87	1.01%	0.86%	\$ 21.45	\$ 43.52	\$ 65.00	1.23%	1.44%
Isle of Wight County	13,353	\$ 66,781	\$ 27.00	\$ 25.60	\$ 52.60	0.95%	1.13%	\$ 35.10	\$ 33.28	\$ 68.38	1.23%	1.44%	\$ 40.50	\$ 43.52	\$ 84.02	1.51%	1.77%
James City County	27,360	\$ 79,435	\$ 16.10	\$ 25.60	\$ 41.70	0.63%	0.89%	\$ 20.93	\$ 33.28	\$ 52.91	0.95%	1.13%	\$ 24.15	\$ 43.52	\$ 67.68	1.23%	1.44%
Newport News	70,446	\$ 47,476	\$ 25.46	\$ 25.60	\$ 51.06	1.29%	1.09%	\$ 33.10	\$ 33.28	\$ 66.38	1.23%	1.44%	\$ 38.19	\$ 43.52	\$ 81.71	1.51%	1.77%
Norfolk	86,347	\$ 42,644	\$ 24.50	\$ 25.60	\$ 50.10	1.41%	1.07%	\$ 31.85	\$ 33.28	\$ 63.13	1.41%	1.07%	\$ 36.75	\$ 43.52	\$ 80.27	1.41%	1.07%
Poquoson	4,592	\$ 85,033	\$ 31.00	\$ 25.60	\$ 56.60	0.80%	1.21%	\$ 40.30	\$ 33.28	\$ 73.58	1.04%	1.58%	\$ 46.50	\$ 43.52	\$ 90.02	1.27%	1.93%
Portsmouth	63,781	\$ 42,487	\$ 18.58	\$ 25.60	\$ 44.18	1.25%	0.95%	\$ 24.15	\$ 33.28	\$ 47.43	1.62%	1.23%	\$ 27.87	\$ 43.52	\$ 71.39	2.02%	1.53%
Smithfield Town	2,964	\$ 85,030	\$ 29.57	\$ 25.60	\$ 55.17	0.78%	1.18%	\$ 38.44	\$ 33.28	\$ 71.72	1.01%	1.54%	\$ 44.36	\$ 43.52	\$ 87.88	1.24%	1.88%
Southampton*	6,532	\$ 46,703	\$ 41.00	N/A	\$ 41.00	1.05%	0.88%	\$ 45.10	N/A	\$ 45.10	1.16%	0.97%	\$ 53.30	N/A	\$ 53.30	1.37%	1.14%
Suffolk	30,623	\$ 65,394	\$ 43.25	\$ 25.60	\$ 68.85	1.26%	1.48%	\$ 56.23	\$ 33.28	\$ 89.51	1.64%	1.92%	\$ 64.88	\$ 43.52	\$ 108.40	1.99%	2.32%
Surry**	2,572	\$ 52,955	\$ 34.20	N/A	\$ 34.20	0.77%	0.73%	\$ 37.62	N/A	\$ 37.62	0.85%	0.81%	\$ 44.46	N/A	\$ 44.46	1.01%	0.95%
Virginia Beach	165,376	\$ 61,626	\$ 30.81	\$ 25.60	\$ 56.41	1.10%	1.21%	\$ 40.05	\$ 33.28	\$ 73.33	1.43%	1.57%	\$ 46.22	\$ 43.52	\$ 89.74	1.75%	1.92%
Williamsburg	4,281	\$ 50,865	N/A	\$ 25.60	\$ 25.60	0.60%	0.55%	N/A	\$ 33.28	\$ 33.28	0.79%	0.71%	N/A	\$ 43.52	\$ 43.52	1.03%	0.93%
Windsor	2,563	\$ 60,165	\$ 27.00	\$ 25.60	\$ 52.60	1.05%	1.13%	\$ 35.10	\$ 33.28	\$ 68.38	1.36%	1.47%	\$ 40.50	\$ 43.52	\$ 84.02	1.68%	1.80%
York County	22,830	\$ 71,974	\$ 22.00	\$ 25.60	\$ 47.60	0.79%	1.02%	\$ 28.60	\$ 33.28	\$ 61.88	1.03%	1.33%	\$ 33.00	\$ 43.52	\$ 76.52	1.28%	1.64%
MSA (Virginia Beach-Norfolk-Newport News, VA-NC)	623,964	\$ 55,997															

Low:  
30% Locality  
30% HRSD

High:  
50% Locality  
70% HRSD

# Alternate HRPDC Analysis Number of Impacted Households

Entity	SUMMARY OF HOUSEHOLD INCOME BY LOCALITY											
	% of all people whose income in the Past 12 months was below the Poverty Level	Total Households	HOUSEHOLDS		INCOME AND BENEFITS (IN 2012 INFLATION-ADJUSTED DOLLARS)							
			Households with Cash Assistance or Food Stamps/ SNAP (%)	Elderly Households (%)	Median Household Income (MHI) in past 12 mos. 2012 adj (\$)	Households with income Less than \$10,000	Households with Income \$10,000 to \$14,999	Households with Income \$15,000 to \$24,999	Households with income to poverty ratio < or = 1	Households with income to poverty ratio < or = 1 (%)	Households with Income \$25,000 to \$34,999	Households with income to poverty ratio of 1 to 1.5 (%)
Chesapeake	10.7%	80,343	11.70%	10.2%	\$ 51,550	3,048	2,955	6,202	13,205	16.5%	6,375	8.3%
Franklin*	23.2%	8,394										4.9%
Gloucester County	8.5%	13,685										9.4%
Hampton	17.1%	52,797										9.1%
Isle of Wight County	10.4%	13,353										7.9%
James City County	10.0%	27,360										3.9%
Newport News	16.1%	70,446										12.7%
Norfolk	21.2%	86,347										12.3%
Poquoson	4.1%	4,592										4.4%
Portsmouth	19.2%	36,781										13.4%
Smithfield Town	7.2%	2,964										5.3%
Southampton*	17.3%	6,532										10.4%
Suffolk	10.8%	30,623										10.3%
Surry**	9.0%	2,572										8.4%
Virginia Beach	8.8%	165,376										9.6%
Williamsburg	18.4%	4,281										12.4%
Windsor	12.6%	2,563										9.8%
York County	10.6%	22,830										5.2%
MSA (Virginia Beach-Norfolk-Newport News, VA-NC)	13.1%	623,964	12.10%	20.6%	\$ 55,997	39,686	27,834	56,637	124,157	19.9%	62,086	10.0%

Vulnerable Populations:

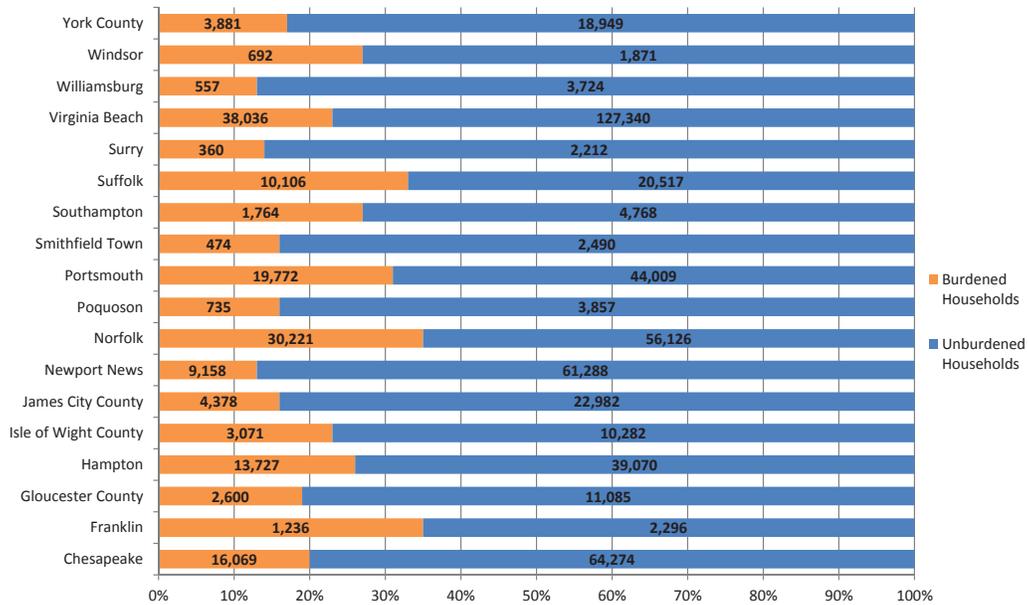
- Households receiving public assistance
- Elderly households
- % population in poverty
- Households in poverty or just above poverty threshold

(Income to poverty ratio <1 to approx 1)

# Alternate HRPDC Analysis

## Number of Impacted Households - Wastewater

2015 Wastewater Costs – "Burdened" Households Paying 2% or More of Income

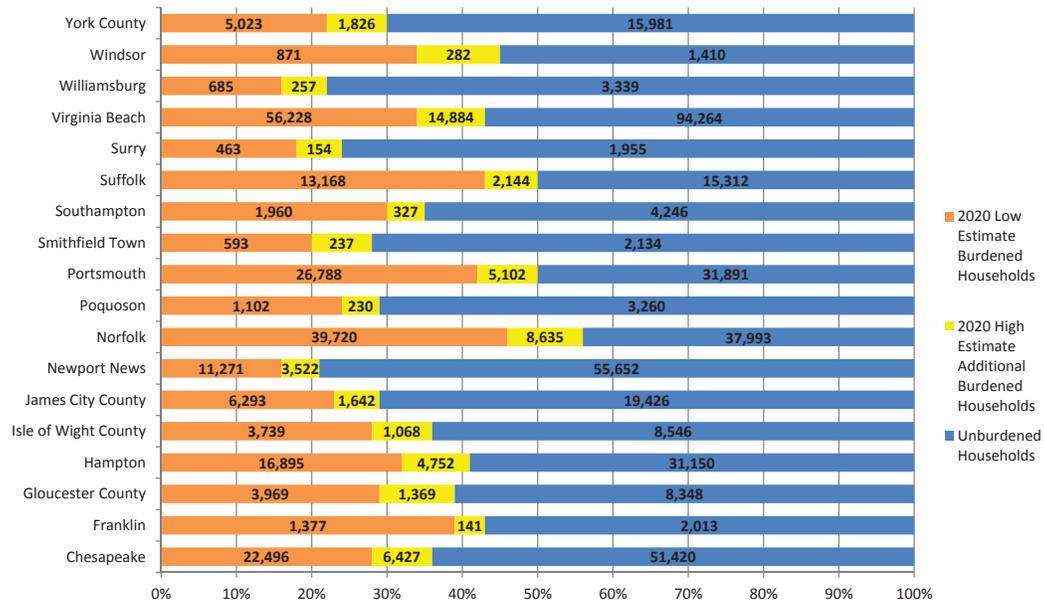


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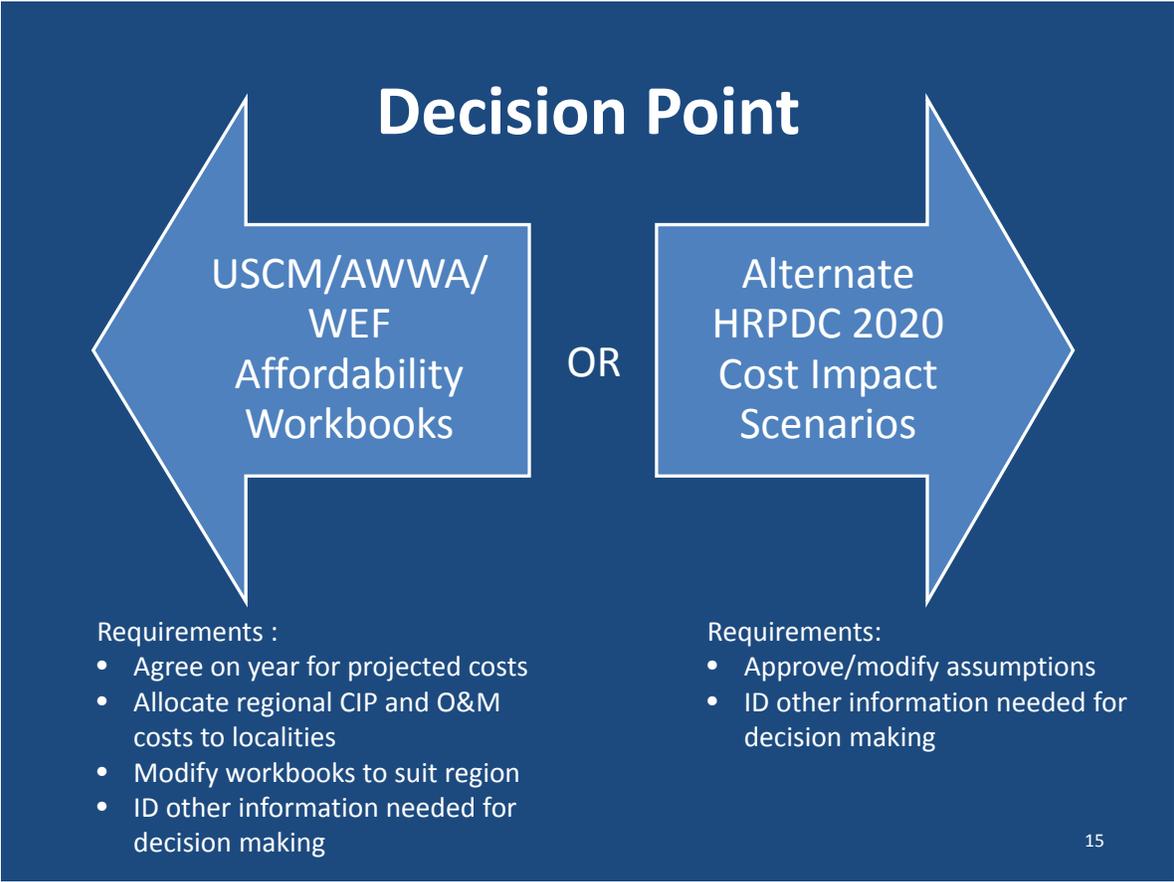
# Alternate HRPDC Analysis

## Number of Impacted Households - Wastewater

2020 Wastewater Costs - "Burdened" Households Paying 2% or More of Income



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In Virginia, the use of groundwater is typically tracked but not regulated by the Department of Environmental Quality. However, the State Water Control Board may declare a portion of the state to be a Groundwater Management Area which establishes a regulatory program that requires groundwater users to obtain permits from DEQ in order to withdraw more than 300,000 gallons per month. Currently, two Groundwater Management Areas have been created: Eastern Virginia and Eastern Shore GWMA.

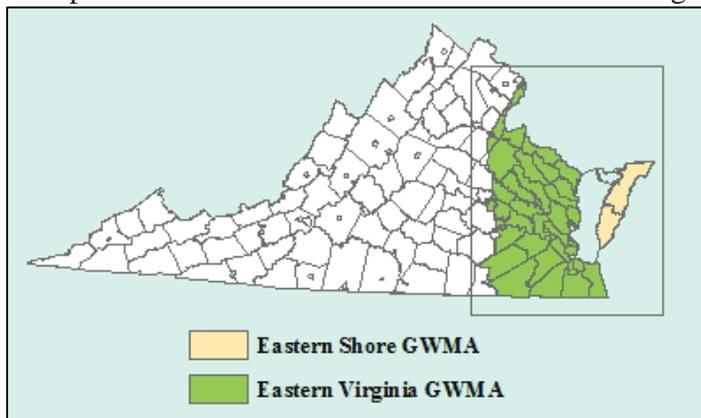
The objective of Virginia's groundwater management program was defined by the Groundwater Act of 1973. The Act established that groundwater resources in Virginia belong to the public and control of the resources should be implemented to protect public welfare, safety, and health.

**Ground Water Act of 1973:** *The General Assembly hereby determines and finds that, pursuant to the Groundwater Act of 1973, the continued, unrestricted usage of ground water is contributing and will contribute to pollution and shortage of ground water, thereby jeopardizing the public welfare, safety and health. It is the purpose of this Act to recognize and declare that the right to reasonable control of all ground water resources within this Commonwealth belongs to the public and that in order to conserve, protect and beneficially utilize the ground water of this Commonwealth and to ensure the public welfare, safety and health, provision for management and control of ground water resources is essential. (§ 62.1-254)*

At the State Water Commission meeting on July 16, 2013, the director of the Department of Environmental Quality discussed the groundwater management issues in the Virginia Coastal Plain. The Coastal Plain is the same geographic area as the expanded Eastern Virginia GWMA. The DEQ director identified three management issues of concern:

1. Reversal of the hydraulic gradient (groundwater flow) leads to salt water intrusion
2. Declining groundwater levels
3. Land subsidence and loss of aquifer storage

We support DEQ's initiative to evaluate these impacts and consider changes to Virginia groundwater management policies and recommend using adaptive management techniques to incorporate new research and information into management decisions.



The three management issues identified by DEQ are not inherently a threat to public welfare, safety and health. It is important that DEQ takes a sophisticated management approach that starts with defining specific impacts to public welfare if salt water intrusion, declining water levels, and land subsidence continue. DEQ should not reduce existing groundwater withdrawals or deny all new permits without considering the costs of finding other water sources compared to the impacts

of continued groundwater withdrawals. Virginia needs a groundwater management program that balances the protection of all groundwater users with broad consideration of economic impacts, public health, and social and environmental equity.

### Existing Management & Permit Program

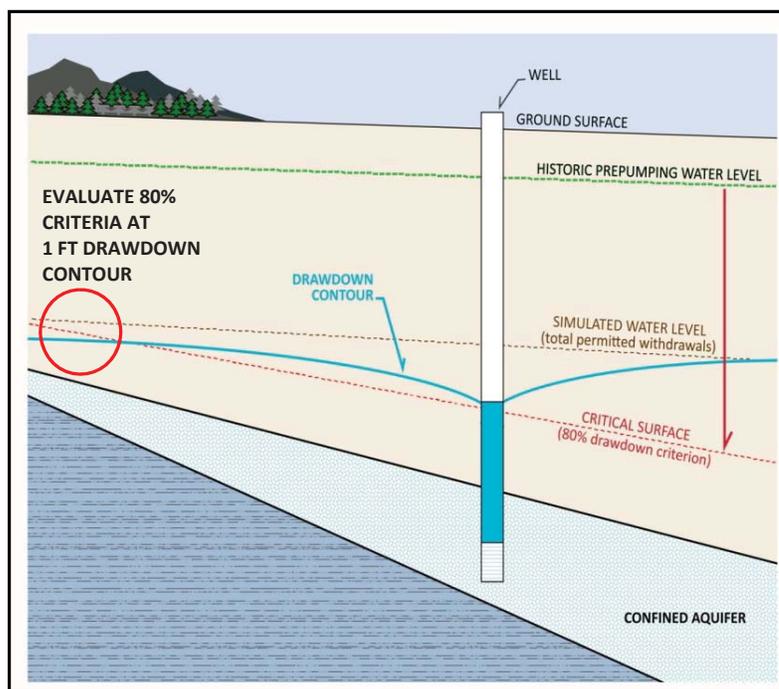
Virginia is fortunate to have established a groundwater management program before experiencing a crisis such as wide-spread failure of wells. The management program has not met all of its objectives but has limited the growth of groundwater withdrawals and collected significant information about the groundwater system and users.

Virginia's program is primarily driven by two elements of the permit application: justification of beneficial use and the technical evaluation. The state should revise the criteria used in the technical evaluation to an adaptive process that acknowledges data gaps and informs applicants of potential, future permit restrictions if new research shows increasing impacts to the public welfare. Ideally, the state's groundwater program would establish triggers based on monitoring data that measures water levels, salinity, and land subsidence.

The existing regulations allow an adaptive approach. The regulations state that each application undergoes a technical evaluation *to demonstrate that the maximum safe supply of groundwater will be preserved and protected for all other beneficial uses and that the applicant's proposed withdrawal will have no significant unmitigated impact on existing groundwater users or the groundwater resource*. DEQ's management program needs additional data to assess the significance of impacts of groundwater withdrawals. Recent model improvements and analysis of monitoring data have improved our understanding of the coastal plain system but lack the detail necessary to implement adaptive management.

The technical evaluation addresses the three management concerns identified by DEQ at the State Water Commission meeting. The process determines the areas that will experience at least one foot of water level declines due to the proposed withdrawal and requires that the 80% criteria are met within those areas.

The technical evaluation also must demonstrate that the proposed groundwater withdrawal will not result in salt water intrusion or the movement of waters of lower quality to areas where such movement would result in adverse impacts on existing



Permit application would not pass 80% drawdown criteria.

groundwater users or the groundwater resource.

The applicant also must demonstrate that no pumps are placed lower than the top of the uppermost confined aquifer that a well uses in order to prevent dewatering of a confined aquifer, loss of inelastic storage, or damage to the aquifer from compaction.

The existing technical evaluation process addresses the potential for withdrawals to cause water level declines, salt water intrusion, and, to a less extent, land subsidence. Monitoring data for groundwater levels, salinity/water quality, and land subsidence indicates that existing withdrawals are having some impact on the groundwater resource. DEQ has a process to identify these impacts but needs a methodical approach to evaluate the significance of these impacts and provide a framework on how to balance them with the costs of reducing groundwater withdrawals.

### **Recommendations for Management & Permit Program**

The technical evaluation criteria should be reexamined and efforts made to incorporate adaptive management triggers and strategies. DEQ should attempt to define “a significant impact to groundwater users or the groundwater resource” and develop a research and monitoring program to better understand how to avoid significant impacts.

**Declining Water Levels:** The 80% criteria is a conservative approach that was chosen to avoid dewatering aquifers. Unfortunately, the groundwater model used to evaluate past withdrawals did not accurately predict water level declines and in a few areas water levels have dropped below the top of the aquifer even though the 80% criteria should have prevented it. The consequences of letting the groundwater level drop below the top of the aquifer along the Fall Line may not have significant impacts to recharging the aquifer system. Also, if the communities located along the Fall Line are not experiencing problems with wells or do not use groundwater, then it is less important to maintain water levels to meet the 80% criteria. DEQ should conduct a study of the areas with water levels below the top of the aquifer. If the consequences to these communities are not significant, the 80% criteria could be replaced with less conservative criteria that maintains water levels above the top of the aquifer without the safety factor imposed by the 80% criteria. Specific research to support a risk based approach would include:

1. Develop a study to evaluate the recharge capacity along the Fall Line and how it is impacted when groundwater levels drop below the top of the aquifers.

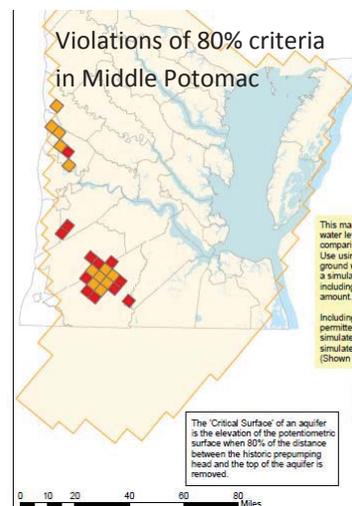
#### *Excerpt 9VAC25-610-110*

#### **Evaluation criteria for permit applications.**

The board's technical evaluation demonstrates that the stabilized effects from the proposed withdrawal in combination with the stabilized combined effects of all existing lawful withdrawals will not lower water levels, in any confined aquifer that the withdrawal impacts, below a point that represents 80% of the distance between the land surface and the top of the aquifer.

The board's technical evaluation demonstrates that the proposed groundwater withdrawal will not result in salt water intrusion or the movement of waters of lower quality to areas where such movement would result in adverse impacts on existing groundwater users or the groundwater resource.

2. Compare water levels modeled for total permitted, modeled at actual use, and measured water levels in areas where impacts to groundwater users are likely to occur to assess the risk that the model will inaccurately predict water level declines.
3. Develop a monitoring network designed to protect specific groundwater users with limited water supply alternatives or sensitive natural resources.
4. Survey private well owners in areas where the 80% criteria have been violated to determine their well depths and better define potential impacts if water levels continue to decline.



**Salt Water Intrusion:** DEQ should identify the areas in the Coastal Plain that are most reliant on groundwater and most susceptible to increased salt water intrusion. The technical evaluation of groundwater withdrawal permits should focus on minimizing impacts to these areas. The existing groundwater quality data, as summarized in USGS report, “[Groundwater-Quality Data and Regional Trends in the Virginia Coastal Plain, 1906–2007](#)” does not show a significant, regional trend of increasing salt water intrusion. The monitoring locations were not chosen to optimize the evaluation of salt water intrusion. Monitoring was conducted at the locations of existing wells rather than constructing new wells along the salt water interface. Permitted groundwater withdrawals should not be reduced without a more robust and effective monitoring program that demonstrates the negative impacts of salt water intrusion on public welfare. DEQ could transition to an adaptive management approach by implementing the following measures:

1. Establish a chloride monitoring network strategically located to protect groundwater users.
2. Conduct cost-benefit analysis of saltwater intrusion including health risks, taste, cost of membrane upgrades for treatment plants, and cost of extending public water systems to susceptible areas.
3. Set a chloride concentration or rate of change along the salt water interface that triggers permit reductions.

**Land Subsidence:** Measurements of land subsidence have only been collected in a few locations in the Virginia Coastal Plain. The USGS report “[Land subsidence and relative sea-level rise in the southern Chesapeake Bay region](#)” summarizes the available data and concludes that groundwater withdrawals are causing aquifer compaction resulting in land subsidence. However, the rate of subsidence is only 1.1 to 4.8 mm per year. There is no urgent need to reduce groundwater withdrawals without a better understanding of the relationship between groundwater and land subsidence. DEQ could incorporate an adaptive management approach to evaluate groundwater withdrawal permits relative to land subsidence by implementing the following research and policies:

1. Measure land subsidence in vulnerable areas and across a larger portion of the Virginia Coastal Plain to determine the spatial extent, magnitude, and rate of subsidence.
2. Incorporate subsidence into a groundwater model to project and evaluate future land subsidence.
3. Compare projected land subsidence associated with existing and proposed groundwater withdrawals to the projected sea level rise.
4. Conduct cost-benefit analysis of reducing groundwater withdrawals to minimize land subsidence including the impacts of recurrent flooding and cost of alternative water sources.
5. Set a rate of subsidence in specific areas that triggers permit reductions.

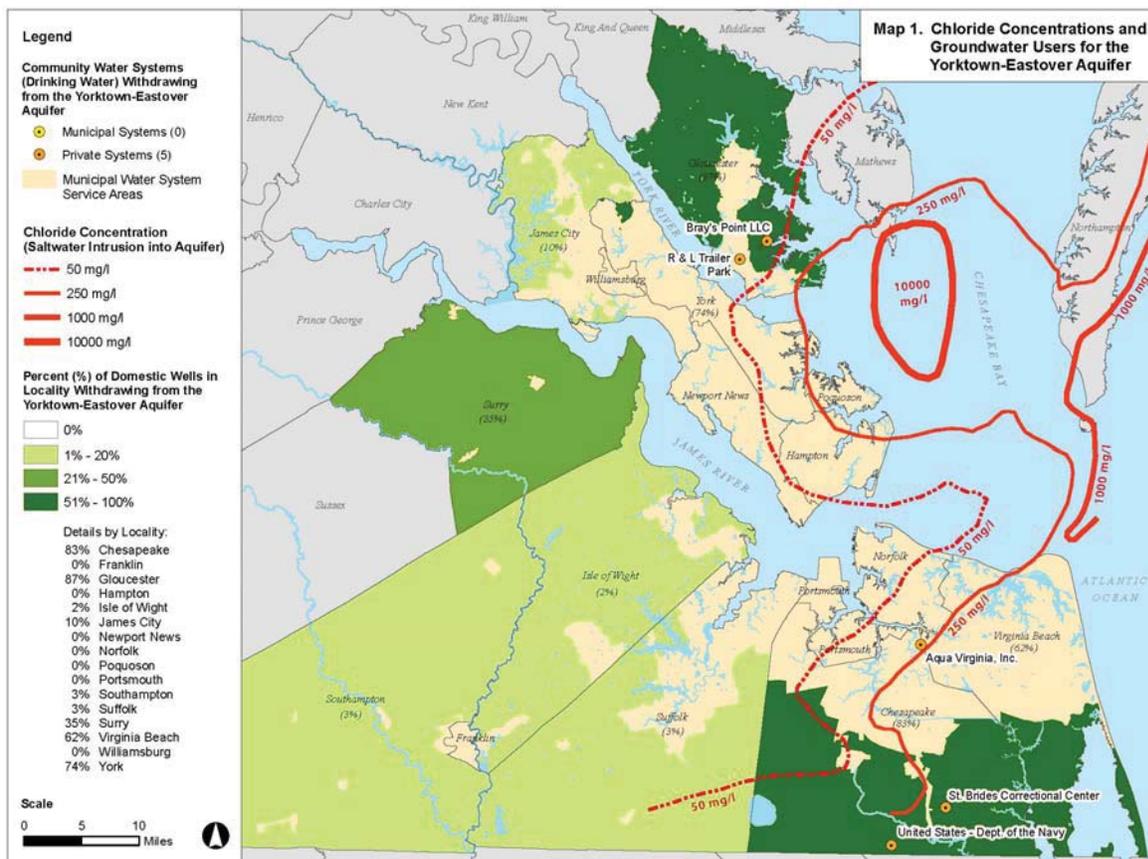
**Water Supply Management:** The current technical evaluation criteria is that the maximum safe supply of groundwater will be preserved and protected for all other beneficial uses and that the applicant's proposed withdrawal will have no significant unmitigated impact on existing groundwater users or the groundwater resource.

These criteria may be too conservative. If they were strictly enforced, homeowners and businesses within the Eastern Virginia GWMA would incur significant costs and might reap little benefit. The regulatory objectives of maximizing the preservation of groundwater, maintaining the same groundwater level criteria throughout the management area, and minimizing salt water intrusion and land subsidence is sensible but does not optimize the use of groundwater resources.

DEQ should consider all aspects of water resource management before reducing permitted groundwater withdrawals. By evaluating the data and findings from the local and regional Water Supply Plans, DEQ could narrow the technical criteria to protect existing and future groundwater users that are most reliant on groundwater. The following research would support DEQ's evaluation of current management objectives and might support additional flexibility in their implementation:

1. Determine the projected water demands in areas with low aquifer capacity/water levels to assess the future need for groundwater availability.
2. Identify the availability of other water sources in geographic areas with low aquifer capacity to assess the value of maintaining groundwater capacity in those areas.
3. Determine the projected water demands in areas susceptible to salt water intrusion to assess the future need for groundwater availability.
4. Identify the availability of other water sources in geographic areas susceptible to salt water intrusion to assess the value of maintaining groundwater capacity in those areas.

The following map of Hampton Roads illustrates item 3 by showing the chloride concentrations in the Yorktown-Eastover aquifer with the existing community systems that have a well in the aquifer and the extent of public water system service areas. Portions of Gloucester County, Mathews County, Chesapeake, and Virginia Beach are where private wells exist near the saltwater interface for this aquifer.



**Summary:** DEQ should focus on data gathering to support a risk based, adaptive approach to groundwater management. Management criteria should transition from 80% criteria applied throughout the Eastern Virginia GWMA to criteria that optimizes the use of groundwater resource and protects communities without alternative water sources. To have an effective program, DEQ will need new monitoring wells and a management approach that integrates water supply planning with both surface and groundwater withdrawal permits.