

## Section 5 | **Water Demand Management**

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## Water Demand Management

Proactive water supply planning utilizes demand management strategies to promote the viability of future water supplies. The localities of Hampton Roads recognize the importance of demand management in water supply planning and development efforts and understand that it is crucial for the region to conserve local water resources and minimize both current and future water demands.

The region's water supply reservoirs have relatively small tributary watersheds and little natural water supply reserve. Most of the surface water in the region is salty and not readily available for drinking water and the groundwater resource is vulnerable to excessive use and saltwater intrusion.

Numerous water resource studies and plans addressing regional water supply needs have been conducted in the past. Based on those studies, Hampton Roads localities are pursuing programs and projects to meet long-term needs while providing interim and drought-related solutions. Incorporating water demand management practices both in the long and short term is a necessary component to extend the useful life of the regional water supply.

Long-term water demand management is practiced through more efficient water use, water conservation, and reductions in water loss. An American Water Works Association (AWWA) questionnaire distributed to 1,000 utility managers asked for the reasons they implement water demand management programs. The most common reason for program implementation was water shortages (see Figure 5-1).

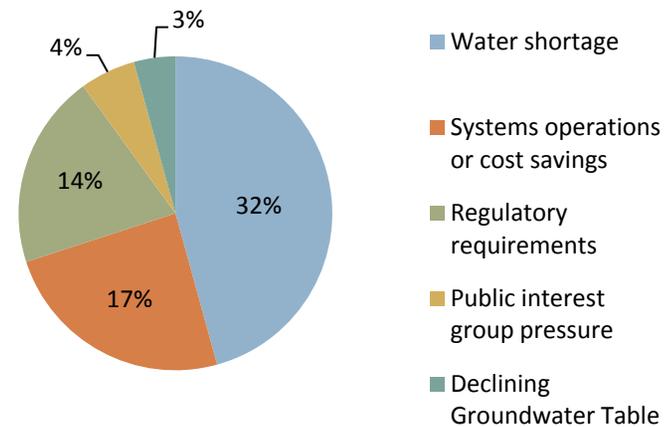
Successful long-term water demand management programs provide additional water supply by lowering overall water demand. Lower long-term water demand provides cost efficient and effective savings by allowing water systems to avoid, downsize, or defer the need for a new water supply source for a number of years.

Short-term water demand management, or drought management, is used during periods of declining water supply and increasing demand. Drought management measures involve many practices

found in long-term water conservation programs along with mandatory water use restrictions, penalties, and rationing.

This section describes water demand management practices in the Hampton Roads region. Long-term water demand management practices are discussed first, followed by a discussion of the Regional Drought Response and Contingency Plan.

**Figure 5-1: Reasons for Implementing Water Demand Management Programs**



Source: AWWA, *Forecasting Urban Water Demand*, p130. 1996.

## Water Demand Management

Water demand management methods and practices allow the region to sustain current and future water needs and conserve water resources. The Hampton Roads region encourages efficient use of water resources by citizens, businesses, and governments alike as one step in enhancing quality of life and economic health.

### Regional Water Conservation History

The Hampton Roads region has been promoting water conservation for almost 40 years. In 1977, the Southeastern Virginia Planning District Commission, which was to become part of the Hampton Roads Planning District Commission (HRPDC), provided an analysis of water conservation techniques which served as a basis for local conservation plans.

Under the Groundwater Management Act of 1992, Virginia manages groundwater through a program regulating water withdrawals in certain areas called Groundwater Management Areas. The Eastern Virginia Groundwater Management Area includes the entire Hampton Roads region except for Gloucester County. Any person or entity wishing to withdraw 300,000 gallons per month or more in a Groundwater Management Area must obtain a permit. All of the Hampton Roads localities except for Virginia Beach, Gloucester County, and Surry County have a permit for Public Water Supply. Each withdrawal permit requires a Water Conservation and Management Plan that includes details on the use of water-saving plumbing, a water loss reduction program, a water use education program, evaluation of potential water reuse options, and mandatory use reduction during water shortage emergencies.

Also in 1992, the *Vegetative Practices Guide* was published by HRPDC. This guide described how vegetation could be used for stormwater management and water conservation. This guide asked homeowners to practice water wise landscaping by thinking beyond

a traditional grass lawn and provided detailed methods for keeping water onsite.

Faced with a water supply shortage and rapid growth, Virginia Beach instituted mandatory water use restrictions in 1992. The Lake Gaston pipeline was dedicated in 1997, fulfilling the need for additional water in southeast Virginia that was projected by the Southeastern Virginia Planning District Commission in 1970.

In early 1993, as a result of the continued water supply shortage, the individual localities and United States military of Hampton Roads began to work together as partners in water conservation. In February 1994, the Hampton Roads Water Efficiency Team (HR WET) was officially established. HR WET brought together water conservation coordinators and public information specialists to create a regionalized approach to public education. HR WET is a regional water efficiency education and outreach organization that includes all Hampton Roads localities and is administered through HRPDC. This regional group hosts a monthly forum focused on improving water efficiency and conservation. The local conservation projects and regional activities of HR WET are detailed in the public education discussion later in this section.

In 1994, HRPDC published a regional Water Conservation Plan with an introduction that stated:

*Conservation and efficient use of this important resource (water) is a critical element of any solution to regional water supply shortages, whether they are long-term or short-term, drought induced. The localities of Hampton Roads recognize the importance of water conservation as an integral component of their water supply development efforts.*

Additionally, the Water Conservation Plan encouraged each locality to pursue a water conservation program with a goal to reduce peak demand and overall per capita water consumption through increased awareness.

The following Hampton Roads Water Demand Management Report highlights successful projects and is not a complete list of regional water conservation actions. Not all conservation programs are a good fit for the diverse localities in the region. However, through sharing conservation program information, each locality has found many successful practices that fit the characteristics of their population and water system.

In 2007, the Hampton Roads localities signed a Memorandum of Agreement for Regional Water Supply Planning. The 24 signature localities include the Cities of Chesapeake, Franklin, Hampton, Newport News, Norfolk, Poquoson, Portsmouth, Smithfield, Suffolk, Virginia Beach, Williamsburg, and Windsor; Counties of Gloucester, Isle of Wight, James City, Southampton, Surry, and York; Towns of Boykins, Branchville, Capron, Courtland, Ivor, Newsoms, Smithfield, and Windsor. Table 5-1 lists the relative size of Hampton Roads public utilities involved in the Regional Water Supply Plan.

The larger localities and public utilities have more comprehensive water demand management programs than their smaller counterparts.

**Table 5-1: 2007 Hampton Roads Public Utilities**

Locality	Population Served	Locality	Population Served
<b>Peninsula Sub-Region</b>			
Middle Peninsula:		York James Peninsula:	
Gloucester County	12,700	Hampton <sup>1</sup>	NNWW
		JCSA <sup>1</sup>	45,836
		Newport News <sup>1</sup>	NNWW
		NNWW <sup>1</sup>	410,000
		Poquoson <sup>1</sup>	NNWW
		York County <sup>1,2</sup>	366
		Williamsburg <sup>1</sup>	13,273
<b>Southside Sub-Region</b>			
Chesapeake	174,586	Suffolk	65,626
Norfolk	235,915	Virginia Beach	403,174
Portsmouth	97,851		
<b>Western Tidewater Sub-Region</b>			
Franklin	9,000	Southampton County	2,328
Isle of Wight County	4,625	Town of Boykins <sup>3</sup>	Southampton County
Town of Smithfield	6,750	Town of Branchville <sup>3</sup>	Southampton County
Town of Windsor	2,300	Town of Newsoms <sup>3</sup>	Southampton County
Town of Claremont	343	Town of Capron	167
Town of Dendron	375	Town of Courtland	1,270
Town of Surry	400	Town of Ivor	395
Note: Surry County does not operate any community water systems. NNWW = Newport News Waterworks JCSA = James City Service Authority 1. NNWW serves Hampton, Newport News, Poquoson, and parts of James City County, as well as parts of York County (as of 2009). 2. York County transferred ownership of the Lightfoot System to NNWW in 2009. 3. The Towns of Boykins, Branchville, and Newsoms are served by Southampton County.			

## Water Demand Management Practices

Water conservation strategies include more efficient water use, reductions in water use, and reductions in water loss. These strategies are discussed below.

### Water Efficiency

Water efficiency utilizes innovative and smart technologies to accomplish the same amount of work while using less water. Table 5-2 summarizes the following water efficiency practices by locality:

- Wasteful water use ordinance;
- Low water use plumbing fixtures;
- Landscaping;
- Water loss awareness; and
- Water reuse

A “Yes” answer in Table 5-2 means that the locality has participated or is still participating in this water efficiency practice. An answer of “Plan,” means that the locality is currently in planning stages of implementing this strategy. Each water efficiency practice is detailed below along with a local program example.

**Wasteful water use ordinance:** An example wasteful water use ordinance from Windsor states, “No person shall permit the water to run from any hydrant, meter, or fixture without proper care to prevent waste.” Many additional localities throughout Hampton Roads have adopted ordinances concerning the waste of water.

**Low water use plumbing fixtures:** In 1987, the State of Virginia General Assembly adopted legislation for low water use plumbing fixtures. The localities of Hampton Roads have adopted these regulations, standards and updates as set forth in the Virginia Uniform Statewide Building Code (VA USBC). The VA USBC has

required low-water-use plumbing fixtures in new construction since 1993.

**Landscaping:** Water demand can be reduced through the use of landscaping which is more water efficient. In James City County, the James City Service Authority (JCSA) encouraged efficient residential landscaping practices by hosting an innovative Landscape Challenge in 2004. JCSA asked homeowners, “What does it take to be water smart?” The winner of the contest applied several water smart principles, including a rain garden, water reuse, mulching, and more to eliminate the need for constant watering while producing a beautiful home landscape.

**Success Story**

In 2006, JCSA teamed up with Housing Partnerships, a non-profit agency that repairs and restores homes for people in need. One selected family received a free landscape makeover along with a refurbished home. Materials and labor were provided from JCSA WaterSmart Partners: Peninsula Hardwood Mulch, STI Turf Care, Williams Landscaping & Design, Meadow Spring Turf, Belden Landscapes, Cooke's Gardens, Ace Hardware, Virginia Cooperative Extension, James City County and Williamsburg Master Gardeners, Turf Love, Housing Partnerships and Harmony Design.

The Waterwise Landscape & Watering Guide is the most requested document that HR WET has produced and published. A water-wise landscape doesn’t mean giving up your lawn or making dramatic changes to your landscape or lifestyle. The guide provides tips on how to water efficiently and lists low water use plants. The Guide was downloaded 8,770 times in fiscal year (FY) 2008 and has been downloaded nearly 20,000 times since originally posted.

Water conservation guidelines may also create more efficient water landscaping. Beginning in 2002, JCSA offered water conservation guidelines for both residential and non-residential development. These guidelines cover water efficient landscaping, irrigation

systems and indoor appliances. To date more than 60 different developments and/or subdivisions have agreed to the guidelines for water conservation.

**Water loss awareness:** Water loss awareness programs are designed for residential water customers and increase knowledge of water loss. HR WET has implemented an educational program to reduce residential water loss using leak detection tablets.

Leak detection tablets are provided to customers to put in the toilet tank to test for a slow water leak. For the period of July 2007 through June 2008, HR WET provided almost 3,000 leak detection tablets with instructions in both English and Spanish to residential customers through local outreach activities taking place at regional demonstrations and events.

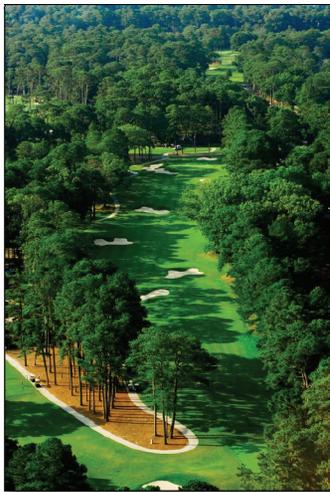
	Wasteful Water Use Ordinance	Low Water Use Plumbing Fixtures	Landscaping	Water Loss Awareness	Water Reuse
Chesapeake	Yes	Yes	No	Yes	No
Franklin	Yes	Yes	Yes	Yes	No
Gloucester County	Yes	Yes	No	No	Yes
Isle of Wight County	No	Yes	No	No	No
JCSA	No	Yes	Yes	Yes	No
NNWW <sup>1</sup>	Yes	Yes	No	Yes	Yes
Norfolk	Yes	Yes	Yes	Yes	Plan
Portsmouth	Yes	Yes	No	Yes	No
Southampton County	Yes	Yes	No	No	Plan
Suffolk	Yes	Yes	Yes	Yes	No
Surry County	No	Yes	No	No	No
Claremont	Yes	Yes	No	No	No
Smithfield	No	Yes	Yes	Yes	Plan
Surry (town)	No	Yes	No	Yes	No
Windsor	Yes	Yes	No	No	No
Virginia Beach	Yes	Yes	No	No	No
Williamsburg	No	Yes	No	Yes	No
York County <sup>1,2</sup>	Yes	Yes	Yes	No	Yes

1. NNWW provides water to Newport News, Hampton, Poquoson, and parts of James City County, as well as parts of York County as of 2009. NNWW Programs are implemented throughout the service area.
2. York County practices applied prior to transfer of ownership of the Lightfoot System to NNWW in 2009. Following system transfer, NNWW practices apply.

**Water Reuse:** The reuse of treated wastewater, or effluent, reduces the demand on water systems. The Hampton Roads Sanitation District (HRSD) was created in 1940 to eliminate sewage pollution in the tidal waters of the Chesapeake Bay. Today HRSD’s wastewater service area includes 17 cities and counties of southeast Virginia and several water reuse projects.

The first permitted industrial water reuse project in Virginia was a public-private partnership between HRSD and Giant Industries, the former York River Western Refinery that was endorsed by Newport News Waterworks (NNWW). The HRSD York River Treatment Plant began delivering 500,000 gallons a day of treated wastewater to the adjacent refinery in July 2002. Prior to closure of the refinery, the project received several awards, including the Water Reuse Association’s 2003 “Outstanding Project of the Year,” and the American Council of Engineering Companies of North Carolina’s 2004 “Honors Award for Engineering Excellence.” HRSD funded the \$3 Million York River project using a 20-year, low-interest loan from the Virginia Water Facilities Revolving Fund.

HRSD also provides 14 million gallons per day (mgd) of effluent to the closed-loop heating and cooling systems of Dam Neck Naval Annex. A 66-inch diameter HRSD line through the Dam Neck Naval Annex transported between 32 to 40 mgd of effluent into the Atlantic Ocean. Following ribbon cutting in October 2008, the Navy began reusing 14 mgd of effluent water as a single pass heat sink, providing more efficient service for about the same cost.



**Photo:** Cavalier Golf Course and Yacht Club, Virginia Beach, Audubon Golf Certified.

HRSD continues to pursue markets for water reuse. With minor additional treatment, reclaimed water can safely replace the high-quality drinking water now meeting the non-potable demands for industry and irrigation. Ideal potential customers include not only industries, but also municipalities, power plants, and others that consistently need large quantities of non-potable water and are located near one of the nine major treatment plants. HRSD evaluates potential water reuse projects on a case-by-case basis in order to reduce long-term demand.

Water reuse projects are also implemented by the localities of Hampton Roads. For example, the City of Virginia Beach has a policy within the Comprehensive Plan to encourage city golf courses to maximize use of recycled water for irrigation instead of groundwater. The plan also seeks full Audubon certification for City golf courses that use recycled water, to use as a means to encourage private golf courses to do the same. This water policy is included in Chapter 9 of the City of Virginia Beach 2003 Comprehensive Plan Policy Document.

**Success Story**  
The City of Norfolk recycles 7,500 tons of water treatment residuals. These residuals are utilized as a soil amendment by local farms. The City also recycles 1.2 million gallons of filter backwash daily.

Gloucester County has sponsored rain barrel making classes for its citizens to learn how they can conserve time, energy and money by using rain barrels. The classes, sponsored by the Tidewater Soil and Water Conservation District, invited all participants to create rain barrels for accessing free water in local gardens. The City of Newport News also hosts rain barrel “make and take” workshops sponsored by the City’s Master Gardeners Association, Department of Public Works, NNWW, and the Virginia Cooperative Extension Office.

Other water efficiency practices applied in the Hampton region include:

**Maximum flow and water consumption rates and quantities of the VA USBC:** The maximum flow and consumption rates are established by the International Plumbing Code, which determines the requirements for plumbing fixtures found in the Virginia Plumbing Code (see Table 5-3).

Plumbing Fixture or Fixture Fitting	Maximum Flow Rate or Quantity
Lavatory, private	2.2 gallons per minute at 60 psi*
Lavatory, public metering	0.25 gallon per metering cycle
Lavatory, public	0.5 gallons per minute at 60 psi
Showerhead	2.5 gallons per minute at 80 psi
Sink faucet	2.2 gallons per minute at 60 psi
Urinal	1.0 gallon per flushing cycle
Water closet	1.6 gallons per flushing cycle

Source: Virginia Plumbing Code. "Design of Building Water Distribution System." Section 604. 2006  
psi = pounds per square inch

**WaterSense:** WaterSense is a water conservation partnership program sponsored by the Environmental Protection Agency (EPA) that can be compared to the Energy Star energy efficiency program. The WaterSense mission is to protect the future of our nation's water supply by promoting and enhancing the market for water-efficient products and services. This program makes it easy for Americans to save water and protect the environment by choosing water efficient products and services. Table 5-4 lists the Hampton Roads WaterSense partners and service providers in November 2008.

**Table 5-4: Hampton Roads WaterSense Partners**

American Water Resources Association	Bill Kennon, Richard Ledvina
Association of State Drinking Water Administrators	National Turf Irrigation, Inc.
Comet Plumbing, Inc.	James Haines
Ferguson Enterprises	Plumbing, Heating, Cooling Contractors National Association
Hampton Roads Water Efficiency Team	A-1 Sewer and Drain, Inc.
JCSA	American Mechanical, Inc.
NNWW	Atomic Plumbing, Heating and Electrical Corporation.
Virginia Beach	D.E. Kirby, Inc.
Virginia Department of Health	East Coast Plumbing and Heating
Water Environment Federation	Ellsworth Plumbing and Heating
Irrigation Association	Evan Hibbs Plumbing
April Showers, Inc	JMM Plumbing & Utilities, Inc.
James Sheshene	Lindsey Brothers Plumbing & Heating
Gentle Rain Irrigation Company	Mechanical Service Co., Inc.
Bill French	Norfolk Plumbing, Inc.
Heads-Up Sprinkler Systems	Ward & Son, Inc.

Source: EPA. *Meet Our WaterSense Partners.*  
<http://www.epa.gov/watersense/partners/partners.htm>. Accessed November 2008

The EPA is actively developing new specifications to expand the WaterSense family such as the Water Budget Tool. This tool is designed to guide builders, landscape professionals, and irrigation partners through water budget calculations for water-efficient single-family new homes.



**Figure 5-2: EPA Water Sense Partner Logo**

**Water Conservation Measures**

Water Conservation measures are used throughout Hampton Roads to encourage people to change behaviors and habits in order to reduce their use of water. Water conservation consists of any beneficial reduction in water losses, waste or use. Water

conservation programs are aimed toward water consumers and can involve technical or financial means and public education programs. Table 5-5 summarizes water conservation practices by locality.

<b>Table 5-5: Water Conservation Practices by Locality</b>								
	Conservation Program	Conservation Ordinance	Install Low Water Use Fixture	Provide Retrofit Kits	Water Pressure Reduction	Irrigation Management	Rebate Programs	Public Education
Chesapeake	Yes	Yes	Yes	No	No	Yes	No	Yes
Franklin	No	Yes	Yes	Yes	No	Yes	No	Yes
Gloucester County	Yes	Yes	No	No	No	No	No	Yes
Isle of Wight County	Yes	No	Yes	No	No	No	No	Yes
JCSA	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes
NNWW <sup>1</sup>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Norfolk	Yes	Yes	Yes	Yes	No	Yes	No	Yes
Portsmouth	Yes	Yes	Yes	No	No	Yes	No	Yes
Southampton County	No	Yes	Yes	No	No	Yes	No	Yes
Suffolk	Yes	Yes	Yes	Yes	No	No	No	Yes
Surry County	No	No	No	No	No	No	No	No
Claremont	Yes	Yes	No	No	No	No	No	Yes
Smithfield	Yes	Yes	No	No	No	Yes	No	Yes
Surry (town)	Yes	No	No	No	No	No	No	Yes
Windsor	No	Yes	No	No	No	No	No	Yes
Virginia Beach	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes
Williamsburg	Yes	Yes	Yes	Yes	No	No	No	Yes
York <sup>1,2</sup>	Yes	Yes	Yes	Yes	No	No	No	Yes

1. NNWW provides water to Newport News, Hampton, Poquoson, and parts of James City County, as well as parts of York County as of 2009. NNWW Programs are implemented throughout the service area.  
 2. York County practices applied prior to transfer of ownership of the Lightfoot System to NNWW in 2009. Following system transfer, NNWW practices apply.

**Technical Practices**

The following information highlights some of the practices for improving regional water conservation using technical means. This includes the use of water conservation programs, ordinances, installation of low water use fixtures, retrofits, system-wide water pressure reduction and irrigation management.

**Water Conservation Program:** Localities throughout Hampton Roads have taken the lead in water conservation by developing and implementing long-term Water Conservation Programs and Plans. These programs reflect the common sense need for municipal water purveyors to manage water supply resources in a responsible and efficient manner and to meet regulatory permit requirements. Short-term water supply Drought Response and Contingency Plans also include water conservation actions and are discussed later in this section. Water Conservation Programs help local utilities provide the most beneficial and cost effective methods of water conservation for their customers.

**Water Conservation Ordinances:** The following five policies are from existing water conservation ordinances.

1. **Car Wash:** All new car wash installations using the public water supply shall be equipped with a water recycling system approved by the Director of the Department of Public Utilities. All existing car wash installations using the public water supply shall install a water recycling system no later than one year from the effective date of this subsection.
2. **Continuous Flow Equipment:** In all new construction and all repair or replacement of continuous flow devices, any water connector device or appliance requiring a continuous flow of 5 gallons per minute or more shall be equipped with an approved water recycling system.
3. **Leak Repairs:** Any owner of any residential unit, commercial or industrial establishment who, by determination of the Director of the Department of Public Utilities, is found to

use an excessive amount of water due to leakage from water lines or plumbing fixtures on the premises shall repair and stop such leakage upon notice from the Department of Public Utilities.

4. **Waste of Water:** No person shall permit water to run from any hydrant, meter, fixture, hose, sprinkler system or any other device without taking such measures as are necessary to prevent waste of the public water supply.
5. **Violation:** Unless otherwise required under VA USBC, this section shall be enforced by the Department of Public Utilities. Any person violating the provisions of this section shall, upon conviction thereof, be subject to a fine.

The following Hampton Roads localities have already enacted a comprehensive water conservation ordinance: Chesapeake, Franklin, Gloucester County, James City County, NNWW, Norfolk, Portsmouth, Smithfield, Southampton County, Suffolk, Town of Claremont, Virginia Beach, Williamsburg, Windsor, and York County. Users of water supplied through a water system where a locality has enacted water conservation regulations must comply with the conservation procedures.

**Installation of Low Water Use Plumbing Fixture:** All newly constructed government facilities in Hampton Roads must meet current VA USBC regulations, which include installation of Low Water Use Plumbing Fixtures. There are many different types of low flow products and fixtures such as toilets, showers, sink faucets and urinals. Hampton Roads government buildings constructed later than 1994 have low water use plumbing fixtures installed.

This type of fixture may also be installed in an older building. In November 2008, the City of Chesapeake completed an energy retrofit project in the 20-year-old City Hall building. The project included heating, ventilation, and air conditioning (HVAC), lighting, and water system retrofits. The water system retrofits included installation of flow restrictors on all faucets, replacement of all

toilets with low-flow designs, and replacement of all urinal flush valves with low-flow kits. The predicted annual water savings is approximately 1.0 million gallons per year, or 45 percent of earlier use. Chesapeake also offered employee training in spring 2009 explaining the City Hall energy retrofit project and what can be done to conserve energy and resources at work and at home.

**Retrofit Kits:** A retrofit kit provides low water use fixtures to water customers at free or reduced prices. Retrofitting involves making improvements to existing fixtures or appliances in order to increase water use efficiency. A retrofit kit may include more efficient shower heads, faucet aerators and toilets. HR WET provided retrofit kits at no charge to localities throughout the region to distribute to local populations.

In March 2000, three localities in the Hampton Roads region, Hampton, Franklin, and James City County, participated in an EPA Environmental Justice Grant administered by HRPDC and HR WET. Using the EPA grant monies, volunteers retrofitted more than 900 lower-income homes with retrofit kits which included 1.6 gallon per minute (gpm) low-flow toilets, showerheads, and faucet aerators. One hundred percent of the old toilets were then recycled and used as base layer materials for an oyster reef in the Chesapeake Bay Watershed. Water fixture retrofitting is also handled through local rebate programs, and covered in the Financial Measures section below.

**Water Pressure Reduction:** Lowering the water pressure of a system improves conservation by reducing the amount of water available for use while maintaining water system integrity and customer service quality. Many local Hampton Roads Utility Departments already utilize the lowest water pressure possible and cannot reduce pressure any further.

The NNWW was able to implement a voluntary pressure reduction in 1986 from a range of 82 to 92 pounds per square inch (psi) to a range of 72 to 82 psi; the lowest level possible. This represents a reduction of about 12 to 16 percent. The pressure reduction lowered

water usage by up to 3 MGD with no action required by the customer. The lower overall water pressure also contributed to a reduction in water loss because there were fewer water system leaks.

**Irrigation Management:** Irrigation management may be used to conserve water through a set watering schedule or irrigation meters. James City County has adopted an ordinance to conserve outdoor water use and reduce irrigation. A 2003 ordinance stated that all customers of the James City Service Authority (JCSA) were limited to three watering days a week throughout the summer season. In 2005, the county adopted an ordinance that stated any automatic irrigation system installed after March 8, 2005 shall include an automatic rain sensor gauge that cuts off water use after one-quarter inch of rain.

The City of Suffolk water utility offers customers the option of irrigation meters. An irrigation meter is an additional water meter which helps to monitor water use and helps local landscape efficiency by increasing customer awareness of outdoor water use. The additional water meter is used to separate interior and exterior water use and lowers the sewer bill. The predominant consumer of this service has been large-volume commercial clients.

### **Financial Practices**

Water conservation can be improved using financial programs. The Hampton Roads program examples are rebate programs and incentives, rate structure and customer water bills.

**Rebate Programs:** A rebate program offers customers a financial incentive to retrofit or replace fixtures and appliances to reduce water use. JCSA has several rebate programs ranging from \$50 to \$500 in value. JCSA initiated the Rain Sensor Rebate Program on July 28, 2005, the Rain Barrel Rebate Program on January 1, 2008, and Rebate Programs for Water Smart landscapes; cisterns; ‘on demand’ hot water re-circulators; and high-efficiency toilet, washing machine, and dishwasher replacements on August 1, 2008. So far there have been 490 approved applications and more than \$40,000 in

customer refunds through the rebate programs. The rain barrel is the most popular with more than half of the approved rebates. JCSA is currently researching grant opportunities to help offset the cost of this successful rebate program.

The Virginia Beach Department of Public Utilities Toilet Rebate Program was started in 1993 and currently offers customers a \$75 rebate for each conventional toilet replaced with an ultra low-flush toilet. An estimated \$3.2 Million has been provided to customers in rebates and more than 42,000 toilets have been replaced throughout the City helping customers save money and conserving millions of gallons of water.

**Rate Structure:** Public Utility water rates may also lead to increased water conservation by water customers. Hampton Roads water utilities use two different rate structures: 1) increasing block rates; and 2) uniform rates. An increasing block rate assigns a single rate per unit of water use until a certain amount, and then the rate per unit increases. A uniform water rate structure charges a constant rate per unit of water use. Water rates may vary throughout the year, typically increasing during the peak outdoor water usage season. NNWW charges an increased block rate for above average water use during the summer. Table 5-6 summarizes local water rate structures. One of the goals of increasing and seasonal water rates is to reduce excessive discretionary water use and encourage customers to monitor water usage. Several local utilities also provide “life-line” assistance for low and fixed income customers.

NNWW studied the relationship of water elasticity, comparing price change to change in water demand. Water use data from 1992 to 2002 were analyzed and over that period there was a 26 percent average increase in the price of water and overall demand reduction of 11 percent. During this period, the basic rate changed from a decreasing block rate to a uniform rate with summer consumption surcharges. A decreasing block rate assigns a single rate per unit of water use until a certain amount, and then the rate per unit decreases. The change in rate from decreasing block to uniform rates with

summer surcharges has significantly contributed to the reduction in per capita water use and water conservation efforts in the region.

**Water Bills:** Water bills throughout Hampton Roads offer customers features beyond basic payment information that help to maximize water customer conservation efforts. Tips to conserve water, comparisons to previous water use, inserts and newsletters containing tips for home water conservation all help improve water demand management.

**Public Education Practices**

Public education is critical to achieving public cooperation and support of water conservation goals. The precise savings attributable to education are hard to quantify, but can produce water savings when customers change their long-term water habits. Experts consider public education to be a key component of an effective multi-faceted water efficiency program.

Increasing Block Rate	Uniform Rate
	Chesapeake
	Franklin
Gloucester County	Smithfield
Isle of Wight County	Norfolk
NNWW*	Portsmouth
James City County	Suffolk
Southampton County	Virginia Beach
Surry County	Williamsburg
	Windsor

\*NNWW provides water to Newport News, Hampton, Poquoson, and parts of James City County, as well as parts of York County as of 2009. NNWW rates are implemented throughout the service area

The Hampton Roads localities have active public education programs. For example in James City County, the JCSA has created *Let's be Water Smart*. This public/private partnership includes a comprehensive water management and education program to help residents maintain high quality landscaping while taking a "smart" approach to water use.

NNWW takes the conservation and water supply message into classrooms and public meetings to explain and educate the community about the need for a sufficient water supply. Programs are presented to students, scouts, civic and church groups. A quarterly customer newsletter provides water-wise advice and tips directly to all NNWW customers throughout the Peninsula.

The City of Norfolk's Department of Utilities offers a variety of public education activities to its customers. Utilities personnel provide classroom presentations to include the water cycle, source water protection and water conservation. Classroom presentations are available for every grade level and are tailored to meet the Virginia Standards of Learning requirements. The Department of Utilities also offers presentations to community groups and civic leagues. Presentations are on the water treatment process, billing procedures, services offered, meter reading procedures, and general Department information; however, all presentations can be tailored to meet the needs of the requesting group. The Department of Utilities also provides displays and distributes Norfolk Pure drinking water for public events. Interested parties can request a classroom visit, presentation, or display from the Norfolk Department of Utilities website.

The Virginia Beach Department of Public Utilities has held an annual Water Awareness Calendar Contest since 1994. There were 829 entries for the 2009 calendar contest from children in kindergarten through fifth grades. In 2008, 6,000 free calendars featuring award winning posters were distributed through the Virginia Beach Public Schools, Public Libraries, and Recreation Centers.

Virginia Beach has contracted with the National Theatre for Children since 1992 to provide water conservation-themed performances in the elementary schools. The slap-stick comedic theater with the recurring theme of *Water Pirates* is designed to be easy to remember as the children progress through school grades. In 2008, 12,129 students attended these theatrical performances.

Water conservation education throughout Hampton Roads is not a burden of a single locality, but a team effort with marketing a regional message through HR WET. HR WET is a committee comprised of local government staff committed to regional water efficiency education to implement a regional approach to communicating the need for water efficient practices by all residents and industries in Hampton Roads.

The HR WET education campaign addresses specific measures and social aspects of enhancing water conservation among water consumers. HR WET conveys to the public an understanding of why water conservation is important and why the combined efforts of thousands of households can significantly contribute to reducing water demand. Monthly HR WET meetings provide a forum for communication, information sharing and collaboration among local government staff. Through the team's focus and dedication, successful programs promoting the efficient use of water throughout the region have been initiated and continue today.

The mission of HR WET is to develop and implement a regional approach to promoting efficient water use throughout Hampton Roads. HR WET has the following goals:

- Raise public awareness of the region's water supplies.
- Reduce per capita water consumption by increasing the number of people using water more wisely.

To achieve these goals, HR WET conducts a comprehensive water conservation education program involving media relations, exhibits, educational resources and an informative website.

**Media:** HRPDC, on behalf of HR WET, contracts with Cox Media for cable television advertising. HR WET ads appear on channels such as WHRO, CW Metro Networks, The Weather Channel, ESPN2, CNBC, MSNBC, HGTV and WVEC Channel-13. WVEC airs *HR WET Water - Use it Wisely* tips during peak viewing times such as The View, Oprah, and Jeopardy.

WVEC Channel 13 scheduled a taping of Dialogue that originally aired on August 27, 2006. Two members of HR WET were interviewed and introduced the *Waterwise Landscape & Watering Guide*. HRPDC staff represented HR WET during the WTBN Channel 21 Joy in Our Town community resources segment and discussed practical ways for viewers to conserve water.

HR WET has also worked with Metro Networks, the region's transportation and traffic radio reporters. Through this partnership, HR WET has been able to deliver live messages about water efficiency to listeners on several radio stations during peak drive times. These spots, along with the television ads, continue to provide reinforcement of the *HR WET Water - Use It Wisely* tagline, "There are a number of ways to save water, and they all start with you."

A one-page tip sheet is used in a variety of regional publications such as the WVEC Channel-13 Hurricane Guide, distributed to the public at local Dodge automobile dealers and made available on the WVEC Channel-13 website. HR WET partnered with HR STORM,

the HRPDC stormwater education program, to develop a joint tip sheet for *The Virginian-Pilot's* Homearama program guide in 2006.

**Exhibits:** The HR WET Team provides demonstrations and events with the HR WET Mobile Educational trailer. The mobile educational trailer is a 21-foot vehicle transported to different Hampton Roads events. HR WET team members distribute educational materials and answer questions from event attendees. The trailer has attended the following events in 2007 and 2008.



Figure 5-3: "Water Use it Wisely" logo

<b>Table 5-7: HR WET Mobile Educational Trailer Events (2007-2008)</b>		
Date	Event	Location
February 2-4, 2007	Home & Garden Show	Hampton Convention Center
March 2-4, 2007	Outdoor 2007	McDonald's Nursery, Hampton
March 16-18, 2007	Good Living Show	McDonald's Nursery, Virginia Beach
April 20, 2007	Earth Day	Legacy Hall, James City County
April 27-29, 2007	History Fest	Oceanfront, Virginia Beach
May 6, 2007	Earth Day	Mt. Trashmore Park, Virginia Beach
May 17-20, 2007	Chesapeake Jubilee	Chesapeake City Park
June 2-3, 2007	Relay for Life	Dam Neck, Virginia Beach
June 6, 2007	Employee Safety Day	City of Norfolk
September 7-9, 2007	Hampton Bay Days	Hampton
September 22, 2007	Estuaries Day	York River State Park, Williamsburg
October 27, 2007	Virginia Fall Classic	Newport News City Park
February 8-10, 2008	Home and Garden Show	Hampton Convention Center
March 7-9, 2008	Cox Food & Flower Show	McDonald's Nursery, Hampton
March 29-30, 2008	Daffodil Festival	Gloucester
April 26, 2008	Earth Day Celebration	Christopher Newport University
May 4, 2008	Earth Day Celebration	Virginia Beach
May 7, 2008	Drinking Water Week	Newport News / Hampton
May 15-18, 2008	Chesapeake Jubilee	Chesapeake
June 7-8, 2008	Relay for Life	Virginia Beach
June 27-28, 2008	Olden Days	Smithfield

**Educational Resources:** HR WET participated in the creation of the Newspapers in Education *We All Live on the Water* newspaper distributed to almost 25,000 Hampton Roads third grade students. The paper was partially funded by a grant from the Chesapeake Bay License Plate Fund. *We All Live on the Water* helped to educate regional youth about local watershed information and included a Teacher’s Guide correlated to the Virginia Department of Education Standards of Learning requirements.

Through the HR<sup>4</sup> Mini-Grant Program, schools and youth groups are eligible to receive up to \$500 toward environmental projects that meet the goals of HR CLEAN, HR STORM, HR FOG and HR WET; \$6,714 in grant funds were provided to different groups and more than 7,000 Hampton Roads youth were reached.

As part of the education program, HR WET orders and distributes a variety of promotional giveaways that encourage water efficiency. Magnets, post-it notes, stickers, toothbrushes, shower timers, and rain gauges with the *Water - Use It Wisely* logo are just some examples of the many educational items distributed by HR WET. Recently, team members developed a dry-erase board with popular water conservation tips and images. Some additional giveaways have been:

- *Waterwise Landscape & Watering Guide* 6-inch ruler that converts water faucet drip size to flow rate in gallons per minute
- Sponge in the shape of a *Water – Use it Wisely* water drop

Another component of the regional education program is the HR WET website, [www.hrwet.org](http://www.hrwet.org). From the website, users are able to download and print information, apply for a HR<sup>4</sup> Mini-Grant, e-mail local representatives and more. The website also provides indoor and outdoor conservation tips, water efficiency techniques and procedures for conducting a home water audit. The HR WET website is enhanced and updated frequently with information received from team members and staff. For additional visibility, the HR WET site has been linked to many regional municipal websites.

HR WET is focused on the education of all local citizens, including youth and businesses, on the need for water efficiency and conservation. HR WET continues to develop and provide the region of Hampton Roads with programs promoting efficient water use and ways to reduce the per capita water consumption by teaching people how to use water more wisely.

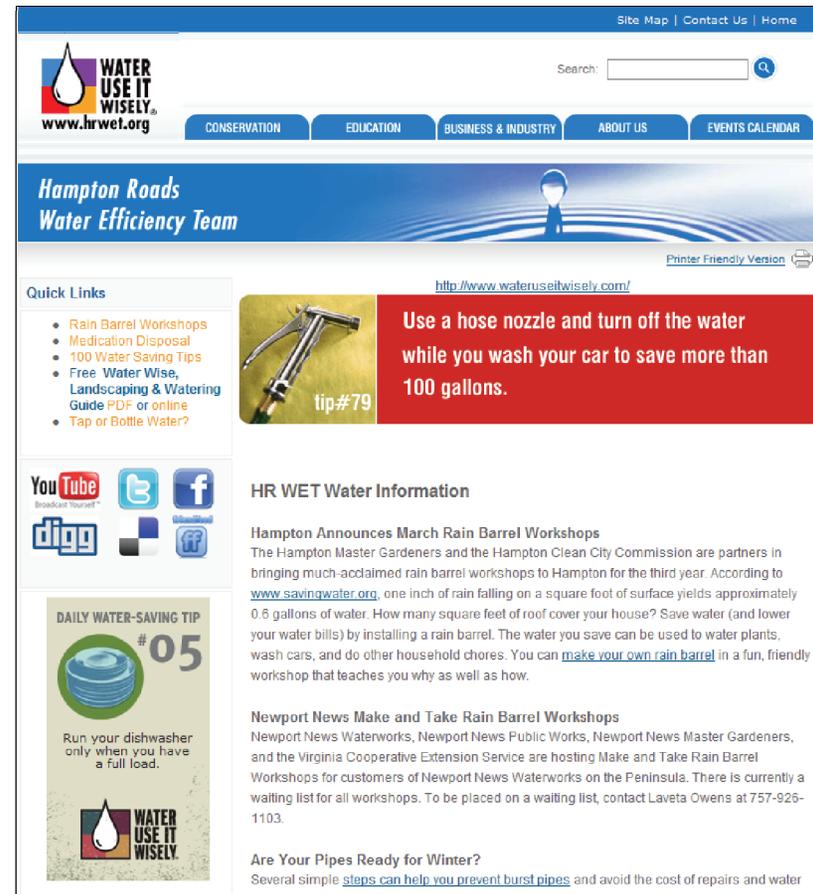


Figure 5-4: HR WET website

**Reducing Water Loss**

Water conservation practices begin with water supply systems. Hampton Roads regional water providers are working to reduce leakage within their systems and unbilled water loss. Leakage within the water system is reduced or eliminated through system maintenance. Unbilled water loss is water use that is unmetered or unauthorized. Table 5-8 summarizes local practices to address water loss.

**Practices to Reduce System Water Loss**

Leakage within the water system, also called real water loss, occurs when water exits the system without metering and can be lessened through water system maintenance and local ordinance.

**Repair of Leaking Fixtures Ordinance:** Many localities throughout Hampton Roads have adopted a Repair of Leaking Fixtures Ordinance. This ordinance requires repairs to leaking water fixtures within a reasonable period of time. Virginia Beach ordinance 37-20 reads:

*No person shall permit the water to run from any hydrant, meter, cock or fixture without proper care to prevent waste. If any pipe, hydrant, meter, cock or other fixture is found leaking, the owner of the premises shall have the necessary repairs made immediately upon notice from the department of public utilities to do so, and failure to repair shall require the discontinuance of the water supply until repairs are made.*

**Capital Improvement Plans (CIP):** Local governments approve CIPs that provide blueprints for spending. CIP programs often include dedicated funding to upgrade existing facility infrastructure and help to reduce water loss. Most localities in Hampton Roads have CIPs that provide funding for water systems. As an example, the Norfolk Department of Utilities builds, maintains, and improves the City’s water and sewer systems. These systems include a vast network of pipes, pump stations, treatment plants, and storage

facilities. Norfolk’s water system has one of the lowest leak rates in the industry. Although both systems currently work sufficiently to provide water and sewer services, the City’s goal is to be proactive to provide the best service possible. From 2004-2013, Norfolk is committed to spending \$170 million for water system improvements.

**System Maintenance:** Maintaining water systems by replacing old lines, system rehabilitation, improving leak detection and repair will help reduce water loss and lower water demand. For example, the City of Franklin has an active program of replacing undersized and older pipelines throughout the distribution system. The number of leaks per unit pipe length, age, work orders, cost for replacement, and reports of inadequate pressure are factors that determine replacement priority. This program has proven effective in reducing system leaks and improved fire protection capabilities by increasing flow to the fire hydrants. The City of Franklin has also improved the overall response time to line breaks and leaks, which provides an additional component of water conservation efforts.

**Leak Detection Program:** A local program that can detect water leaks quickly may lower the total amount of water loss. Water lost to leaks produces no revenues for the utility and should be minimized. The City of Norfolk has had a leak detection program in place since 1980. A two-person crew surveys the City with listening equipment that enables them to track down all but the smallest leaks. They also respond to requests from meter mechanics to check for leaks in suspected locations. Water main breaks

Success Story

The City of Norfolk Department of Utilities was awarded Commitment Level River Star status by the non-profit Elizabeth River Project. The Elizabeth River Project’s River Stars program is one of the most successful local pollution prevention and habitat restoration programs in Virginia. The Department of Utilities was awarded this status for their multiple efforts in energy conservation, recycling, water and sewer leak prevention and employees awareness programs.

are repaired immediately. Top priority is assigned to service line leaks, with a goal to repair any leaks within 24 hours of notice. Norfolk also has a number to report leaks and maintains a 24-hour stand-by crew for responding to any water emergency.

Several localities also have automated systems to report high water bills, which could be due to leaks. Norfolk customers can call the utilities department high bill and leak reporting system, and they will investigate the situation within two business days.

**Table 5-8: Practices by Locality to Reduce Water Loss**

	Leaking Fixtures ordinance	Water CIP Projects	System Maintenance	Leak Detection Program	Unauthorized Connection Ord.	Metering of All Uses	Meter Testing, Replacement	Residential Water Audits
Chesapeake	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
Franklin	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Gloucester County	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Isle of Wight County	No	Yes	Yes	Yes	Yes	Yes	Yes	No
JCSA	No	Yes	Yes	No	Yes	Yes	Yes	No
NNWW <sup>1</sup>	No	Yes	Yes	Yes	Yes	Yes	Yes	No
Norfolk	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Portsmouth	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Southampton County	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Suffolk	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Surry County	No	Yes	Yes	No	No	Yes	Yes	No
Claremont	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
Smithfield	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Surry (town)	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Windsor	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Virginia Beach	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Williamsburg	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
York <sup>1,2</sup>	Yes	Yes	Yes	No	Yes	Yes	Yes	No

1. NNWW provides water to Newport News, Hampton, Poquoson, and parts of James City County, as well as parts of York County as of 2009. NNWW Programs are implemented throughout the service area.
2. York County practices applied prior to transfer of ownership of the Lightfoot System to NNWW in 2009. Following system transfer, NNWW practices apply.

NNWW currently has a system leakage rate of 5 percent, one of the lowest rates in the industry. The industry average for water loss is between 12 and 15 percent. Through an aggressive water conservation program, NNWW was able to reduce water loss from 5.6 MGD in 1993 to 1.3 MGD in 1999. NNWW credits the strong educational program, metering of uses, pressure reduction and leak repair in helping to reduce the amount of water loss.

**Practices to Reduce Unbilled Water Loss**

Metering problems and customer water use that is unauthorized are examples of unbilled water loss. The following methods are used in Hampton Roads to lower unbilled water loss: unauthorized connection ordinance, increasing the numbers of customers that have metered water connections, meter testing and replacement programs and residential water audits.

**Unauthorized Connection Ordinance:** Localities throughout the Hampton Roads region have ordinances declaring unauthorized connections to water lines unlawful. These ordinances may lower the overall amount of water loss. Ordinance 90-127 from Suffolk states:

*No person, except one properly authorized by the city, shall tap or make any connection with the main or distributing pipes. No person, except a licensed plumber or an employee of the city approved by the city for such purpose, shall be permitted to do any work in connection with the water service to any premises supplied by the city.*

**Metering:** Accurate water metering is a fundamental tool of water system management and conservation because a working meter prevents water loss. All Hampton Roads water suppliers use service connection metering to inform customers about how much water they are using and accurately track water use. In 1975, the Southeastern Water Authority of Virginia made the following statement about water metering which remains accurate today,

*Timely information on water use must be available in order to establish normal consumption patterns, adjust rates, identify trends and make reliable projections, and detect*

*accidental losses as well as wasteful tendencies. The very presence of meters and monitoring policies would generally tend to discourage waste.*

**Meter Testing and Replacement:** All meters should be regularly tested for accuracy and replaced when needed. Meters can become damaged and they deteriorate with age. In the City of Norfolk, meters are replaced for residential customers after 15 years of use. Meters for wholesale customers are calibrated annually and replaced if necessary.

Success Story

The Hampton Roads region has been actively conserving water with proven results. The regional per capita water use has lowered dramatically, from 116.4 gallons per capita per day in 1990 to 97.6 gallons per capita per day in 2007.

Future improvement in lowering per capita usage will be more difficult because of water demand hardening. Demand hardening occurs as the discretionary use of water diminishes, leaving only necessary water use; which is more difficult to reduce. While water conservation may be difficult in the future, it remains a priority for Hampton Roads.

In 2000, Maddaus Water Management provided a water conservation analysis for the Peninsula Cities of Newport News, Poquoson, Hampton, Williamsburg, James City and York Counties. Water demand for the Peninsula leveled off in the mid 1990s, despite an annual 1.4 percent increase in the number of water customers. The study also found an overall 21 percent decline in total consumption per active account from the mid 1980s to 2005 due to aggressive water conservation programs such as summer conservation rates, water pressure reduction, distribution system improvements, regional and local water efficiency education programs, leak detection and meter calibration.

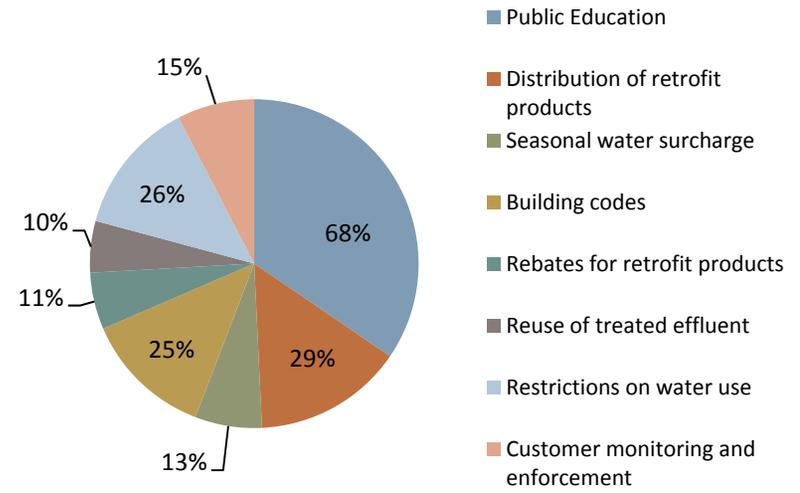
**Residential Water Audits:** Audits can help customers to improve their water usage habits and avoid high water bills by demonstrating water usage habits. Virginia Beach has a program that automatically includes a special insert in a customer bill when the usage spikes without explanation. The insert offers the customer a free water audit to find out if the problem is system based or from overuse. If the water audit finds that the problem was due to a system leak, the customer is credited for a portion of the bill once repairs have been made. The customer is also provided with lessons on water conservation practices if the overage is due to excessive water use.

**Water Conservation Summary**

Hampton Roads recognizes water conservation is an integral component of water supply development efforts. AWWA identified the most popular water conservation programs across the United States (see Figure 5-7). All top eight water conservation programs are currently implemented within Hampton Roads, demonstrating the continuing regional commitment to water conservation.

Hampton Roads water demand management practices are regularly reviewed and evaluated for effectiveness. Local water demand management programs are updated based on the feasibility, cost-effectiveness, conservation measures already in place, and water use required for human health and sanitation. Per 9 VAC 25-780-110B, regional water conservation practices were considered when projecting long-term water demands presented in Section 4 of this plan. Improving water efficiency, increasing water conservation, and reducing water loss are practices necessary to ensure the viability of water supplies across the region.

**Figure 5-5: Top U.S. Water Conservation Programs**



AWWA. Forecasting Urban Water Demand. p130. 1996.

## **Regional Drought Response and Contingency Plan**

The Hampton Roads Regional Drought Response and Contingency Plan addresses the requirements set by the State of Virginia Local and Regional Water Supply Planning regulation (9 VAC 25-780). The purpose of a drought management plan is to manage a period of declining supply and increasing demand so that demand does not exceed either supply or system capacity.

The region's vulnerability to drought has long been recognized. Drought conditions previously occurred in 1977, 1980-81, 1986, 1993, 2002, and 2007. During past drought events, several localities in the region implemented water restrictions.

In 2007, the Hampton Roads localities signed a Memorandum of Agreement for Regional Water Supply Planning. The 24 signature localities include the Cities of Chesapeake, Franklin, Hampton, Newport News, Norfolk, Poquoson, Portsmouth, Suffolk, Virginia Beach and Williamsburg; Counties of Gloucester, Isle of Wight, James City, Southampton, Surry, and York; Towns of Boykins, Branchville, Capron, Courtland, Ivor, Newsoms, Smithfield, and Windsor. All of the listed localities are included in the Hampton Roads Drought Response and Contingency Plan.

The Hampton Roads localities have completed many successful regional efforts that address water use, source water protection, and water supply issues. The HRPDC Source Water Assessment Program (HRPDC SWAP), the regional water conservation education program (HR WET), and the groundwater, stormwater, and wastewater management programs are a few examples of regional cooperation in water resources management.

Local governments operate all of the large community water systems in the region. Drought response planning in Hampton Roads is led by the Utility Departments of the local governments. The Directors of the Utilities began meeting monthly in the summer of 1993, as part of the HRPDC water program and continue their meetings today.

The Directors of Utilities Committee meeting provides an opportunity for water providers to discuss their concerns and actions related to drought or emergencies. Every Hampton Roads locality is represented on the Directors of Utilities Committee and water supply is a monthly discussion topic.

The interdependence among all of the localities in terms of water supply creates an opportunity to approach many regional water problems with a regional or subregional solution. The Hampton Roads Drought Response and Contingency Plan is structured to address the variety of water sources that are utilized in the region and enhances established local drought management policies. Individual ordinances and reports described in the next section document the drought response planning that local governments have already adopted. Nothing in this plan should be viewed as limiting local governments or waterworks from taking more stringent actions to respond to local conditions at any time.

### **Water System Relationships**

The following section defines the sub-regions and the relationships between the localities in each sub-region. Because many of the water providers serve multiple localities, agreements have been established to coordinate the implementation of drought response policies. The three sub-regions are the Peninsula, Southside, and Western Tidewater.

#### **Peninsula Sub-Region**

The Peninsula sub-region includes Gloucester County on the Middle Peninsula, and James City County, York County, and the Cities of Hampton, Newport News, Poquoson, and Williamsburg on the York-James Peninsula (see Figure 5-6).

Gloucester County is located on the Middle Peninsula and the County's water supply system is not tied into any of the other systems in the sub-region. Gloucester's reservoir and the Newport News reservoirs generally experience the same precipitation rates and the localities benefit from sharing information about their drought concerns.

**Figure 5-6**  
**Peninsula Sub-Region**



NNWW owns and operates the majority of the water supply resources and distribution systems on the York-James Peninsula. NNWW serves over 400,000 people in Hampton, Newport News, Poquoson, and portions of York and James City Counties.

The NNWW Acts of Assembly enabling legislation was signed by the Virginia General Assembly on March 25, 1926. This legislation authorized the City of Newport News to purchase the Newport News Light and Water Company and:

*...operate, control, extend and improve said plant for the purpose of supplying water to the inhabitants of York County, James City County, Warwick County, Elizabeth City County, the City of Hampton, the Town of Phoebus, the village of Kecoughtan and certain areas and properties owned by the United States. (Virginia Assembly 880)*

This legislation allowed NNWW to become the water supplier for the City of Hampton. The City of Poquoson incorporated from York County in 1952 and became an independent city in 1975. Poquoson continues to use NNWW for its water supply. All water for the cities of Newport News, Hampton and Poquoson is supplied by NNWW.

Williamsburg Public Works provides water service to all of Williamsburg and a portion of York County. JCSA has over 45,000 customers who are served by multiple groundwater systems. Williamsburg and the JCSA have both signed Long-term Water Supply Agreements with NNWW. James City County has a contract with NNWW to provide supplemental water of 4 to 5 MGD to the County groundwater supply until water from a new water supply project is available. Williamsburg has a contract with Newport News to purchase up to 2.0 MGD.

The Long-term Water Supply agreements between Newport News and James City County and Williamsburg describe the implementation of water use restrictions. The long-term agreement states, that if conditions such as drought or other emergencies cause the federal government, Commonwealth of Virginia, or City to impose or enact water use restrictions on its water system customers,

then JCSA and Williamsburg and their customers will also be subject to the same restrictions which will be imposed and enforced by JCSA and Williamsburg. Bound by these agreements, Williamsburg and James City County are obligated to follow the drought management plan of Newport News. However, either local government can enact more stringent drought plans than Newport News at any time.

York County currently is served by NNWW and Williamsburg directly and also by several private community water systems. The private water systems buy water from York County master meters, and York County buys the finished water from NNWW or Williamsburg. As they are within the NNWW service area, York County customers must follow water restrictions imposed by NNWW. Also, York County's ordinance states that the water conservation program shall generally be in accordance with the program requirements of the Newport News City Council.

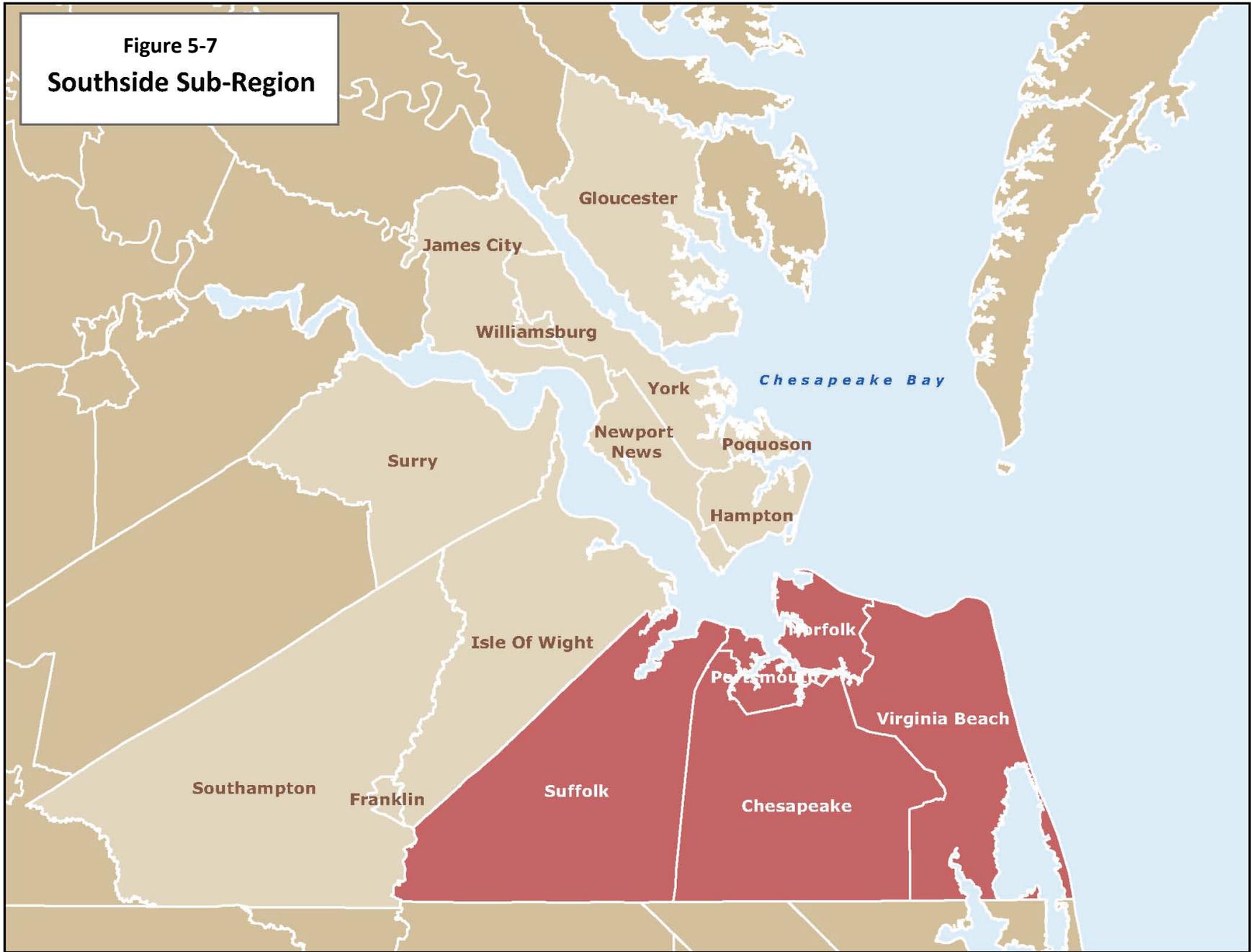
For the purpose of the Regional Drought Response and Contingency Plan, NNWW represents customers in several localities. The cities of Newport News, Hampton, Poquoson, Williamsburg, and York County will generally follow the drought management restrictions set by NNWW and are all represented in this plan by NNWW. JCSA will at a minimum follow the lead of NNWW, but may set more stringent standards based on its groundwater system.

### **Southside Sub-Region**

The Southside sub-region includes the Cities of Norfolk, Portsmouth, Virginia Beach, Chesapeake, and Suffolk (see Figure 5-7).

The City of Norfolk provides water to its entire City and is contracted to provide water to several other localities. Under an existing cost of service contract, Norfolk "wheels and treats" water for the City of Virginia Beach's publicly-owned CWS. Lake Gaston water, owned by Virginia Beach, is piped to Norfolk's Lake Prince reservoir system. The Lake Gaston water and water from Norfolk's water sources are blended and treated at Norfolk's Moores Bridges Treatment Plant and Norfolk's 37th Street Treatment Plant.

**Figure 5-7**  
**Southside Sub-Region**



Norfolk sells finished water and raw water to the City of Chesapeake's publicly-owned CWSs and, beginning in 2014, will also sell raw water to the Western Tidewater Water Authority. Norfolk has a contract to sell raw water to Portsmouth for drought and emergencies. The City of Norfolk provides water service to the military installations located in Norfolk and Virginia Beach: Norfolk Naval Base, Fort Story, Little Creek, Oceana Naval Air Station, the Dam Neck Annex, and Camp Pendleton. Norfolk also provides water for fire protection to the Navy at Craney Island.

Portsmouth sells bulk, treated water to Suffolk and Chesapeake. Portsmouth provides direct water service to the northwest portion of Chesapeake. Portsmouth provides water to the Norfolk Naval Shipyard and the Naval Medical Center. Suffolk provides water to the U.S. Joint Forces Command installation.

Since all of the localities in the Southside sub-region have one or more agreements with other localities in the sub-region regarding water supplies, they have coordinated drought responses in the past and plan to continue to work together.

**Western Tidewater Sub-Region**

The Western Tidewater sub-region includes the City of Franklin, Isle of Wight County, Southampton County, Surry County, and the incorporated Towns of Smithfield, Windsor, Claremont, Dendron, Surry, Capron, Courtland, Ivor, Boykins, Branchville, and Newsomes (see Figure 5-8). In Western Tidewater, the community water systems are much smaller than in other parts of the region and the localities rely on groundwater sources.

Isle of Wight and Suffolk formed the Western Tidewater Water Authority (WTWA), which holds a groundwater permit for a portion of their supplies. In 2014, WTWA will begin purchasing raw water from the City of Norfolk.

The City of Franklin provides water service to the entire city and sells 200,000 gallons per day (gpd) of water to Isle of Wight County. Southampton County Waterworks provides all water service to the towns of Boykins, Branchville, and Newsoms. The three towns of

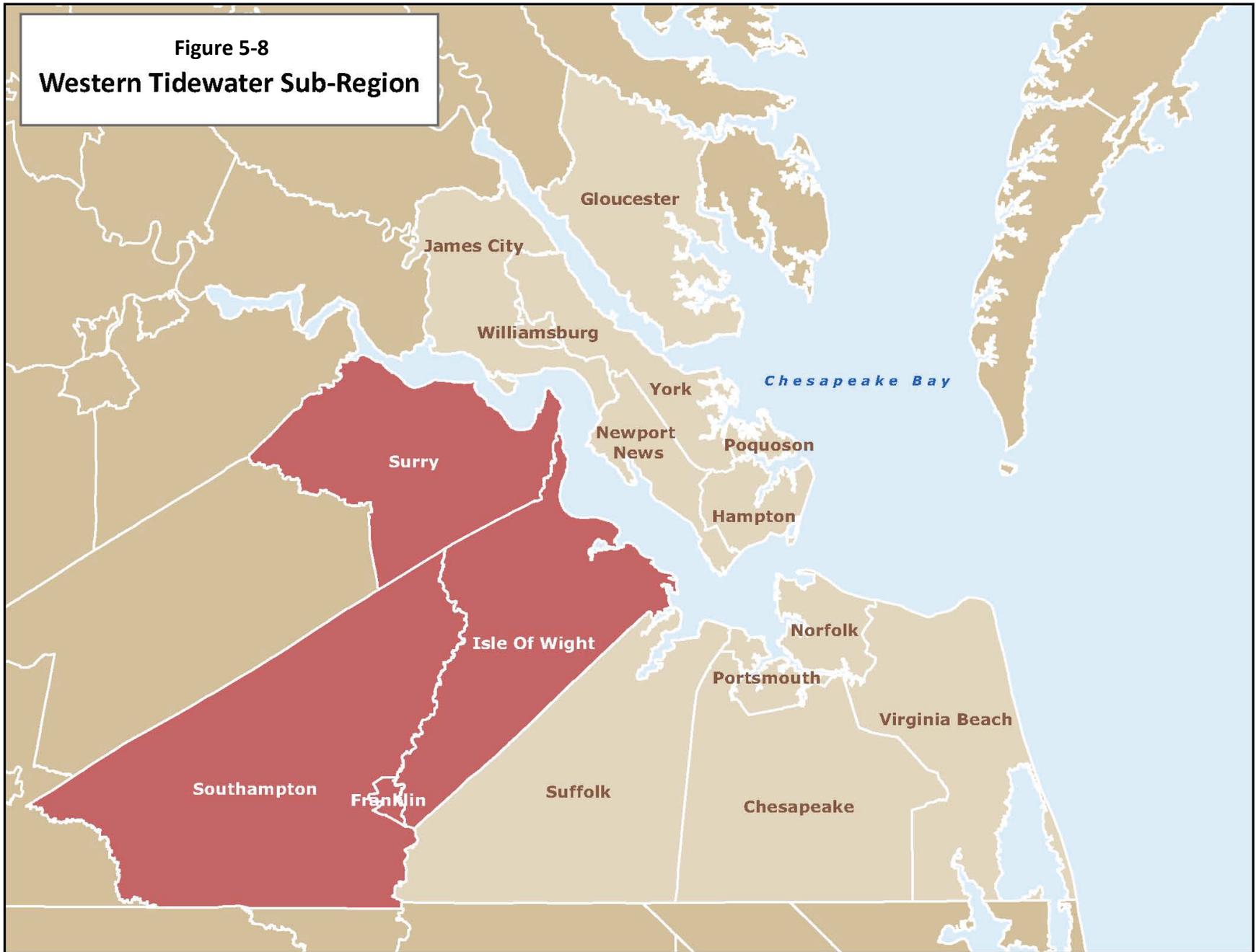
Capron, Courtland and Ivor have individual waterworks and local water supply emergency ordinances that match the criterion of Southampton County. Within this document, the town policies are not individually identified because they match the policies of Southampton County. Southampton County drought response includes the towns of Boykins, Branchville, Capron, Courtland, Ivor, and Newsoms.

The public water system in Isle of Wight is limited to three service districts. The Newport Development Service District is adjacent to the Town of Smithfield. The Windsor Development Service District surrounds the Town of Windsor. The Camptown Development Service District is adjacent to the City of Franklin. In addition to water purchased from Franklin, Isle of Wight purchases water from the Town of Smithfield and the City of Suffolk. As noted earlier, Isle of Wight will also receive water from Norfolk via WTWA supply beginning in 2014.

The towns of Smithfield and Windsor are located in Isle of Wight County. Both towns have local waterworks and their policies are identified separately from Isle of Wight County policies throughout the Drought Response Plan.

Surry County completed a Comprehensive Water and Sewer Plan in July 2008. Population projections for Surry County predict very low growth over the next 22 years. Even if all the predicted growth occurs within areas with central water and sewer utilities, the increase in capacity demand would be less than 4,000 GPD per year. The County of Surry does not use enough water to require a DEQ Ground Water Withdrawal Permit or drought response plan. There are three incorporated towns within Surry County: Claremont, Dendron, and Surry. Only the towns of Claremont and Surry use enough water to require DEQ permits and drought response plans.

**Figure 5-8**  
**Western Tidewater Sub-Region**



The entire county relies solely on groundwater wells and bases drought response on monitoring, the HR WET campaign and information shared through the regional decision making process. The Towns of Clarendon and Surry generally follow the drought response guidance of the state and local neighbors and are partners in regional efforts to reduce water use during emergencies.

Since all of the localities in the Western Tidewater sub-region rely on groundwater, they share information about drought indicators such as shallow, private wells losing head and impacts on the agricultural community.

**Local Policies**

All of the jurisdictions in the Hampton Roads region have adopted or have agreed to water conservation plans and/or water supply emergency ordinances (see Table 5-9). The localities of Hampton Roads have local drought management policies in addition to a regional drought response plan. The local drought response policies and ordinances are included in Attachment 1.

The localities have developed the Hampton Roads Drought Response Plan, which contains several sections: establishing drought authority, water emergency stages, indicators, public notice, actions, penalties, exemptions, termination of restrictions, and revision of the plan.

**Authority**

All drought response plans must clearly define an Authority to enact contingencies and restrictions during a water supply emergency and/or water shortage. The overall Hampton Roads drought authority is represented through the regional Directors of Utilities Committee. The Committee consists of Directors from local and regional water suppliers. The Committee meets monthly to talk about water supply and utility issues throughout the region.

Local governments have different methods of establishing authority to implement emergency water conservation measures. Many local jurisdictions must declare a water supply emergency prior to

establishing authority. Table 5-10 summarizes the methods of establishing Local Drought Authority from local ordinances and plans.

The Newport News City Council declares a water supply emergency and submits a report to each jurisdiction for which the NNWW supplies water. The Newport News City Council then agrees to empower the City Manager to act as the authority on emergency water conservation plans. Drought response actions for all NNWW customers (including those outside the City) are enforced through billing, which requires no civil action by other localities.

**Table 5-9: Local Drought Management Policy Formats**

Codified Water Supply Emergency Ordinance		
Franklin	Norfolk <sup>2</sup>	Town of Capron
Gloucester County	Southampton County <sup>3</sup>	Town of Courtland
Isle of Wight County	Suffolk	Town of Ivor
James City County	Virginia Beach	Town of Smithfield
Newport News <sup>1</sup>	York County	Town of Windsor
Special Ordinance enacted <i>only</i> during Water Supply Emergency Situations		
Chesapeake	Portsmouth	Williamsburg
Water Conservation Plan		
JCSA	NNWW <sup>1</sup>	Town of Clarendon
Williamsburg		Town of Surry <sup>4</sup>

1. NNWW supplies water to the cities of Newport News, Hampton, Poquoson and portions of Williamsburg and York County (York as of 2009).
2. Norfolk supplies water to Chesapeake, Virginia Beach, and Portsmouth.
3. Southampton County supplies water to the Towns of Boykins, Branchville and Newsoms. These towns have local plans to follow the lead of Southampton County.
4. Surry County and the Town of Dendron do not use enough water to require a DEQ Ground Water Withdrawal Permit or drought response plan.

DEQ has developed a drought response plan that describes the State’s authority to impose regional and statewide drought responses. Any local government may declare a local water emergency and implement drought response action prior to the declaration of emergency by the Governor of Virginia.

In the past, Utility Directors in the region have informed their counterparts when their locality enters a water emergency stage. During a Stage II Drought Warning, a weekly update of water resources is compiled by HRPDC. The Utility Directors continue to share their concerns with each other about drought to insure that all localities within the Region are prepared to deal with the developing emergency.

**Stages of Water Emergency**

The DEQ drought response plan provides for four stages of water supply emergency. The actions associated with each stage of water emergency are discussed in Section 5 below.

- Stage I: Drought Watch occurs when moderate but limited supplies of water are available.
- Stage II: Drought Warning occurs when very limited supplies of water are available.
- Stage III: Drought Emergency occurs when critically limited supplies of water are available.
- Stage IV: Extreme Drought Emergency occurs when only crucial supplies of water are available.

Every drought has a particular signature and the impacts of no two droughts will be identical. Due to the complex nature of droughts, responses to individual drought events must be tailored to the impacts that are being propagated.

**Indicators**

Indicators are pieces of easily accessible information that can be used to help determine the local water supply status and the severity of drought. Water supply indicators are based on climate, season and infrastructure; all of which may change on a daily basis. Indicators monitored by Hampton Roads may include: precipitation levels, gauged streamflows, groundwater levels, water supply reservoirs, and the US Drought Monitor Index.

The U.S. Drought Monitor Index was developed in 1999 to help assess national drought conditions. The Drought Monitor is a collaborative effort between Federal and academic partners, including the University of Nebraska-Lincoln National Drought Mitigation Center (NDMC), the U.S. Department of Agriculture (USDA)/Office of the Chief Economist (OCE)/World Agricultural Outlook Board (WAOB) Joint Agricultural Weather Facility, the National Oceanic and Atmospheric Administration (NOAA)/

**Table 5-10: Establishing Local Drought Authority in a Water Emergency**

City or Town Manager	County Administrator	Utility Director	Governing Body
Chesapeake	James City County <sup>1</sup>	Isle of Wight County	Franklin
NNWW <sup>1</sup>	Gloucester County		Windsor
Norfolk	York County <sup>1</sup>		Southampton County <sup>3</sup>
Portsmouth			Town of Claremont
Smithfield			Town of Surry
Suffolk			
Virginia Beach <sup>2</sup>			
Williamsburg			

1. NNWW represents Newport News, Hampton, Poquoson, James City County, and York County. York County and James City County may follow the actions of Newport News or their County Administrator.  
 2. Virginia Beach Authority is either the City Manager or Utility Director.  
 3. A Southampton County response applies to Southampton County and Towns of Boykins, Branchville, Capron, Courtland, Ivor, and Newsoms throughout the Drought Response Plan

National Weather Service (NWS)/National Centers for Environmental Prediction (NCEP)/Climate Prediction Center (CPC), and the NOAA National Environmental Satellite, Data, and Information Service National Climatic Data Center (NCDC).

The U.S. Drought Monitor is a synthesis of multiple indices, outlooks, and impacts such as the Palmer Drought Index, CPC Soil Moisture Model, United States Geological Survey (USGS) Weekly Streamflow, and Standardized Precipitation index. The Drought Monitor is produced on a weekly basis and depicted both on a map and in narrative form. The Drought Monitor is released each Thursday at 8:30 a.m. Eastern Time on the following website: <http://www.usda.gov/oce/weather/DroughtMonitor/index.htm>

The U.S. Drought Monitor is monitored as an indicator for regional response to water supply issues. The localities of Hampton Roads monitor this indicator for drought conditions and may also utilize additional modeling and methods as applicable for the region's varied water sources.

When the U.S. Drought Monitor indicates a D1: Moderate Drought for any water utility; water supply conditions will be an item for regional discussion at the following Directors of Utilities Committee meeting. The Hampton Roads Directors of Utilities Committee has been meeting monthly since 1993 and includes all of the Hampton Roads Planning District Commission localities. During the meeting, there will be a regional discussion of water supply and analysis of drought probability. Water Supply will remain a monthly agenda item until the U.S. Drought Monitor for the entire region returns to D0: Abnormally Dry.

The regional discussion of the Utility Directors, recommendations of local water supply staff and local data and trends will be considered by the Utility Directors to develop recommendations for the Local Drought Authority in each locality. The Local Drought Authority is discussed later in this section. The Local Drought Authority will determine when to implement drought ordinances and plans.

The Hampton Roads localities have not defined specific triggers for individual drought stages to allow for flexibility because of the varying characteristics of the multiple regional water sources and the nature of drought.

### **Public Notice**

Informing the public about water emergency and conservation efforts is critical to the success of the drought response plan. The public must be informed and actively involved in managing water use. Once the Authority determines there is a water supply emergency, a notification will be issued to the public indicating the reasons for the declaration.

Notification of water use restrictions may be printed in a newspaper of general circulation and broadcast over one or more radio or television stations serving the service area. Localities may jointly issue public notices of water emergencies through HRPDC or increase public education campaigns to reduce water demand. Additional means available to contact the public are print media, billing inserts, internet, flyers, direct mail, e-mail, door hangers, local government, speaker's bureau and direct customer contact.

HR WET is a public outreach program designed to develop and implement a regional approach to promoting efficient water use throughout Hampton Roads. The HR WET program message is targeted toward all water users within the entire Hampton Roads planning area, whether supplied by public water systems or self-supplied users. Public awareness of water conservation is a year-round program throughout Hampton Roads and HR WET is used to disseminate a uniform message region wide. HR WET increases advertising during water emergencies as budget permits. HR WET goals are to:

- Raise public awareness of the region's water supplies.
- Reduce per capita water consumption by increasing the number of people using water more wisely.

HR WET has been helping the Hampton Roads region move toward more efficient water use for 17 years. As the population has continued to increase, regional water demand has remained basically flat. For more information about HR WET, please visit [www.hrwet.org](http://www.hrwet.org).

**Water Emergency Actions**

The Hampton Roads Drought Response and Contingency Plan describes four drought stages and outlines response measures for each stage. Drought response procedures, discussed later in this section, include a variety of actions for the different stages of drought.

**Penalties**

Hampton Roads jurisdictions may utilize a combination of penalties such as fines, suspension of service, misdemeanors and jail time to enforce water emergency violations. Implementation of penalties places the enforcing entity into a policing mode of operations. Table 5-11 outlines penalties utilized by localities. The local ordinances and plans contain complete penalty descriptions.

A person charged with violating any provision of the water restrictions may be assessed a financial penalty varying from \$50 to \$2,500 by locality. The legal ramifications of these fines are similar to those of traffic tickets and must be able to stand up in court. Suffolk, the towns of Claremont and Surry and York County are the only jurisdictions which do not assess a fine for violations.

In the majority of jurisdictions, water service may be suspended to customers who continually violate the provisions of a water supply emergency. Following service suspension, all of these localities; except for Franklin, Norfolk and Virginia Beach, require payment of all outstanding charges and a reconnection fee before service is restored.

Penalties quickly add up in 11 jurisdictions because each act or each day’s continuation of a water violation is considered a separate offense. Five localities consider water violations a misdemeanor;

while Gloucester and Southampton Counties include provisions for jail time.

Norfolk’s and James City County’s policies state that violators will be charged appropriate fines and penalties for excess water usage.

The towns of Claremont and Surry do not have provisions in place for the use of penalties to enforce water violations.

**Table 5-11: Penalties Used to Enforce Water Violations**

Fines	Suspend Service	Separate Offenses	Misdemeanor
Chesapeake	Chesapeake	Chesapeake	Franklin
Franklin	Franklin	Gloucester County	Gloucester County
Gloucester County	Isle of Wight County	Isle of Wight County	Southampton County
Isle of Wight County	NNWW <sup>1</sup>	NNWW <sup>1</sup>	Virginia Beach
NNWW <sup>1</sup>	Norfolk	Portsmouth	Windsor
Norfolk	Portsmouth	Smithfield	
Portsmouth	Smithfield	Southampton County	
Smithfield	Suffolk	Windsor	
Southampton County	Virginia Beach	James City County	
Virginia Beach	James City County	Williamsburg	
Windsor	Williamsburg		
James City County			
Williamsburg			

1. NNWW represents Newport News, Hampton, Poquoson, and York County. Penalties are imposed on water bills and service can be suspended after four violations.

**Appeal for Exemptions**

Appeals procedures, summarized by locality in Table 5-12, is included in the Drought Response and Contingency Plan to allow for an exception from restrictions on water usage or excess charges.

Within the Hampton Roads planning area, most jurisdictions have an appeal process in place. The majority of local jurisdictions establish an Appeals Review Board upon declaration of a Water Supply Emergency. James City County and Virginia Beach enact an Appeals Review Board after a Stage II Water Emergency has been declared; and the City of Norfolk only during a Stage III Water Emergency.

The Hampton Roads localities of Isle of Wight County, Portsmouth, Smithfield, Southampton County, Suffolk, and the towns of Claremont, Smithfield, Surry and Windsor do not have provisions in place for an Appeals Procedure.

The Appeals Review Board will hear appeals for exemption on water allocations and surcharges. The Boards have the power by vote to approve, modify, or revoke earlier determinations.

**Table 5-12: Appeals Procedure during a Water Emergency**

Appeals Review Board	City Council
Chesapeake	Franklin
Gloucester County	
NNWW <sup>1</sup>	
Norfolk	
Virginia Beach	
James City County	
1. NNWW represents Newport News, Hampton, Poquoson, and York County Note: Williamsburg also allows for a written challenge to fines within 14 days of receipt of the bill	

**Termination of Restrictions**

The majority of local jurisdictions operate under emergency water conditions until the Authority notifies the governing body that the shortage is over and the water emergency no longer exists. Prior to the termination of a drought emergency, the Directors of Utilities Committee will discuss the regional water supply situation. Once a group decision has been made, the water supply emergency restrictions may be terminated in the localities. The local methods for terminating a regional drought emergency are summarized in Table 5-13.

**Table 5-13: Terminating Drought Emergency**

Authority Notify	Governing Body	Ordinance	Specific Trigger
Franklin	Portsmouth	Chesapeake	Gloucester County
Isle of Wight County	Suffolk	Portsmouth	James City County
NNWW <sup>1</sup>	Town of Claremont	Virginia Beach	
Smithfield	Town of Surry	Williamsburg	
Southampton County	Windsor		
1. NNWW represents Newport News, Hampton, Poquoson, and York County.			

Three cities depend on ordinance adoption to terminate a water emergency. In Chesapeake and Virginia Beach, the City Manager issues an order to rescind the emergency ordinance that restricted water use. Williamsburg enacts a new ordinance to repeal the previous water emergency.

Gloucester and James City County have specific triggers to terminate a drought emergency.

Norfolk’s City Manager can issue a declaration to terminate a water shortage or water emergency.

Once a water supply emergency has been terminated, the message may be posted for the public in a similar fashion to declaring a water emergency. The public is encouraged to continue following prudent restraint and conserve water voluntarily following the water emergency.

**Plan Revision**

The Hampton Roads Drought Response and Contingency Plan is part of the Regional Water Supply Plan that must be regularly reviewed and evaluated for effectiveness. Following state regulation 9 VAC 25-780, the drought response plan will be reviewed at least once every 5 years and revised at least once every 10 years to facilitate better drought response in the future.

**Drought Response Actions**

The Hampton Roads Drought Response and Contingency Plan drought stages and response measures are described below. Specific actions to include measures, monitoring and enforcement procedures, along with water use reduction goals are also described. The activities delineated below should be viewed as general activities and not required events that are “written in stone.”

**Stage I: Drought Watch**

A Drought Watch is designed to increase public and private sector awareness to climatic conditions likely to precede a significant drought event. During a Drought Watch, prudent water use is encouraged and preparation begins for more serious drought response action if needed. Public outreach is used to inform all water users within the region of the potential for drought conditions to intensify and provides potential water conservation activities. Stage I of the Virginia State Drought regulation requires activities to increase public and private sector awareness to climatic conditions that are likely to precede the occurrence of a significant drought event. In Hampton Roads, Stage I provides increased public awareness and requests voluntary water conservation from water users.

**Measures:** Measures taken in the Commonwealth of Virginia during a Drought Watch rely on voluntary conservation and the cooperation of customers to meet target consumption goals. Setting the exact conservation measures is left to the individual localities.

Throughout the Hampton Roads planning area, the Authority in each locality may ask for voluntary water conservation and prudent restraint in water use. Franklin, Hampton, Newport News and Poquoson specifically outline three areas for voluntary conservation.

- Watering of shrubbery, trees, lawns, grass, plants, or other vegetation.
- Washing of automobiles, trucks, trailers, or any other type of mobile equipment.
- Washing of streets, driveways, parking lots, service station aprons, office building, exteriors of homes or apartment or other outdoor surfaces.

**Monitoring and Enforcement Procedures:** Stage I actions rely primarily on voluntary conservation and cooperation of customers to meet target consumption goals and is monitored by the individual localities. If one locality moves into a Stage I Drought Watch, they will inform the entire Hampton Roads region through the Directors of Utilities Committee. Stage I will also result in an increase in the public notification and regional education programs. HR WET is used as a regional voice for Water Conservation measures in addition to the work of localities. There is no method to enforce voluntary water restrictions.

**Water Use Reduction Goal:** Target reduction goals vary by locality. Increased public awareness of target consumption goals and of voluntary water conservation activities may reduce water use up to 5 percent.

**Stage II: Drought Warning**

Drought Warning responses are required when the onset of a significant drought event is imminent. Stage II of the Virginia State Drought regulation requires voluntary water conservation. In the Hampton Roads region, Stage II requires more stringent mandatory water conservation and restricts or limits certain actions.

**Measures:** The specific mandatory measures to decrease water use are left to the individual localities. Localities may curtail or even prohibit the “Less Essential Usages of Water” during a Drought Warning. The following are generalized definitions for seven “Less Essential Water Uses” from the 2003 Virginia Drought Assessment and Response Plan.

1. Watering of shrubbery, trees, lawns, grass, plants, or other vegetation.
2. Washing of automobiles, trucks, trailers, or any other type of mobile equipment, excepting in facilities operating with a water recycling system approved by local government staff.
3. Washing of streets, driveways, parking lots, service station aprons, office buildings, home or apartment exteriors or other outdoor surfaces.
4. Operation of any ornamental fountain or other structure making similar use of water.
5. Filling or refilling of swimming or wading pools after the effective date of the order.
6. The use of water from fire hydrants for any purpose other than fire suppression or essential public purposes.
7. The serving of drinking water in restaurants, cafeterias or other food establishments unless requested by the individual.

**Monitoring and Enforcement Procedures:** Specific monitoring and enforcement procedures for Stage II Drought Warning mandatory water conservation actions are up to the individual localities. Table 5-14 summarizes the specific policies in local

ordinances and plans. The City of Suffolk and NNWW also incorporate water rate increases during Stage II actions. NNWW customers are charged at the normal rate for basic consumption per billing cycle; and the normal rate increases for greater consumption.

Suffolk has two levels of response during a Stage II Drought Warning. The first response is to implement a rate increase for customers who exceed their average water use and the second to curtail water use if the drought worsens.

**Table 5-14: Stage II Drought Warning Response**

Curtail 7 Uses of Water	Curtail Some Non-Essential Uses of Water
Chesapeake	Isle of Wight County - Except #7
Franklin	Smithfield – Except #7
Gloucester County	Suffolk <sup>3</sup> – Except #7
NNWW <sup>1</sup>	Town of Surry – Curtail #1,2,3 and 5
Norfolk	Windsor – Except #6
Portsmouth	
James City County	
Williamsburg <sup>2</sup>	
Southampton County	
Town of Claremont	
Virginia Beach	

1. NNWW represents Newport News, Hampton, Poquoson, Williamsburg, and York County. NNWW includes a 15 percent surcharge to current water rates after 600 cubic feet of water use per billing cycle.
2. Williamsburg adds Less Essential Use #8: Watering of golf course tees and greens is permitted daily between the hours of 8:00 pm and 8:00 am.
3. Suffolk implements both a rate increase and curtails water use.

**Water Use Reduction Goal:** Mandatory water use restrictions are the critical portion of Stage II Drought Warning actions and are monitored and enforced through the localities. The goal of Stage II Drought Warning action is water use reduction of 5 to 10 percent.

**Stage III: Drought Emergency**

Drought Emergency responses are required during the height of a significant drought event. During these times, it is likely that water supplies will not provide the amount of water needed by all users and non-essential uses of water should be eliminated. Stage III of the Virginia State Drought regulation requires the initiation of mandatory water conservation activities. In the Hampton Roads region, Stage III includes a combination of mandatory water use restrictions, rate increases and water allotments as defined by the locality.

**Measures:** Stage III Drought Emergency addresses a severe need for water demand reduction and includes a combination of mandatory restrictions, rate increases and water allotments as defined by the locality. Mandatory water use restrictions from Stage II would remain in place.

A temporary water rate increase may be used to reduce water use. During a water emergency, customers are allotted a percentage of water based on average consumption, specified volume or percent reduction of water use per billing period. Customers may be charged an increase for consumption above the allotted level.

**Monitoring and Enforcement Procedures:** The procedure for enforcing Stage III water allotments and rate increases is through retail billing (see Table 5-15). In Chesapeake, Portsmouth, Smithfield, Williamsburg, and Isle of Wight County the water rate increases over the standard amount and is applied to the entire amount of water used. Norfolk and James City County increase rates for water use in excess of the conservation goal.

The NNWW bases water allotments on the average use for a customer. Customers are charged at the normal rate for consumption

up to 600 cubic feet of water per billing cycle and the normal rate plus 30% for greater consumption.

Additional details covering specific rate increases are outlined in local ordinances and plans. Water allotments and rate increases are enacted through retail billing and are easier to enforce than mandatory water use restrictions. Significantly higher costs of water should encourage more prudent water use.

**Water Use Reduction Goal:** The goal of Stage III Water Emergency actions is water use reduction of 10 to 25 percent.

**Table 5-15: Stage III Drought Emergency Response**

Water Allotment and/or Rate Increases

Chesapeake	Southampton County
Franklin	Suffolk
Isle of Wight County	Town of Clarendon
James City County	Town of Surry
NNWW <sup>1</sup>	Virginia Beach
Norfolk	Williamsburg
Portsmouth	Windsor
Smithfield	

1. NNWW represents Newport News, Hampton, Poquoson, and York County.

**Stage IV: Extreme Drought Emergency**

A Stage IV: Extreme Drought Emergency is the final stage of a progressive situation, such as a drought of increasing severity or extreme facility failure. This stage addresses a critical need for water demand reduction. The Virginia State Drought regulation does not require a Stage IV drought emergency; however this additional stage has been adopted by most of the localities in the Hampton Roads region.

**Measures:** A Stage IV: Extreme Drought Emergency measures include all actions from Stage III along with further tightening of water restrictions and additional rate increases that apply to all water customers served by a local waterworks. Actions taken in a Stage IV Extreme Water Emergency are due to a critical need for water demand reduction and are extreme in order to quickly and significantly reduce water demand.

Specific measures for Stage IV water restrictions are left to the individual localities (see Table 5-16). Additional details are contained in local ordinances and plans. Chesapeake, Portsmouth, Smithfield and Isle of Wight County all give the local drought Authority power to further restrict water use to purposes that are absolutely essential to life, health and safety. Virginia Beach outlines Stage IV to specifically restrict or discontinue the supply of water to any industrial or commercial activity which uses water beyond the sanitary and drinking needs of its employees and invitees.

The localities of Franklin, Gloucester County, Southampton County, Town of Claremont, Town of Surry and Town of Windsor do not have provisions for a Stage IV Extreme Water Emergency.

**Monitoring and Enforcement Procedures:** Stage IV rate increases are enforced through retail billing as described in local ordinances and plans. NNWW employs an across the board water rate surcharge during a Stage IV Extreme Water Emergency. Additionally, both Newport News and James City County do not allow new water service connections during this stage.

**Water Use Reduction Goal:** The goal of Stage IV Extreme Drought Emergency actions is water use reduction of more than 15 percent.

**Summary**

The Hampton Roads Drought Response and Contingency Plan enhances local drought management policies with a regional framework for water emergencies. Long-term water demand management practices, discussed at the beginning of this section, along with the local drought ordinances and the regional drought plan provide complimentary tools for localities to apply in promoting the viability of future water supplies for the region.

**Table 5-16: Stage IV Extreme Drought Emergency Response**

Increased Water Restrictions and Rate Increases	Increased Water Restrictions
Chesapeake	Isle of Wight County
James City County	Portsmouth
NNWW <sup>1</sup>	Smithfield
Norfolk	
Suffolk	
Virginia Beach	
Williamsburg	

1. NNWW represents Newport News, Hampton, Poquoson, and York County.