



EPA Consent Decree  
Annual Informational Meeting  
Integrated Plan/Regional Wet  
Weather Management Plan

January 22, 2019

### Requirements of the Consent Decree

- *“...after providing reasonable notice on its webpage and in a newspaper of general circulation”*
- *“...shall hold an annual informational meeting open to the Localities and the public”*
- *“HRSD shall convey information on the status of the Regional Wet Weather Management Plan, HRSD – Locality cooperation and steps citizens within the Localities can take to protect the receiving waters”*

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## Objective of the Consent Decree

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“HRSD, working in consultation with the Localities, to fulfill the objectives of the Clean Water Act with a goal of eliminating Sanitary Sewer Overflows (SSOs)”



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## Regionalized Approach

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- Consent decree amended to permit a regional approach estimated to save the region \$1 billion over original approach
- Localities and HRSD agreed in Memorandum of Agreement to Regionalized Approach
- HRSD will be responsible for capacity in the regional sanitary sewer system (Localities' systems and HRSD system)
- **MOA modified in 2018 to move HRSD responsibility to plan approval date**

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## Major Change in Compliance Orders

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- Special Order by Consent (SOC) modified in December 2014 focuses on Localities' Management, Operations and Maintenance (MOM) issues
  - Eliminates HRSD from SOC
  - Adds Norfolk to SOC and terminates prior Order
- Consent Decree Modification No. 4 references SWIFT and its relationship with the RWWMP. Requires that the approved RWWMP be a material modification to the CD subject to public comment and Court approval

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## Overall Regulatory Status

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- HRSD continues to implement requirements of Federal Consent Decree, which was originally entered with the court on February 23, 2010, as modified
- **All Consent Decree required submittals have been on time**

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## Rehabilitation Action Plan

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- Requires addressing specific features with condition defects identified in Consent Decree Condition Assessment Program (CAP)
- EPA/DEQ approved the plan in May 2015
- Addresses more than \$183M of required improvements in gravity mains, force mains, pump stations, and associated system components
- Implementation Plan has three phases through May 2025 – Total over \$255 million
  - **Phase 0 - Complete**
  - **Phase 1 (5/2021) – 21% in construction or complete**
  - **Phase 2 (5/2025) – 6 % in construction or complete**

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## Interim System Improvements

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- Consent Decree includes requirement to complete 45 CIP projects totaling approximately \$ 400M.
- All are complete with the final project certification provided to EPA in December 2018.

COMPLETE

# Management, Operations, and Maintenance (MOM) Program

- MOM Program approved by EPA/DEQ in 2011
- **The MOM Program was updated in 2018:**
  - Organizational updates
  - Current programs and updated status of initiatives
- Performance measures are continuing to be tracked to evaluate the effectiveness of the programs

# Consent Decree Performance Measures Review

## Year-over-Year Performance Summary

Metric	Target	FY-12 Actual	FY-13 Actual	FY-14 Actual	FY-15 Actual	FY-16 Actual	FY-17 Actual	FY-18 Actual
Pump Station Annual PM	82*	84	83	83	84	85	87	89
Back-up Generator Annual PM	55	112	81	121	129	129	121	89
Force Main Air Vent PM	1,550	3,096	3,274	3,304	3,486	3,327	3,940	1,881
Non-Invasive Force Main Inspection (LF)	2,400	15,098	2,800	2,562	4,355	2,562	6,375	5,000
Gravity Sewer Inspection (LF)	39,600	72,730	98,185	81,841	89,757	71,595	94,009	40,307
Gravity Sewer Cleaning (LF)	29,400	234,463	207,724	194,838	208,059	190,160	203,206	57,025

\*The Pump Station target became 86 in FY 17 due to new stations coming on line

## HRSD SSOs

Year	# of SSOs	Volume (gal)	# of Unknown SSO Volumes (during wet weather)	Total Inches of Rain near ORF
CY2011	35	1,880,086	13	55
CY2012	40	22,850,543*	6	52
CY2013	14	722,237	2	50
CY2014	29	2,250,915	10	45
CY2015	18	516,704	3	53
CY2016	49**	6,148,239**	23**	69**
CY2017	21	259,057	4	42
FY2018	20	1,006,196	3	47

\*Included single SSO at Wilroy Road of 18,352,000 gallons. Remaining volume ~4,500,000 gallons for 2012

\*\*Included two major weather events in Hurricane Matthew and Tropical Storm Hermine

## Capacity Related SSOs

Calendar Year	Total # of SSOs	Total Volume Of SSOs (gal)	Volume for Capacity (Gals)	# of Capacity SSOs	Named Storm
2011	35	1,880,086	1,409,796	16	Hurricane Irene
2012	40	22,850,543	4,249,483	31	Hurricane Sandy
2013	14	722,237	584,784	5	Remnants of Hurricane Andrea (1)
2014	29	2,250,915	681,392	15	None
2015	18	516,704	207,177	15	None
2016	49	6,148,239	2,133,775	35	TS Julia & Hurricane Matthew
2017	21	259,057	145,221	13	None
2018	20	1,006,196	134,886	10	None

## Submitted to EPA 9/2017

- Plan integrates HRSD obligations under federal consent decree to minimize wet weather overflows with SWIFT to prioritize projects that achieve greatest environmental benefits (i.e., SWIFT)



- Sea level rise and recurrent flooding
- Magnitude and spatial patterns of growth
- Future of numerous major DoD facilities
- Long term trend in I/I
- Regional economic vitality and household income and employment levels
- Regional environmental and public health priorities

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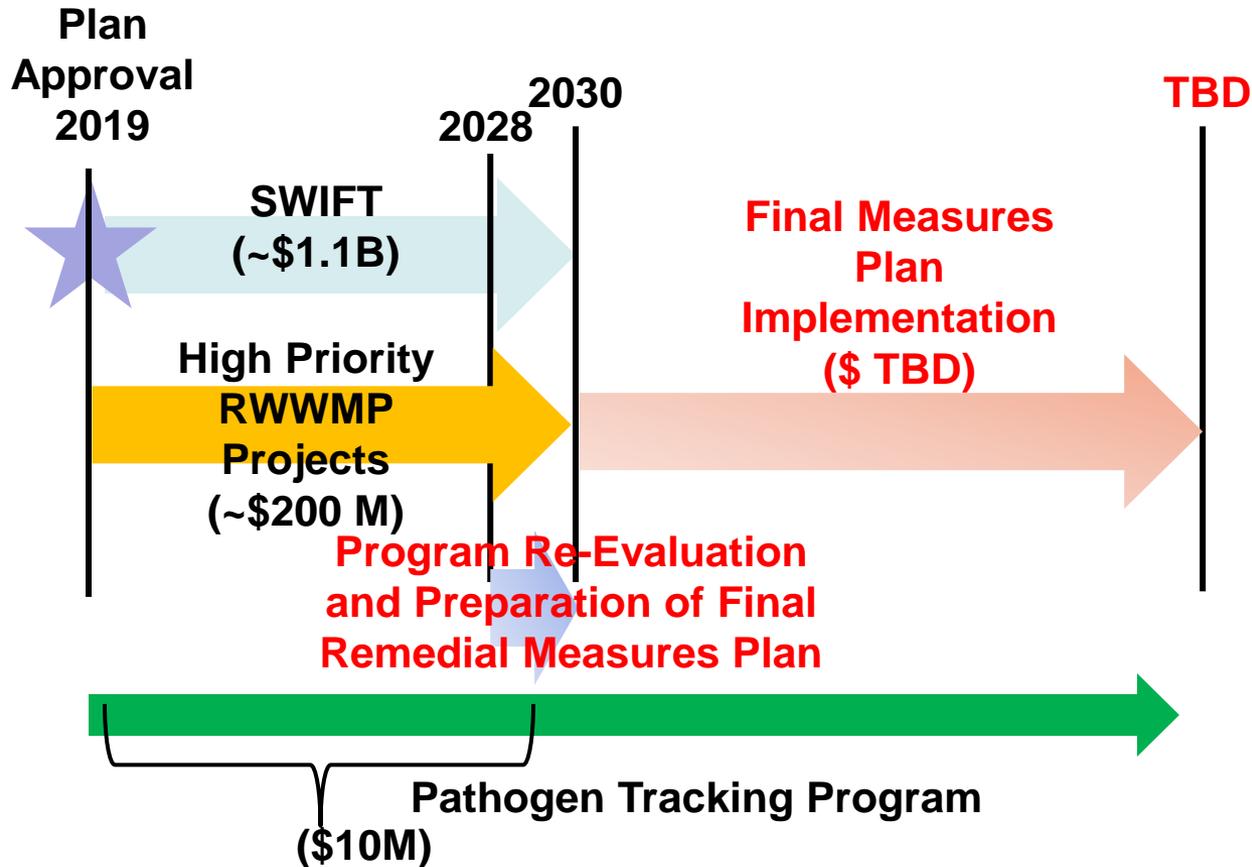
## Adaptive Management Approach

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- Applying iterative decision-making in the face of multiple uncertainties and adjusting the course of solutions in the future to adapt to changing conditions

- HRSD and Localities have entered into nutrient trading agreements to apply SWIFT reductions to stormwater requirements
- Prioritize the projects that provide the highest benefit to human health and the environment
- Allows for appropriate sequencing of projects/programs
- Provides for adaptive management strategies to adjust programs based on results and changing circumstances

# Sequence Places the Greatest Water Quality Benefits First

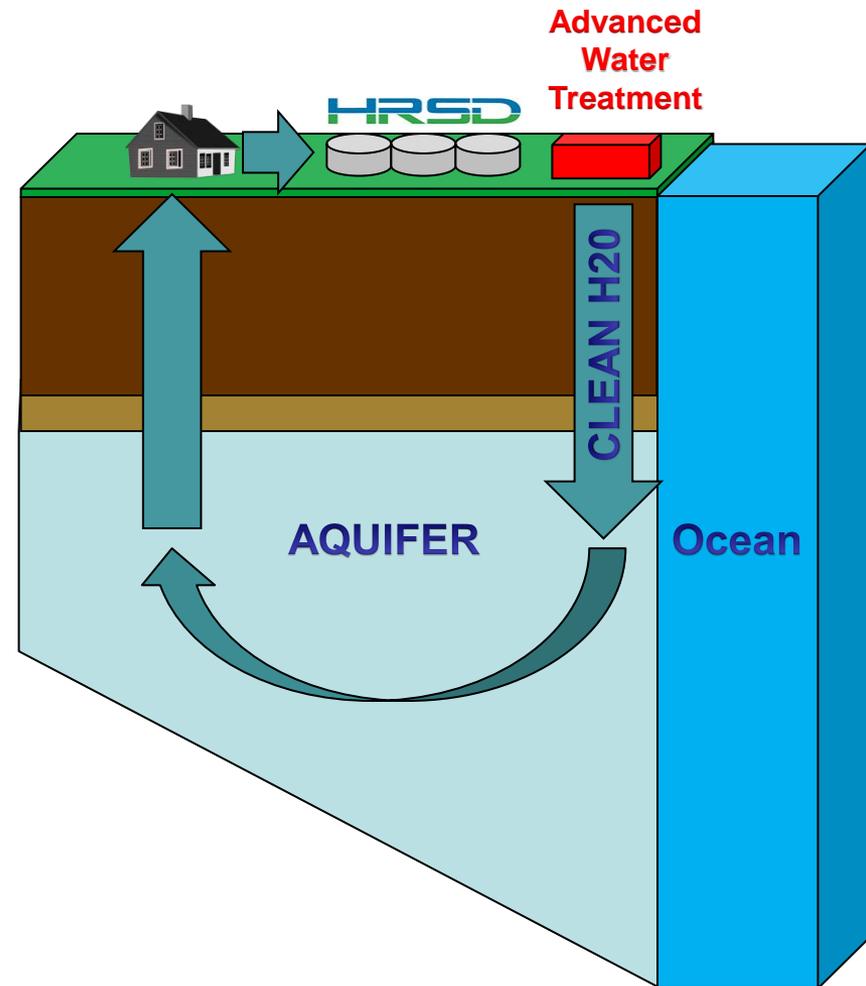


## Regional Integrated Plan – An Adaptive Plan

Phase	Activities	Cost, \$M	Schedule
1	Planning, Condition Assessment, Prompt Repairs, Interim System Improvements, Rehab Action Plan	\$700	2008 - 2025
2	SWIFT and High Priority Projects	\$1,308	2020 - 2030
3	Re-Evaluation and Development of Final Remedial Measures Plan for Priority Capacity Related SSOs	\$2	2028 - 2030
4	Implementation of Final Remedial Measures Plan	TBD	TBD

# SWIFT – Sustainable Water Initiative for Tomorrow

- Treat water to meet drinking water standards and replenish the aquifer with clean water to:
  - Provide regulatory stability for wastewater treatment
  - Reduce nutrient discharges to the Bay
  - Reduce the rate of land subsidence
  - Provide a sustainable supply of groundwater
  - Protect the groundwater from saltwater contamination

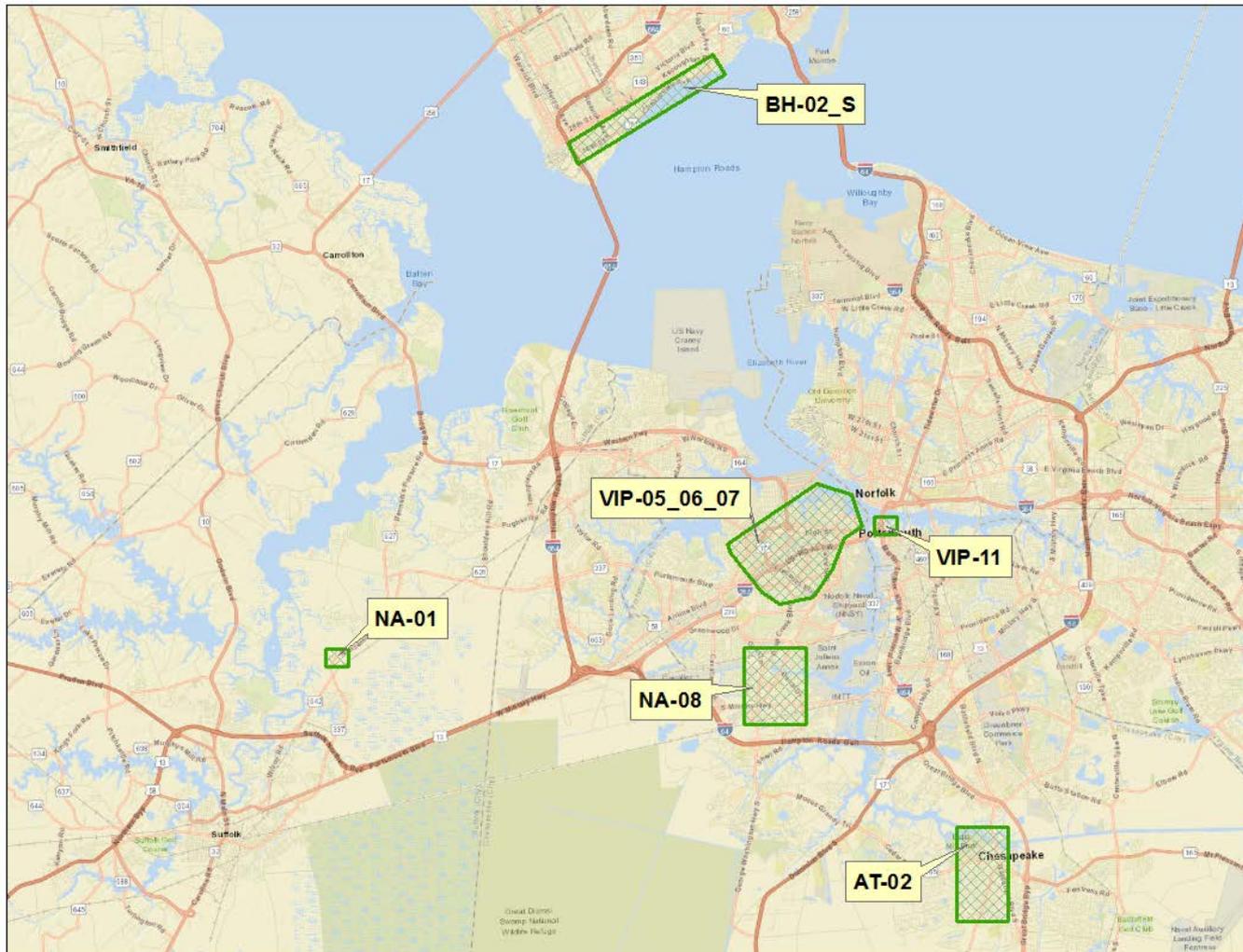




	Pre-SWIFT Daily Total	Estimated Post SWIFT Daily Total	Pre-SWIFT Annual Total	Estimated Post SWIFT Annual Total
Flow (MG)	113.4	12	41,391 (MG)	4,140 (MG)
BOD mg/L (LBS)	4552	455	1.66 M	166 K
TSS mg/L (LBS)	4960	496	1.81 M	181 K
TP mg/L (LBS)	794	79	290 K	29 K
TN mg/L (LBS)	8175	818	2.98 M	298 K

Calendar year 2016 averages

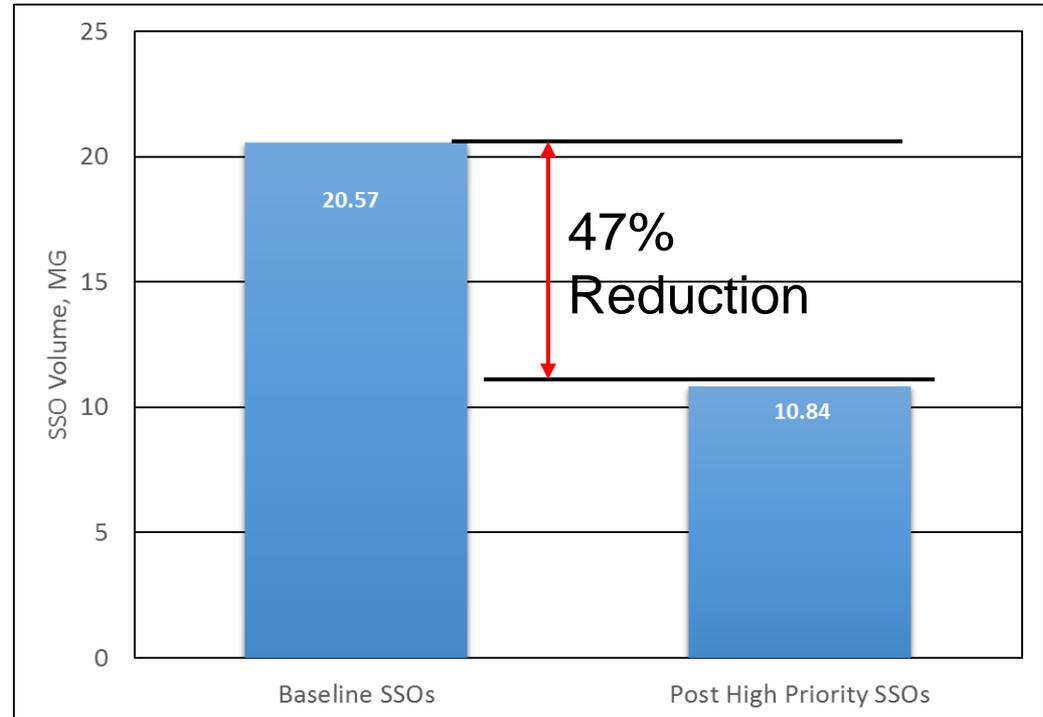
# High Priority Project Areas



# Potential High Priority Project Impact

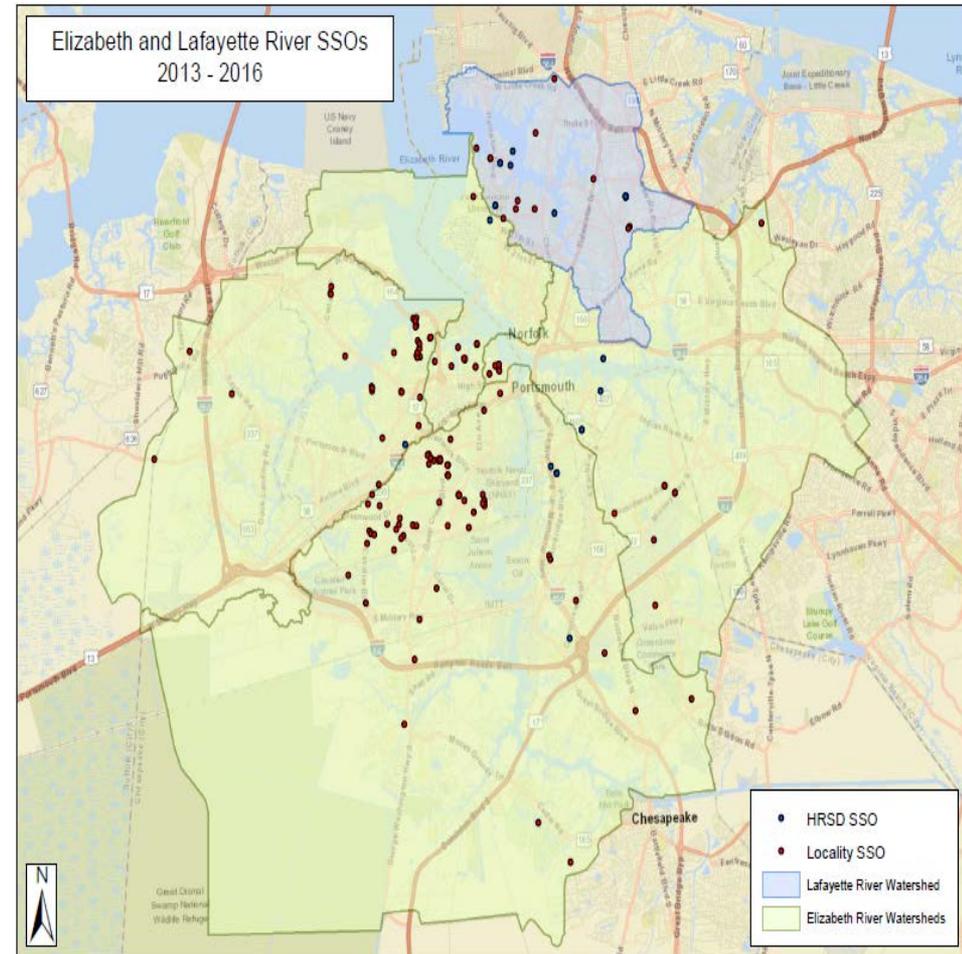
Volume reduction as compared to RHM baseline simulation

- Volume Eliminated 9.73MG
- 47% Reduction to modeled baseline



# Observed wet weather overflows in ER watershed, 2013-2016

- Number of overflows: 172
- 2013: 0
- 2014: 53
- 2015: 0
- 2016: 119



## Number of Days Impacted by Wet Weather Overflows, 2013-2016

- 2013: 0 days with wet weather overflows
- 2014: 4 days with wet weather overflows
  - > 4 inches in 4 hours
  - 1.8 inches in 30 minutes
  - > 3 inches in 12 hours
  - > 5 inches in 24 hours
- 2015: 0 days with wet weather overflows
- 2016: 10 days with wet weather overflows
  - ~ 2.5 inches in 7 hours
  - 3.86 inches of rain over 3 days
  - 2.46 inches of rain
  - 3 days of overflows associated with Tropical Storm Julia (> 10 inches of rain)
  - 4 days of overflows associated with Hurricane Matthew (> 9 inches of rain)

## Water Quality Impacts of SSOs

- Water quality impacts have proven to be short-lived for non-chronic spills (temporally and spatially diverse)
- Post-overflow monitoring consistently demonstrates rapid return to background conditions and compliance with recreational standard when applicable

## Water Quality Impacts of SSOs - Examples

### –Shingle Creek - 2011

- Loss of >18 million gallons in headwater stream
- Returned to background within 5 days of cessation of leak

### –Linkhorn – 2016

- Loss of > 2 million gallons in headwater stream
- Sample results complied with recreational standard within 24 hours of cessation of leak

## SSO Volume in Perspective

DC Water Clean River Program - \$2.6 Billion investment

- CSO volume reported in 2016 1963 MG
- CSO Target at program completion 138 MG/yr

HRSD Wet Weather Management Plan - \$1.8 Billion investment

- SSO volume reported in 2016 6.2 MG
- SSO volume at program completion 1.2 MG/yr\*

\*Modeled overflow volume reduced by 5 MG/yr on average for the 50 year simulation

## Nutrient Impact CSO - SSO

### DC Water Clean River Program

- CSO volume at program completion 138 MG/yr
  - TN 9 mg/ L x 138 MG = 10.4K lbs/year
  - TP 1.9 mg/L x 138 MG = 2.2K lbs/year

### Delay of HRSD Wet Weather Program

- SSO volume during delay +5 MG/yr
  - TN 39 mg/L x 5 MG = 1.6K lbs/year
  - TP 5.5 mg/L x 5 MG = 230 lbs/year

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## Integrated Plan Costs

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- Overall = \$1.816B
  - Wet Weather Capacity Improvements = \$963.7M
  - I/I Reduction Program = \$852.3M
- Scheduled 176 Projects
  - 532 Elements grouped and sequenced w/ hydraulic considerations
- Implementation Timeframe
  - 2020-2030 High Priority \$200M (6 projects)
  - 2020-2030 SWIFT \$1B
  - 2028-2030 Re-evaluate needs and prioritize investments
    - Known wet weather work as of 2017 (\$1.6 B)
    - Sea level rise adaptation \$???
    - Unknown unknown

## Income Quintiles

Quintile	Average Income	Upper Limit	Peak RI, Integrated Plan/RWWMP
Lowest	\$14,183	\$26,219	9.2%
Second	\$36,722	\$47,510	3.5%
Third	\$59,118	\$72,168	2.2%
Fourth	\$89,292	\$109,998	1.5%
Highest	\$176,797	N/A	0.7%
Top 5 Percent	\$185,056	N/A	0.7%

Quintile brackets from ACS 5-Year 2015; MSA: Virginia Beach-Norfolk-Newport News, VA-NC Metro Area (part); Virginia

\$1,302 Peak CPH WW+SW

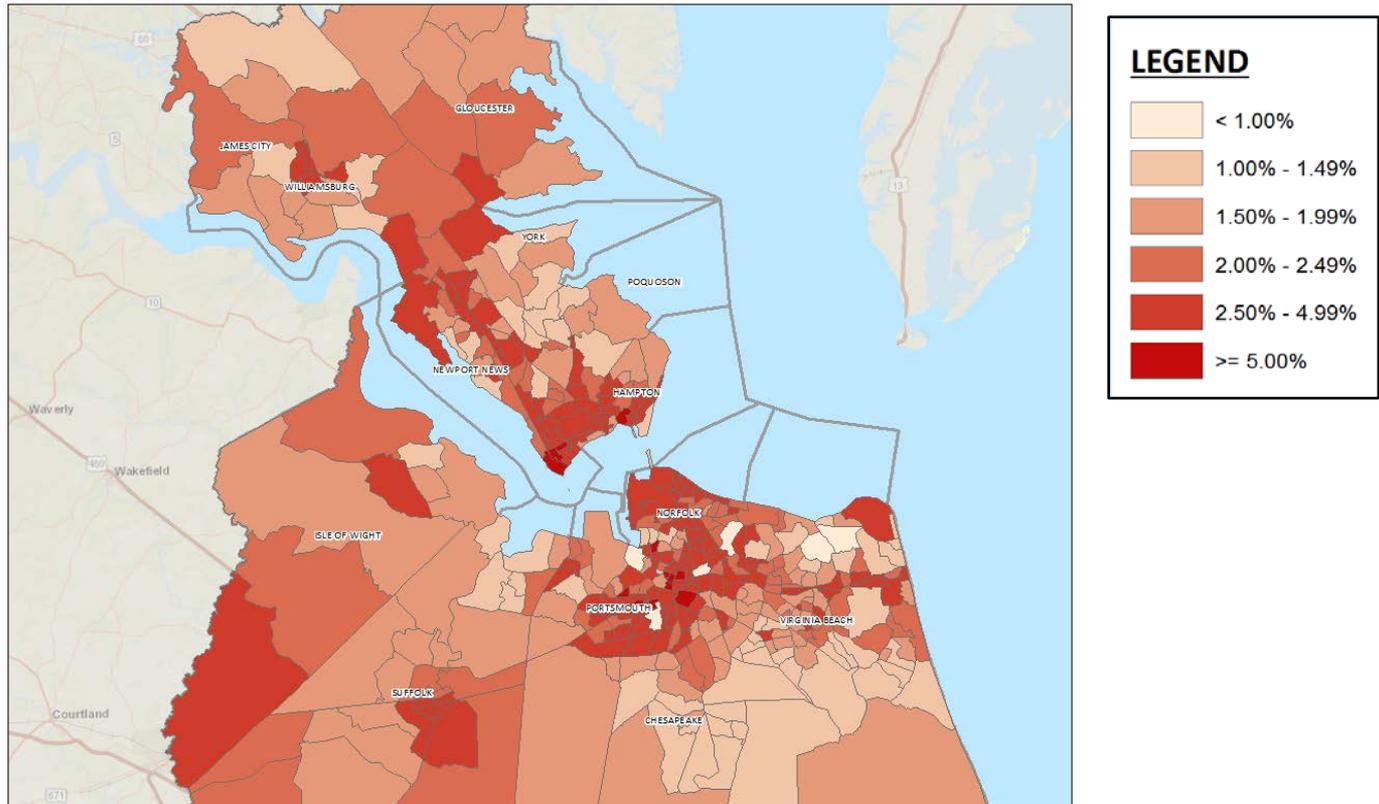
@ Regional MHI: 2.10%

@ Lowest Quintile: 9.18%

# Census Tract Household Utility Cost Burden

- Costs are already high burden for some
- Much broader impact at implementation peak

Peak CPH Wastewater + Stormwater



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## Coordination with Localities

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- Meetings with individual Localities to review capacity enhancements in their systems
- Periodic meetings of Capacity Team
- Monthly Directors of Utilities meetings
- HRSD providing GIS, flow, pressure and rainfall data to Localities
- Ad hoc coordination of bacteria source tracking program

- Annual newsletter published in February 2018 and posted on HRSD.com
- Annual public informational meeting with public notice was held on January 23, 2018

# Steps Citizens Can Take to Protect Receiving Waters

- Report Sanitary Sewer Overflows – Call your local utility department
- Inspect home, yard and sewer service pipes to ensure separation between storm and sanitary systems
- Reduce storm water runoff by using rain barrels, rain gardens and establishing a buffer



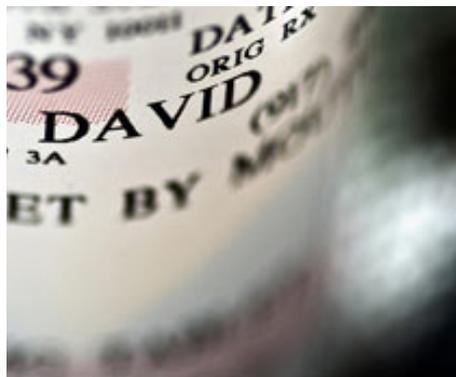
## Steps Citizens Can Take to Protect Receiving Waters

- Pick up animal waste
- Avoid feeding wildlife
- Support “No Dumping” and use boater pump out facilities



## Steps Citizens Can Take to Protect Receiving Waters

- Practice proper disposal of pharmaceuticals, household chemicals, food wastes and kitchen grease – minimize use of or eliminate garbage disposal



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## Steps Citizens Can Take to Protect Receiving Waters

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- Improve water quality by raising oysters
- Plant native plants – minimize groomed turf – managed meadow concept
- Limit fertilizer and other lawn chemical applications – use natural products like compost

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Questions?

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