

Water Efficiency Overview and City of Portsmouth's Efforts

Integrating Water Efficiency Into Daily Water System Operations

Seacoast Drinking Water Commission

August 27, 2020

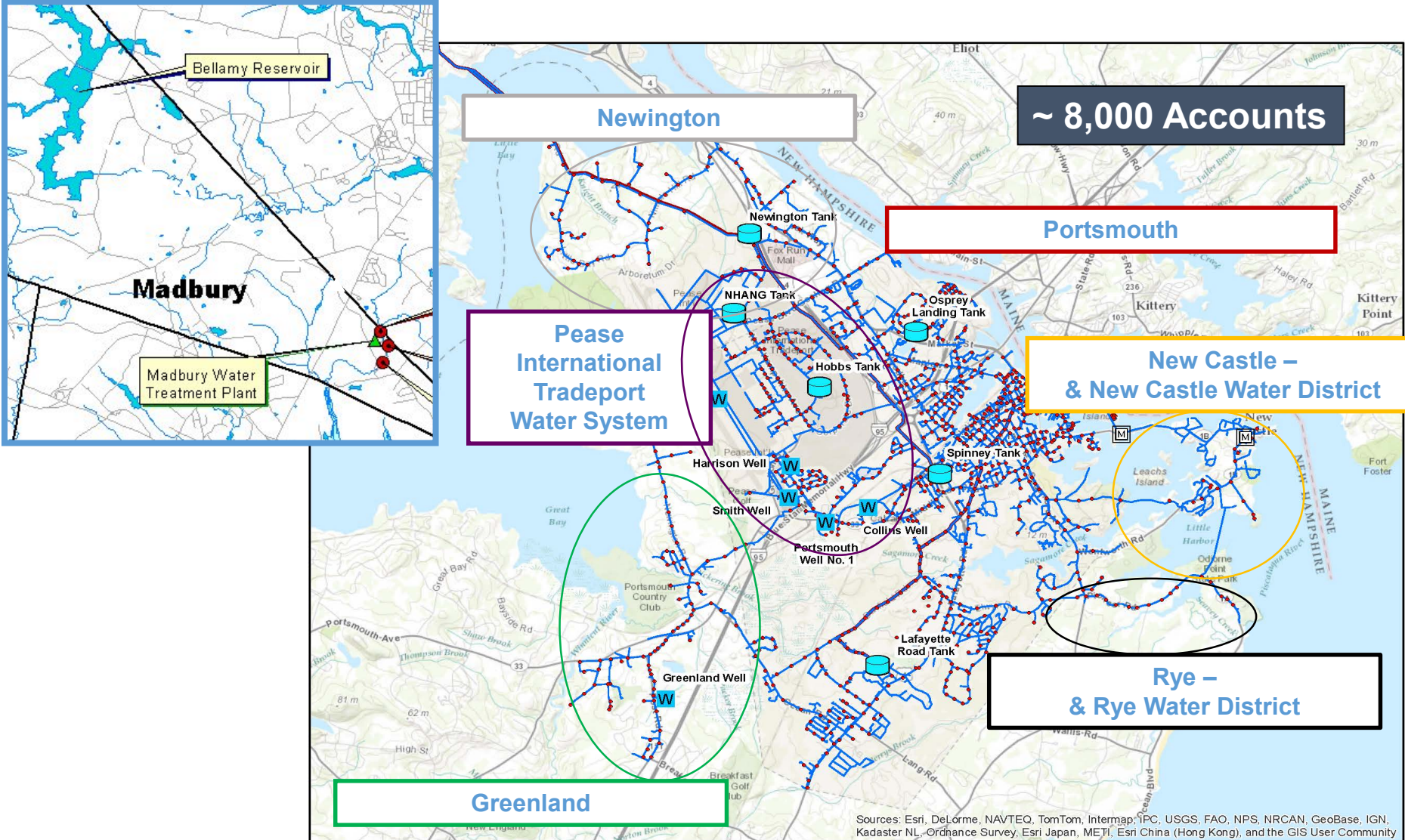
Brian Goetz

Deputy Director of Public Works

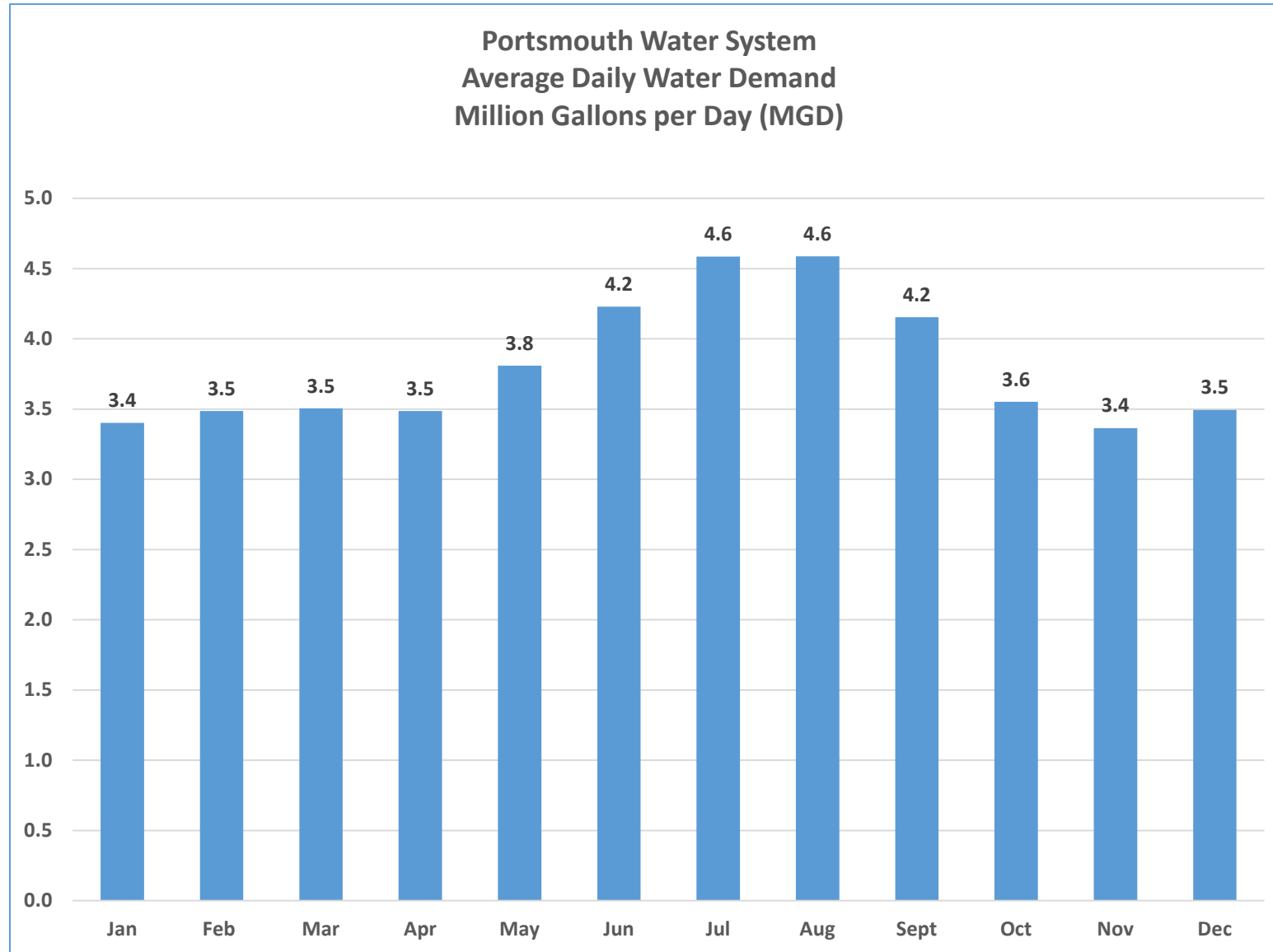
City of Portsmouth



Portsmouth Regional Water System and Pease International Tradeport Service Area

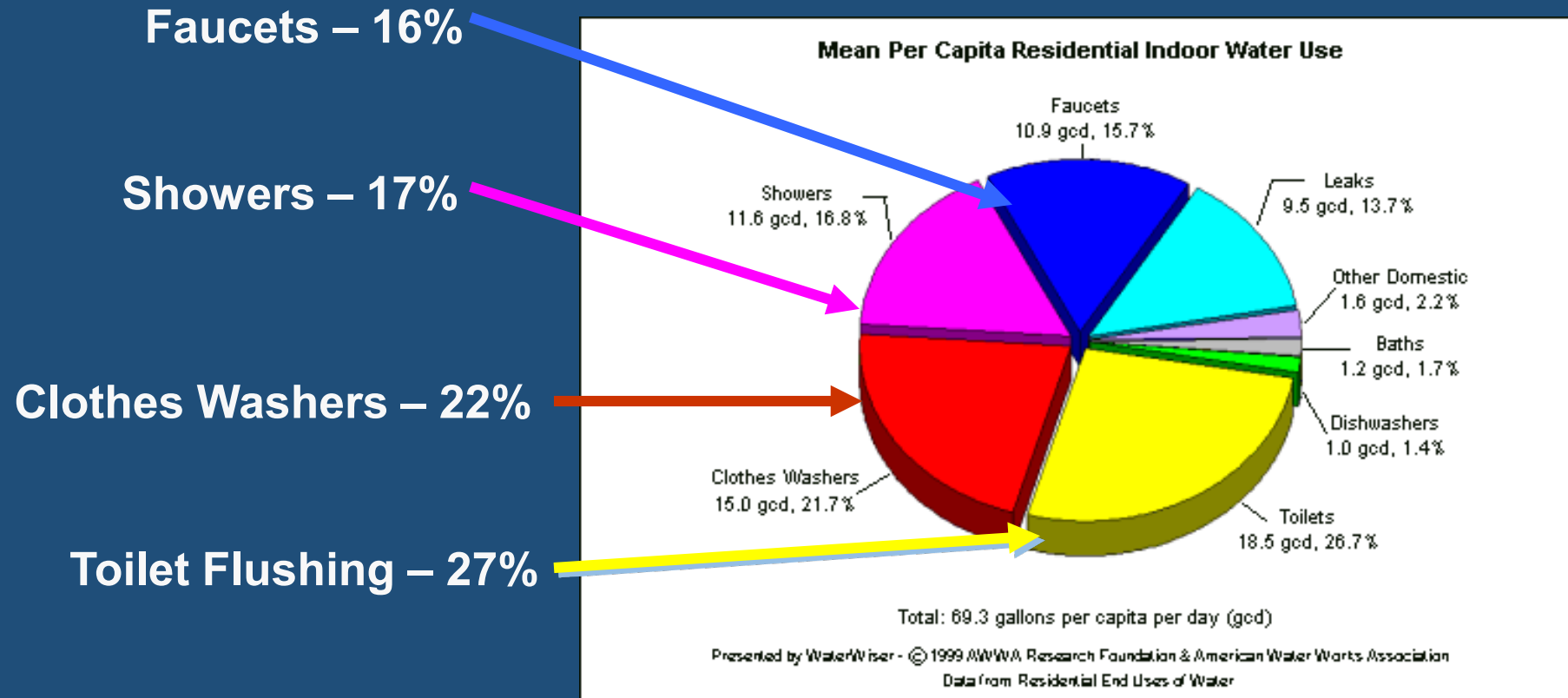


Portsmouth Average Water Demand

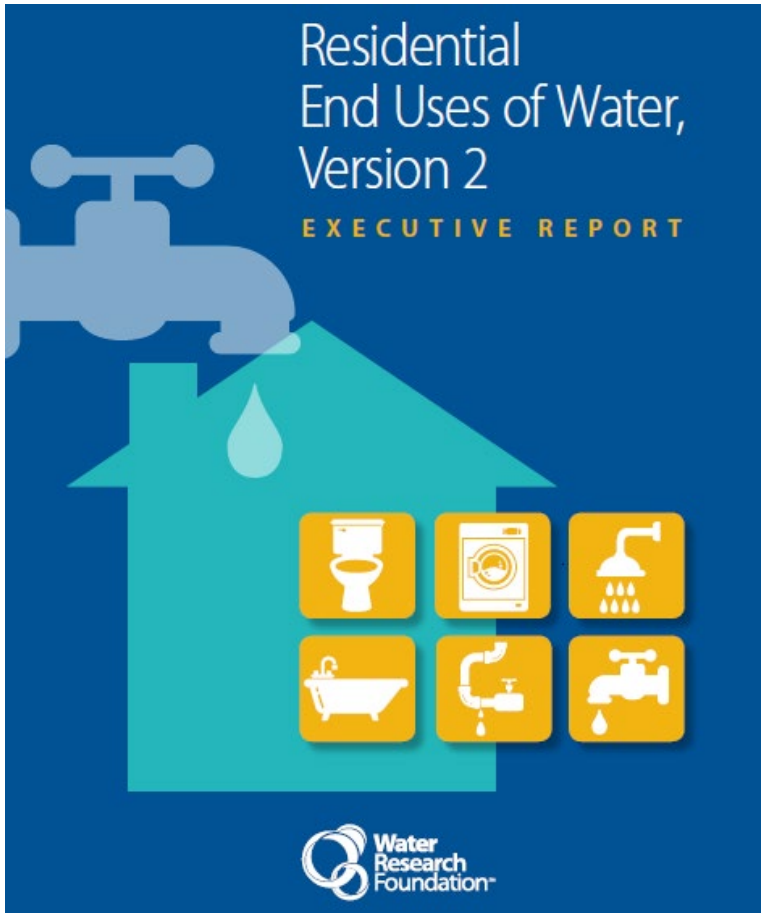


Typical Indoor Water Use

American Water Works Research Foundation



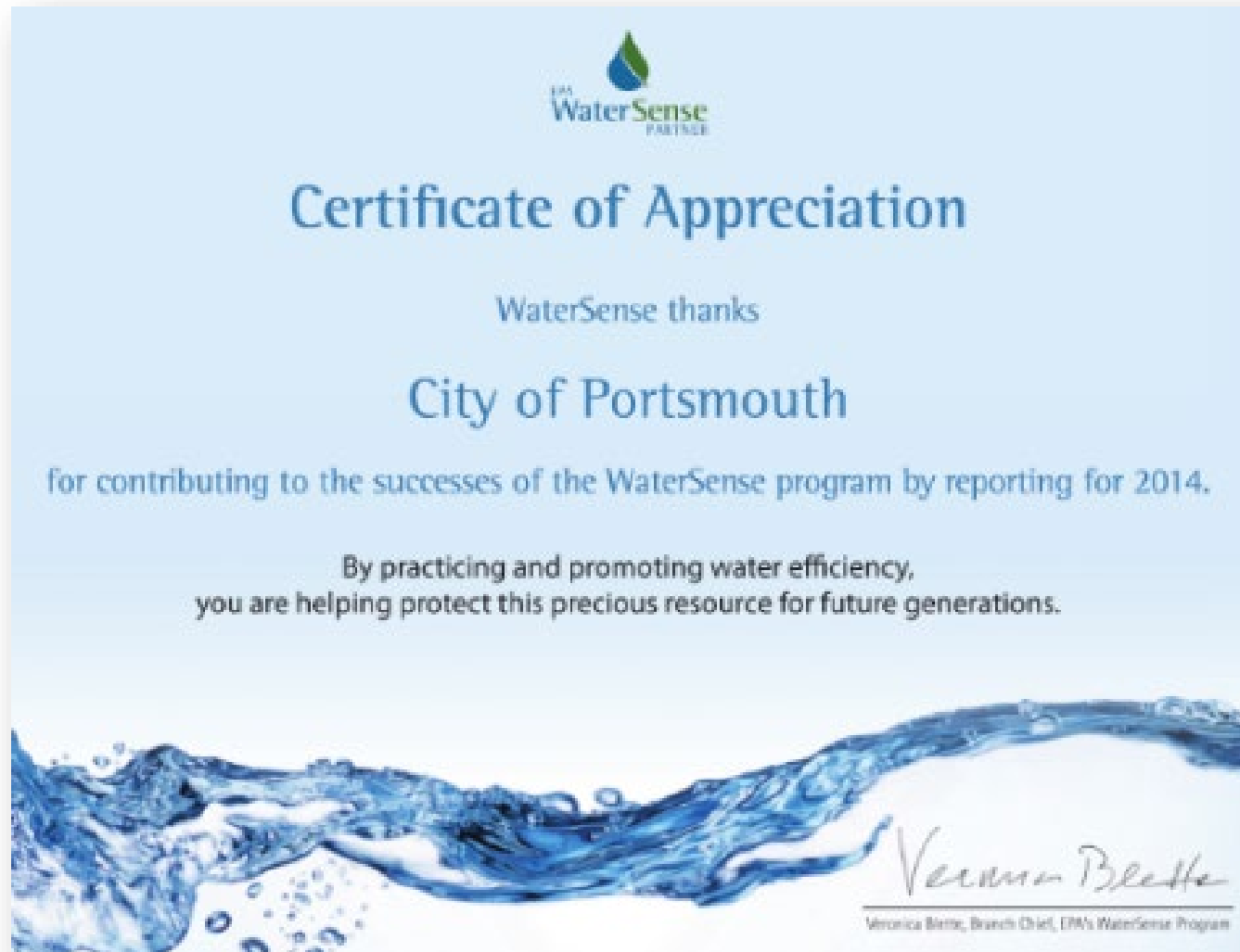
Portsmouth Water Use versus National Average



National Average Indoor
Water Use:
138 Gallons per Day

Portsmouth Average Indoor
Water Use:
119 Gallons per Day

Water Efficiency Efforts in Portsmouth



City of Portsmouth Water Conservation Retrofit Kits 2006 to 2008

Portsmouth Water Div.
680 Peaverly Hill Rd.
Portsmouth, NH 03801-0366

How many people in household? _____

May we have your phone number for a follow-up call? (The call will be from the Portsmouth Water Div. personnel relative to your experience with the water conservation kit. NO SALESMAN WILL CALL.) _____

Daytime phone number _____

Address label with account number _____

Niagara Conservation Corp.
PO Box 591
Cedar Knolls, NJ 07927

Portsmouth Water Div.
680 Peaverly Hill Rd.
Portsmouth, NH 03801-0366

Free Water Conservation Kit

Save money and help us to conserve water and energy. You can save money on your water and sewer bill AND energy costs on heating water by taking advantage of this program. The City of Portsmouth Water Division is providing one free water conservation kit to each residential water customer.

What's in it?
A water conservation kit will contain the following: two low flow bath faucets, low flow massage showerhead, low flow kitchen sink faucet aerator, two toilet tank water displacement bags, two packets of leak detector tablets, shower flow meter bag and complete instructions.

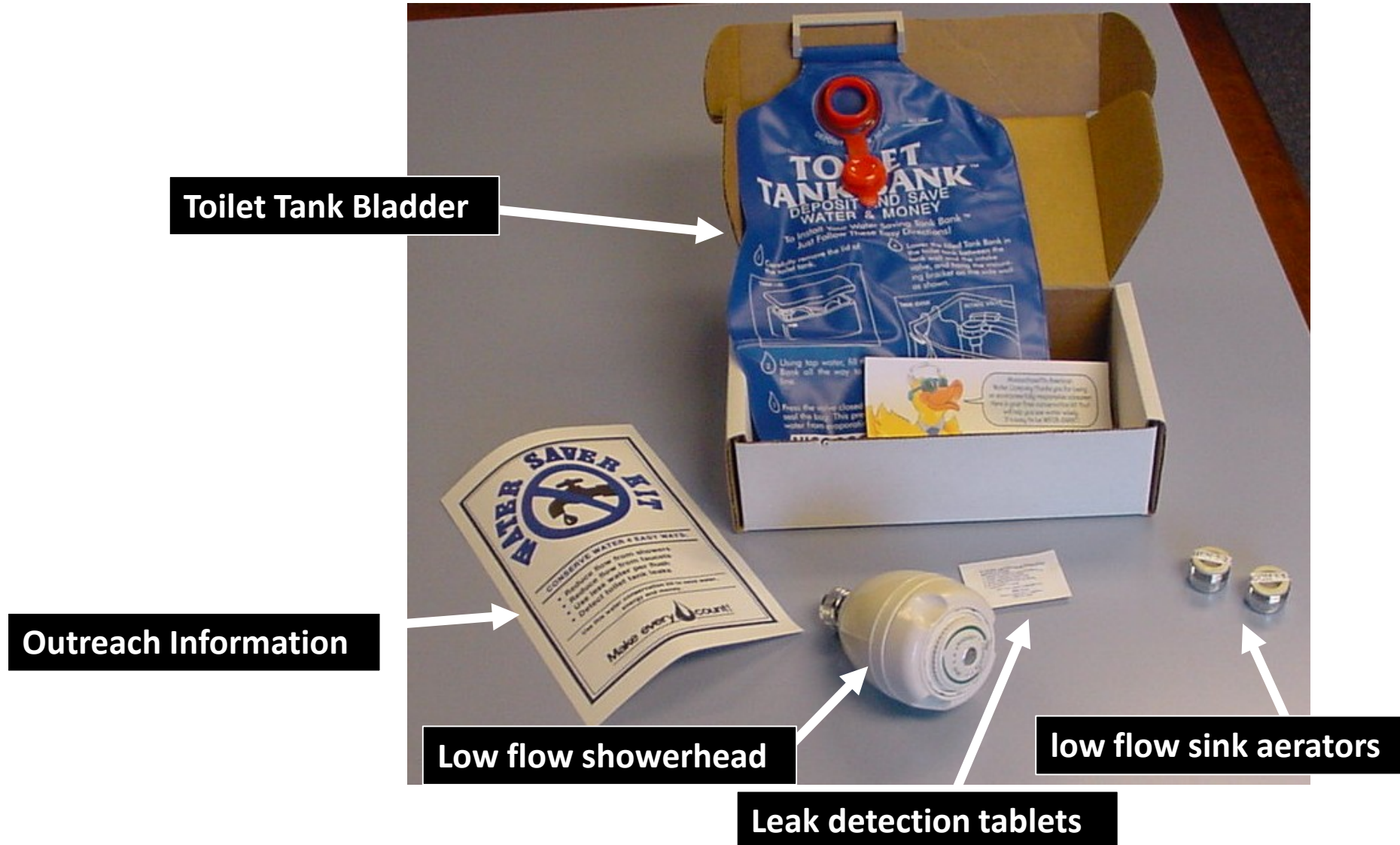
What is my cost?
The kit is free to all Portsmouth Water Customers. Just fill in the attached card and drop it in the mail.

Compliments of City of Portsmouth, Water Division, 786-1413

1,775
Water Conservation
Kits Distributed
Free to Portsmouth
Customers



Low-flow Retrofit Kits



Tiered Water Rates

Inclining Block Tiered Rates implemented in 2007

WATER RATES -

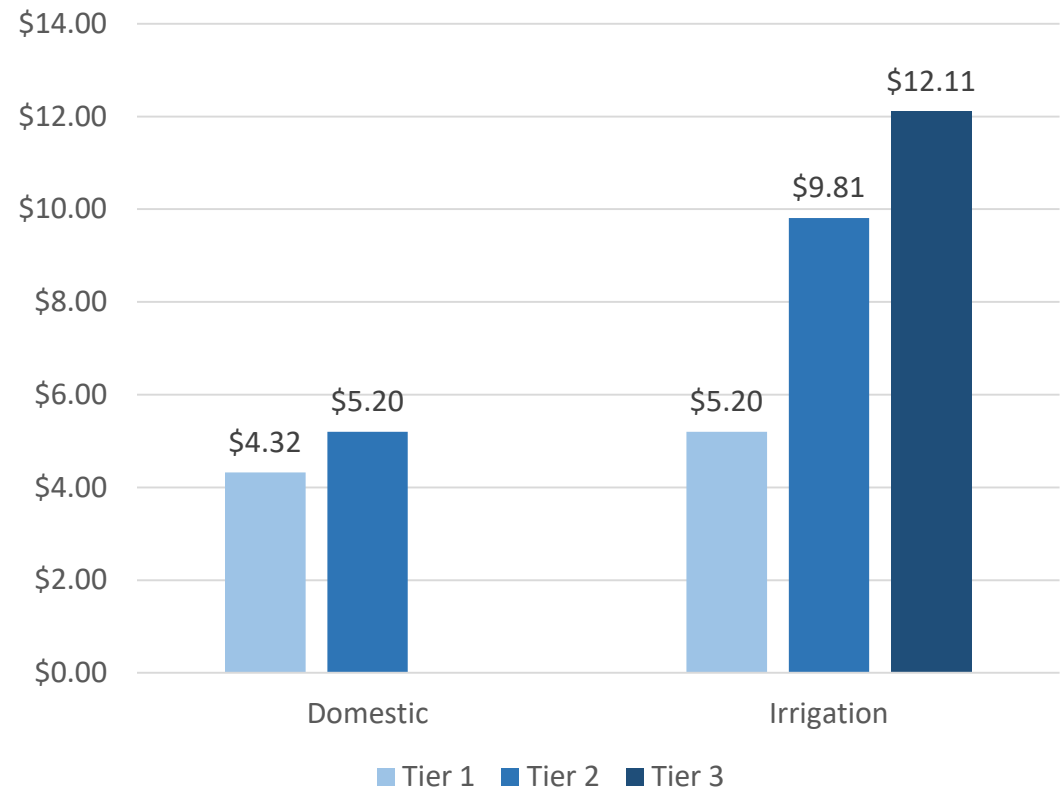
- Tier 1:** First 10 units of consumption billed at a rate of \$4.32 per unit.
- Tier 2:** Consumption above 10 units billed at a rate of \$5.20 per unit.

Irrigation Rates implemented in 2017

IRRIGATION METERS -

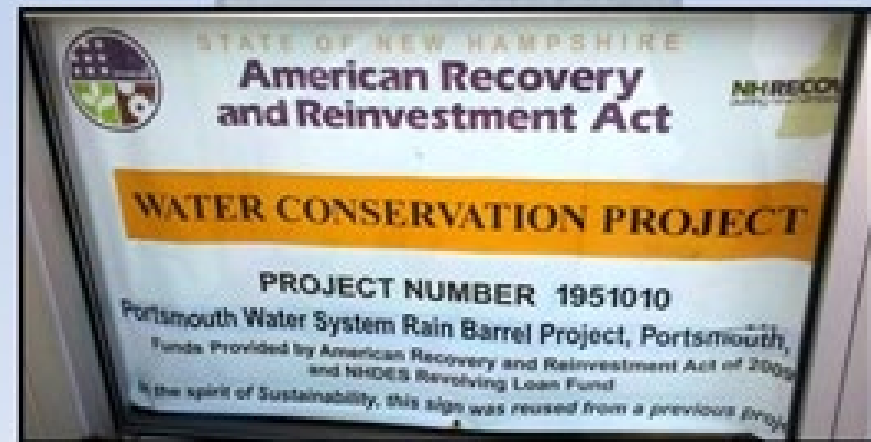
- Tier 1:** First 10 units of consumption billed at the rate of \$5.20 per unit.
- Tier 2:** Consumption above 10 units and up to 20 units billed at the rate of \$9.81 per unit.
- Tier 3:** Consumption above 20 units billed at the rate of \$12.11 per unit.

Portsmouth Water Rates – FY21



Rain Barrel Program 2009 to 2011

- Offered Rain Barrels to City of Portsmouth Residents
- Promoting water efficiency and stormwater management



Radio Read Water Metering System

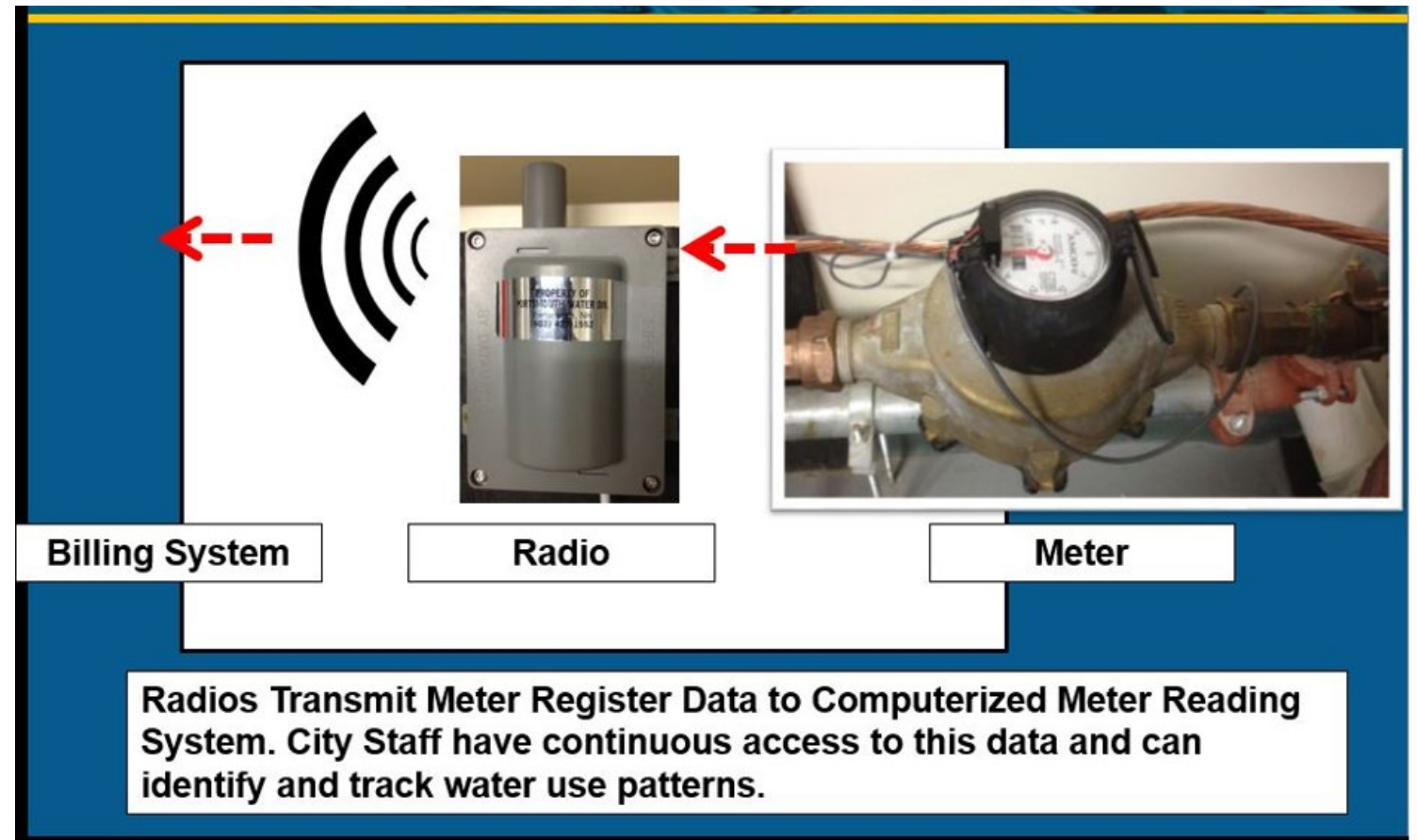


1914 – Water Meter with Manual read dial



Current System:

Water Meter with Radio read system



Metering, Meter Reading and Billing System

Billing System



Radio



Meter

Radios Transmit Meter Register Data to Computerized Meter Reading System. City Staff have continuous access to this data and can identify and track water use patterns.

Benefits of AMR Program:

- System transition has enabled City to go to monthly billing (bills used to go out three times a year)
- Consumers can now see the immediate impact of high water use on their bill
- Leaks identified quickly as water consumption can be compared to prior month or yearly use.
- Leak codes can track these users, allowing our customer service representatives to contact users about high water use.

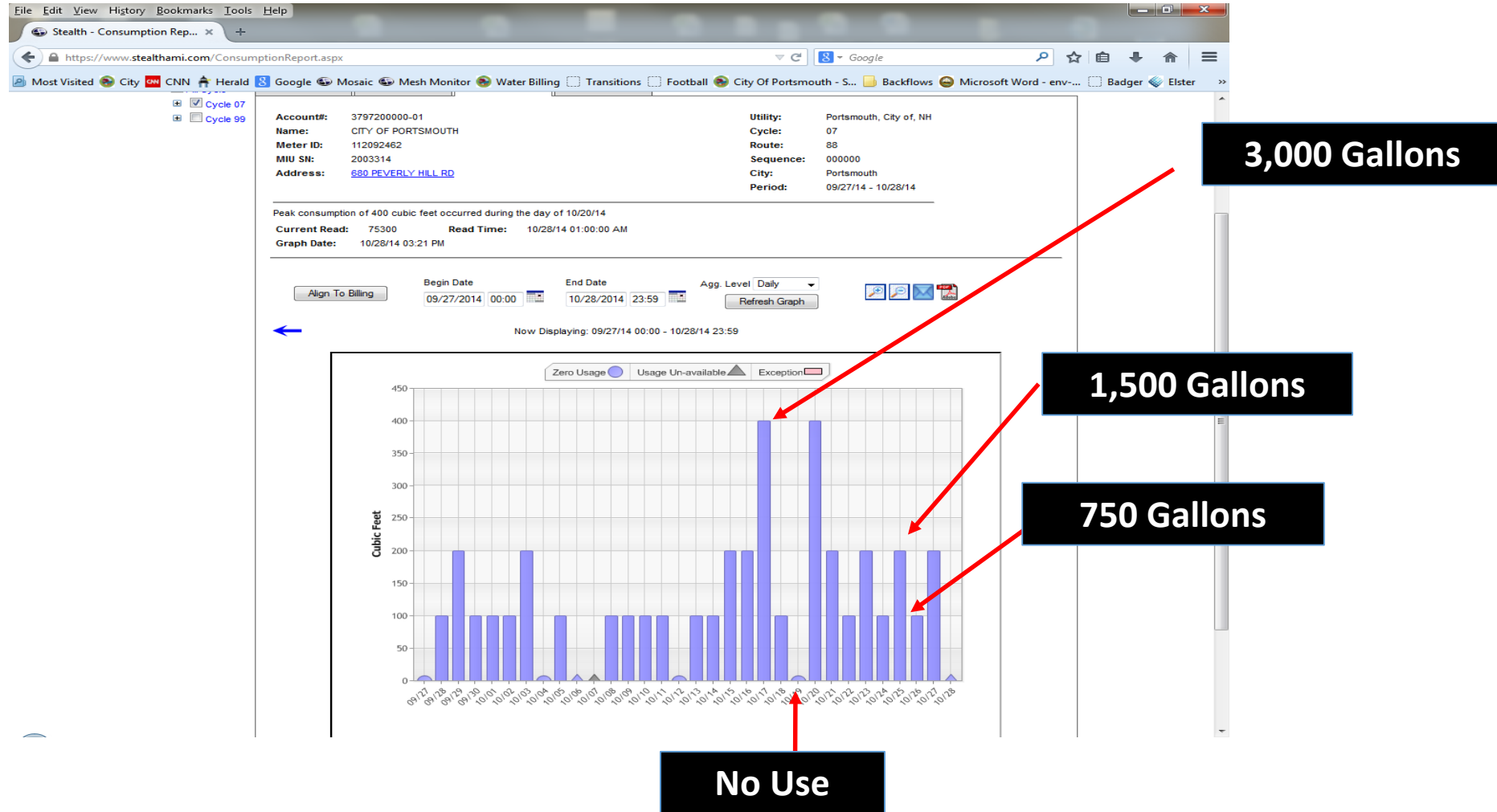
Customer Meter Replacements and Testing

2019 Metering

- 959 - meters changed out
 - 11% of all meters in system
- 1333 - new meter radios installed
- Converted to new billing system which provides monthly customer historical data – enabling ability to track and notice changes in usage



Tracking Daily Consumption, Example: - Public Works Facility



Metering/Billing Department Use of Daily Meter Reading Data:

Contacting customers when leak codes occur

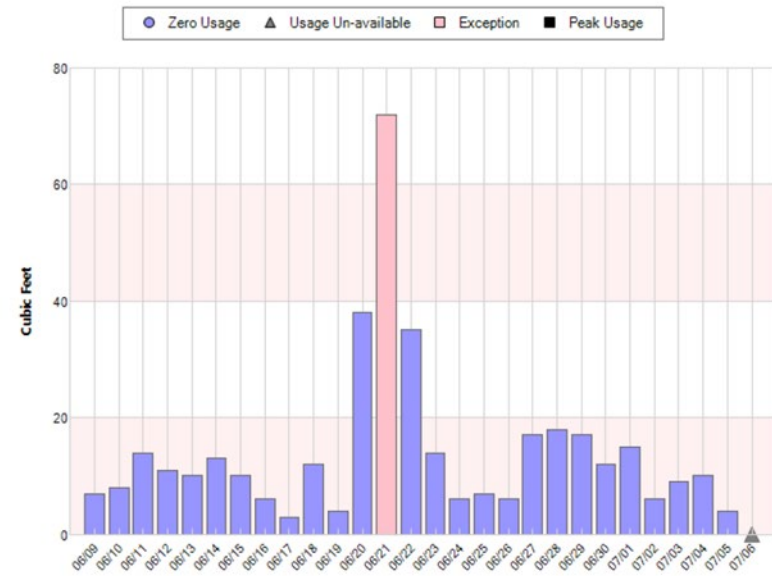
- 855 tagged events for Le60 (leak code)
- 223 direct communications with customers notifying of leak
- 561 Unique locations notified in FY20
- Mostly toilets, spiggots and broken irrigation lines (seasonal)

Address: [3205 LAFAYETTE RD #315 SALMON AVE](#) City: Portsmouth
Period: 6/9/2020 - 7/6/2020

Peak consumption of 72 cubic feet occurred during the day of 06/21/20

Current Read: 38356 Read Time: 7/6/2020 1:00:00 AM

Graph Date: 7/28/2020 9:13:59 AM



Customer Leak Code Example:

- Owner called about a high consumption water bill,
- We explained the Le60 from the report
- Owner was not convinced it was their issue and pointed at a faulty meter.
- Meter crew visited the site on 4/7 and explained to maintenance about a Le60 and found 1 toilet running, the crew also gave the customer
- As the graph indicates, the leaks were fixed

Address: [284 OCEAN RD](#)

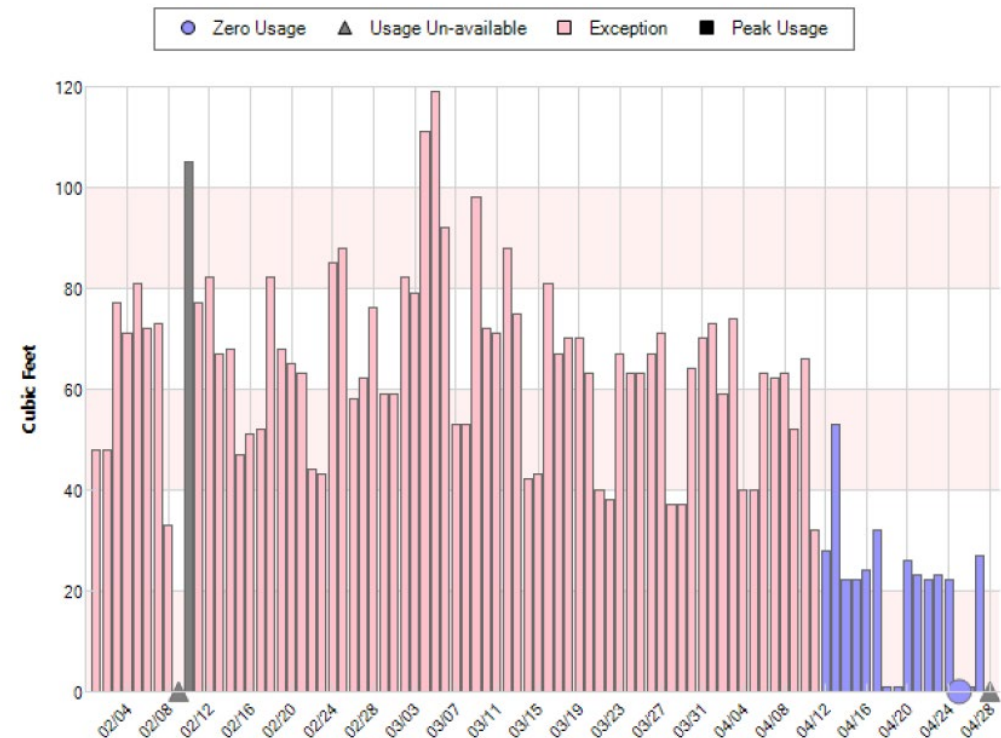
City: Portsmouth

Period: 2/1/2020 - 4/28/2020

Peak consumption of 119 cubic feet occurred during the day of 03/05/20

Current Read: 8541 Read Time: 4/27/2020 1:00:00 AM

Graph Date: 7/28/2020 9:28:25 AM



Customer Feedback:

August 21, 2019 Call to Water Billing Department:

- “I wanted to share a wonderful conversation I just had with the water customer at 296 Peverly Hill Rd. He wanted to express his appreciation for the City’s “Water Conservation Initiative”. He stated that a “wonderful person” stopped at his home and informed him he may have a leak. He discovered that a toilet he thought he had fixed was still leaking and he was able to correct it. He asked me to pass along his appreciation for the City implementing this program and the positive experience he had.”

February 24, 2020 Email to City’s webmaster:

- address: 188 Union St Portsmouth
- comments: I had a situation where my January water bill seemed way too high. I went into the Water Works Office un-announced. The receptionist called Jim who came down, greeted me and had me up to his office. He had me sit beside him as he went through a day by day, hour by hour, review of my account. He made me feel like I was the only person in Portsmouth who mattered. He spent a solid 45 minutes with me. He diagnosed what the problem was and sent me home with printed graphs showing it. Please pass this to Jim's superiors. He was awesome.

Joined EPA's WaterSense Program - 2014



WaterSense, a voluntary partnership program sponsored by the U.S. Environmental Protection Agency (EPA), is both a label for water-efficient products and a resource for helping you save water.

The WaterSense label makes it simple to find water-efficient products, new homes, and programs that meet EPA's criteria for efficiency and performance. WaterSense-labeled products and services are certified to use at least 20 percent less water, save energy, and perform as well as or better than regular models.

WaterSense partners with manufacturers, retailers and distributors, homebuilders, irrigation professionals, and utilities to bring WaterSense to your community. Our partnerships encourage innovation in manufacturing and support sustainable jobs for American workers.



The City of Portsmouth's staff will be presenting more information about our WaterSense Program at the Portsmouth Farmers' Market on Saturday, July 27, 2013. For more info, please visit our wastewater website: <http://www.portsmouthwastewater.com>



Water Efficiency Rebate Program

Introduced in 2015

The First Such Program in New Hampshire



\$100



\$150



Residential Toilet and Washing Machine Rebate Program Additional Information

Q. Why is Portsmouth offering toilet and washing machine rebates?

A. We are offering this program to our customers as an incentive to replace older, inefficient toilets and washing machines with high efficiency models. This is another step toward making our water and sewer systems as efficient as possible. When customers use less water then we have to produce and treat less water and wastewater, which saves water and money for everyone in the long run.

Water Efficiency Rebate Program as of June 2020

\$125,000 in rebates issued through FY20



Rebate Type	FY16	FY17	FY18	FY19	FY20	TOTAL
High-Efficiency Toilet	253	368	161	79	102	963
High-Efficiency Washing Machine	34	24	26	36	68	188
TOTAL REBATES	287	392	187	115	170	1,151



How Old Is Your Toilet? Water Use Per Flush

Pre-1980's:
5 Gallons



1980's:
3.5 Gallons



Now:
1.6 Gallons or less



Water Savings ...



Most full-sized **High Efficiency washers** use 13 gallons of water per load, compared to the 27 to 40 gallons used by standard top loading machines.

Water Savings Potential

- **Typical Family of Four, each flushing 4x/day:**
 - 3.5 gallon toilet = 56 gallons/day
 - 1.28 gallons toilet = 20.5 gallons/day
 - **Savings of 13,000 gallons/year**
- **One Load of Laundry a Day:**
 - Older Top Loading Washer = 40 gallons/day
 - High Efficiency Washer = 13 gallons/day
 - **Savings of 10,000 gallons/year**

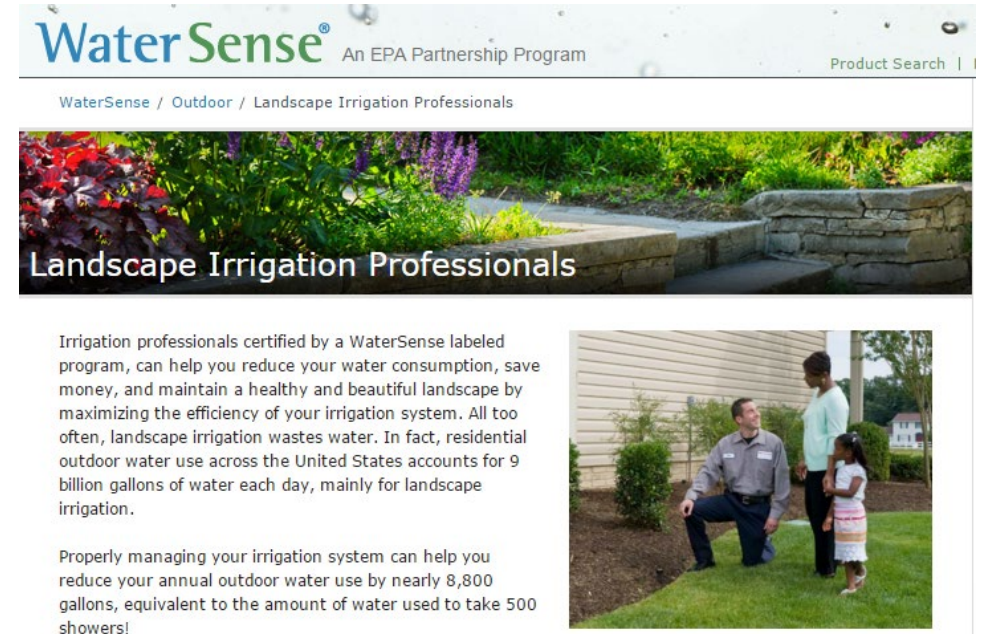
The Value of Water Efficiency

- It costs less money to save a gallon of water than to invest in a new source of supply, treatment and operations
- Operational cost of water efficiency is \$0

	Capital Investment			Operational Cost /Day
	Cost	Gallons /day	Cost /gallon /day	
Water Treatment Facility Upgrades	\$25,000,000	4,000,000	\$6.25	\$3,835
Toilet Rebate	\$100	35.5	\$2.82	\$0
Washing Machine Rebate	\$150	27	\$5.56	\$0

Implemented WaterSense Irrigation Requirements and Third Tier Irrigation Rate in 2017

- Chapter 11 of City Ordinances:
 - Only a landscape irrigation system designed and installed by an Environmental Protection Agency Watersense Certified Irrigator



The screenshot shows the WaterSense website page for Landscape Irrigation Professionals. The header includes the WaterSense logo and the text "An EPA Partnership Program". Below the header, there is a navigation menu with "WaterSense / Outdoor / Landscape Irrigation Professionals". The main content area features a large image of a garden with the text "Landscape Irrigation Professionals" overlaid. Below this, there is a paragraph of text explaining the benefits of certified irrigation professionals and a smaller image of a professional consulting with a family in a yard.

WaterSense® An EPA Partnership Program Product Search |

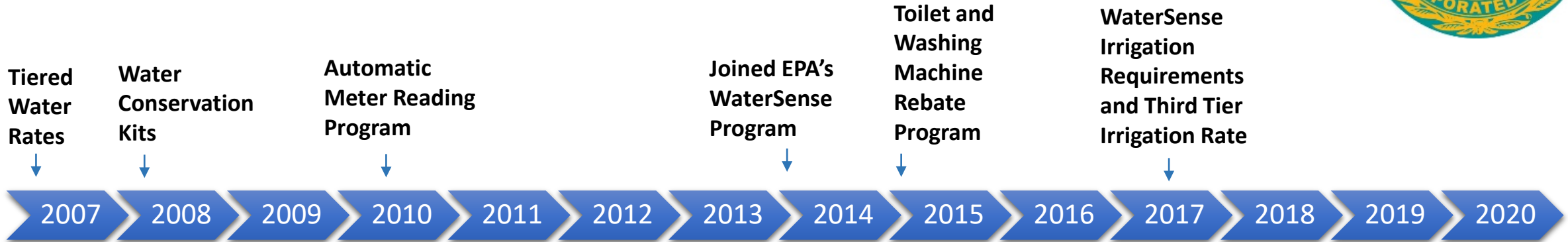
WaterSense / Outdoor / Landscape Irrigation Professionals

Landscape Irrigation Professionals

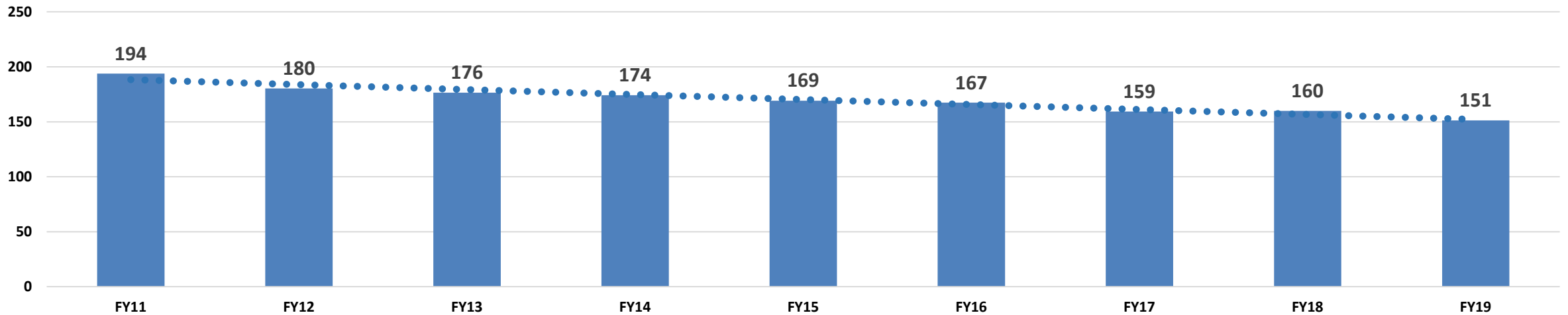
Irrigation professionals certified by a WaterSense labeled program, can help you reduce your water consumption, save money, and maintain a healthy and beautiful landscape by maximizing the efficiency of your irrigation system. All too often, landscape irrigation wastes water. In fact, residential outdoor water use across the United States accounts for 9 billion gallons of water each day, mainly for landscape irrigation.

Properly managing your irrigation system can help you reduce your annual outdoor water use by nearly 8,800 gallons, equivalent to the amount of water used to take 500 showers!

Water Efficiency Timeline

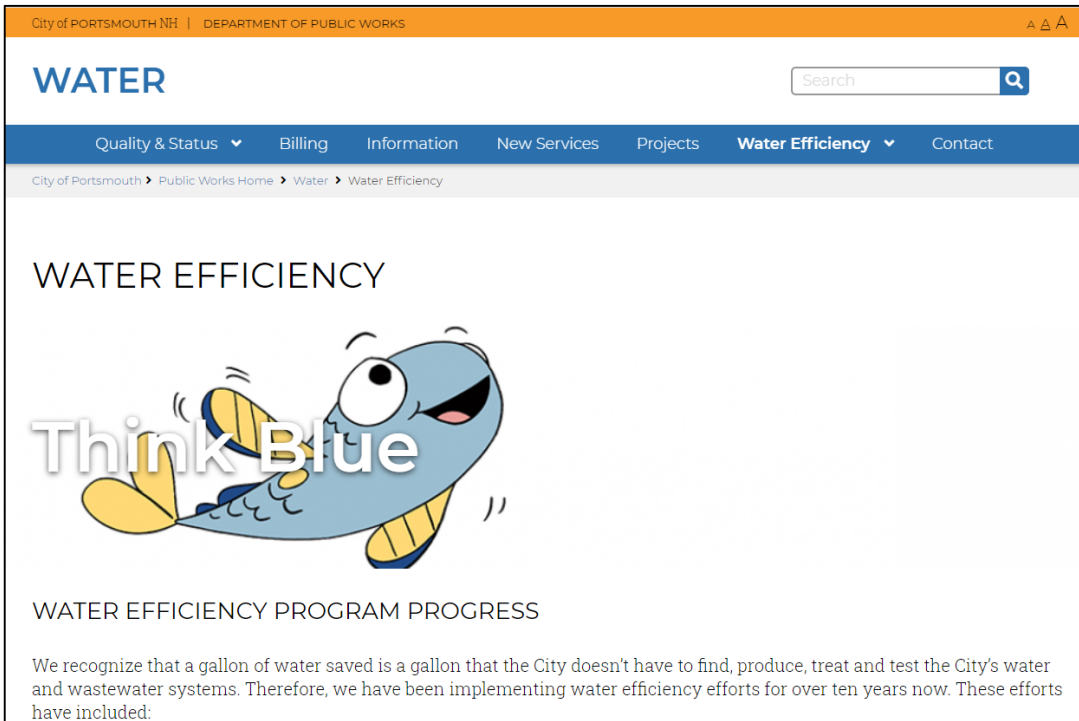


Trend - Average Residential Water Use Average (gallons per day)



Public Outreach:

City Website, Mailers and Brochures:




City of PORTSMOUTH NH | DEPARTMENT OF PUBLIC WORKS

WATER

Quality & Status | Billing | Information | New Services | Projects | **Water Efficiency** | Contact

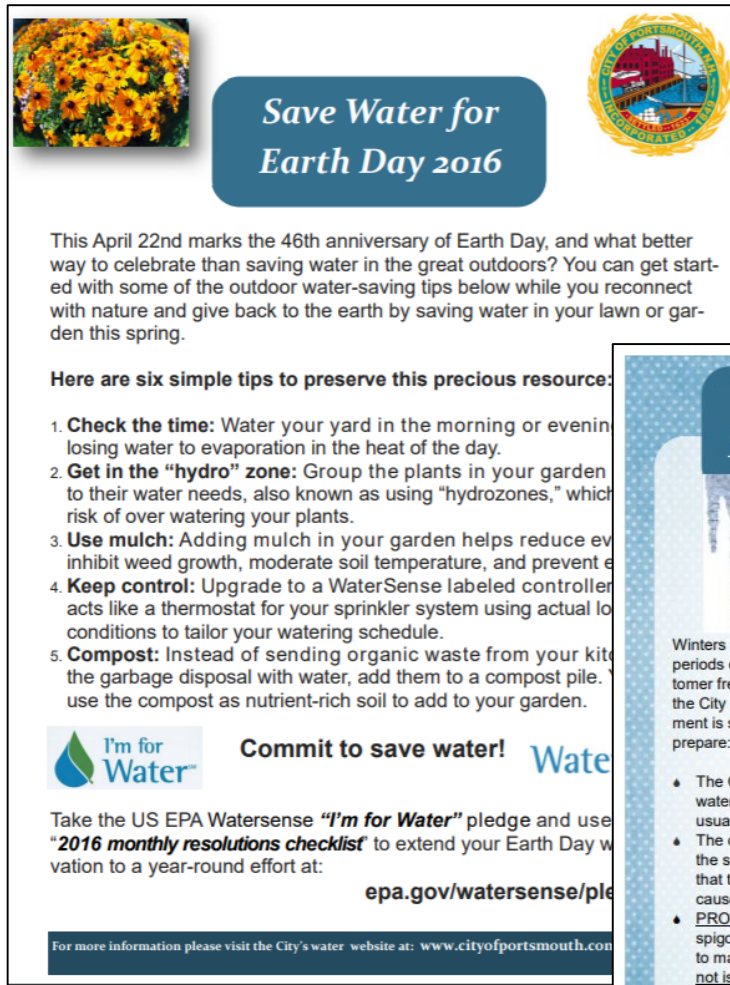
City of Portsmouth > Public Works Home > Water > Water Efficiency

WATER EFFICIENCY



WATER EFFICIENCY PROGRAM PROGRESS

We recognize that a gallon of water saved is a gallon that the City doesn't have to find, produce, treat and test the City's water and wastewater systems. Therefore, we have been implementing water efficiency efforts for over ten years now. These efforts have included:




Save Water for Earth Day 2016

This April 22nd marks the 46th anniversary of Earth Day, and what better way to celebrate than saving water in the great outdoors? You can get started with some of the outdoor water-saving tips below while you reconnect with nature and give back to the earth by saving water in your lawn or garden this spring.

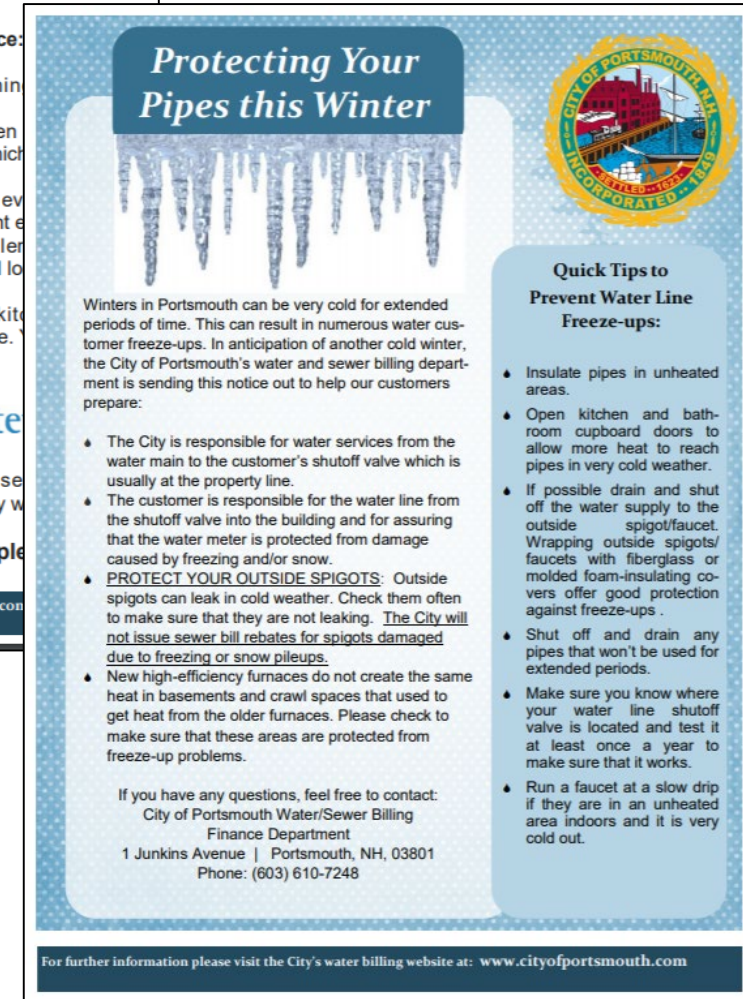
Here are six simple tips to preserve this precious resource:

- 1. Check the time:** Water your yard in the morning or evening to avoid losing water to evaporation in the heat of the day.
- 2. Get in the "hydro" zone:** Group the plants in your garden to their water needs, also known as using "hydrozones," which reduces the risk of over watering your plants.
- 3. Use mulch:** Adding mulch in your garden helps reduce evaporation, inhibit weed growth, moderate soil temperature, and prevent erosion.
- 4. Keep control:** Upgrade to a WaterSense labeled controller. It acts like a thermostat for your sprinkler system using actual local conditions to tailor your watering schedule.
- 5. Compost:** Instead of sending organic waste from your kitchen to the garbage disposal with water, add them to a compost pile. You can use the compost as nutrient-rich soil to add to your garden.

 **Commit to save water!** www.epa.gov/watersense/pledge

Take the US EPA Watersense "I'm for Water" pledge and use the "2016 monthly resolutions checklist" to extend your Earth Day water conservation to a year-round effort at:

For more information please visit the City's water website at: www.cityofportsmouth.com



Protecting Your Pipes this Winter

Quick Tips to Prevent Water Line Freeze-ups:

- Insulate pipes in unheated areas.
- Open kitchen and bathroom cupboard doors to allow more heat to reach pipes in very cold weather.
- If possible drain and shut off the water supply to the outside spigot/faucet. Wrapping outside spigots/faucets with fiberglass or molded foam-insulating covers offer good protection against freeze-ups.
- Shut off and drain any pipes that won't be used for extended periods.
- Make sure you know where your water line shutoff valve is located and test it at least once a year to make sure that it works.
- Run a faucet at a slow drip if they are in an unheated area indoors and it is very cold out.

Winters in Portsmouth can be very cold for extended periods of time. This can result in numerous water customer freeze-ups. In anticipation of another cold winter, the City of Portsmouth's water and sewer billing department is sending this notice out to help our customers prepare:

- The City is responsible for water services from the water main to the customer's shutoff valve which is usually at the property line.
- The customer is responsible for the water line from the shutoff valve into the building and for assuring that the water meter is protected from damage caused by freezing and/or snow.
- **PROTECT YOUR OUTSIDE SPIGOTS:** Outside spigots can leak in cold weather. Check them often to make sure that they are not leaking. The City will not issue sewer bill rebates for spigots damaged due to freezing or snow pileups.
- New high-efficiency furnaces do not create the same heat in basements and crawl spaces that used to get heat from the older furnaces. Please check to make sure that these areas are protected from freeze-up problems.

If you have any questions, feel free to contact:
City of Portsmouth Water/Sewer Billing
Finance Department
1 Junkins Avenue | Portsmouth, NH, 03801
Phone: (603) 610-7248

For further information please visit the City's water billing website at: www.cityofportsmouth.com

Public Outreach: Water Supply Updates

Website Updates

City of PORTSMOUTH NH | DEPARTMENT OF PUBLIC WORKS

WATER

Quality & Status | Billing | Information | New Services | Projects | Water Efficiency | Contact

Water Operations

WATER NEWS

WA PORTSMOUTH WATER SUPPLY STATUS REPORT FOR AUGUST 2020
August 6, 2020
MODERATE DROUGHT CONTINUES FOR SEACOAST AREA
Despite some recent rain events, the Sea...
[Read More >](#)

PW PORTSMOUTH WATER SUPPLY STATUS REPORT
July 1, 2020
MODERATE DROUGHT DECLARED Due to the dry weather and below normal precipitation in May and most of June, th...
[Read More >](#)

WA PORTSMOUTH WATER DIVISION RELEASES ANNUAL DRINKING WATER QUALITY REPORTS

WA PORTSMOUTH WATER DIVISION REQUESTS VOLUNTARY WATER RESTRICTIONS
August 24, 2020
The Drought Monitor issued on August 18, 2020 elevated New Hampshire's drought conditions in the Seacoast area...

Intensity:
None
D0 Abnormally Dry
D1 Moderate Drought
D2 Severe Drought
D3 Extreme Drought
D4 Exceptional Drought

The Drought Monitor focuses on small-scale conditions. Local conditions may vary. For more information on the Drought Monitor go to <https://droughtmonitor.unl.edu/About.aspx>

Author:
David Semel
Western Regional Climate Center

News

Seacoastonline.com

Portsmouth asks residents to limit water use

Posted Aug 25, 2020 at 5:26 PM

[f](#) [t](#) [e](#) [p](#)

PORTSMOUTH — The state Drought Management Task Force last week elevated drought conditions in the Seacoast from moderate to severe.

The Seacoast has received only 8 inches of precipitation since the beginning of May, compared to the 14-inch average for that time. The task force advises public water systems including Portsmouth's to implement outdoor restrictions as needed.

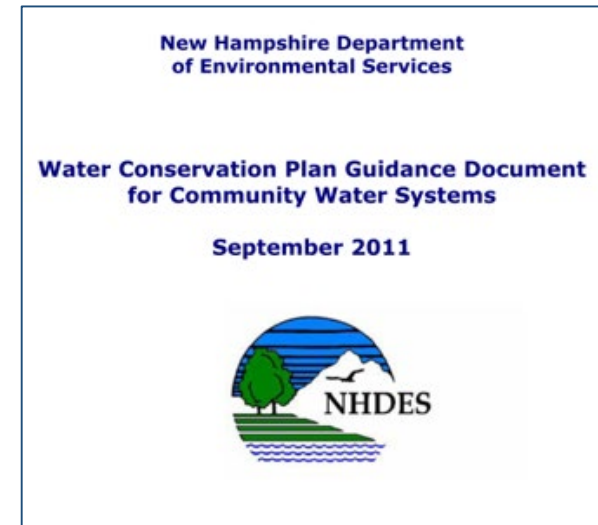
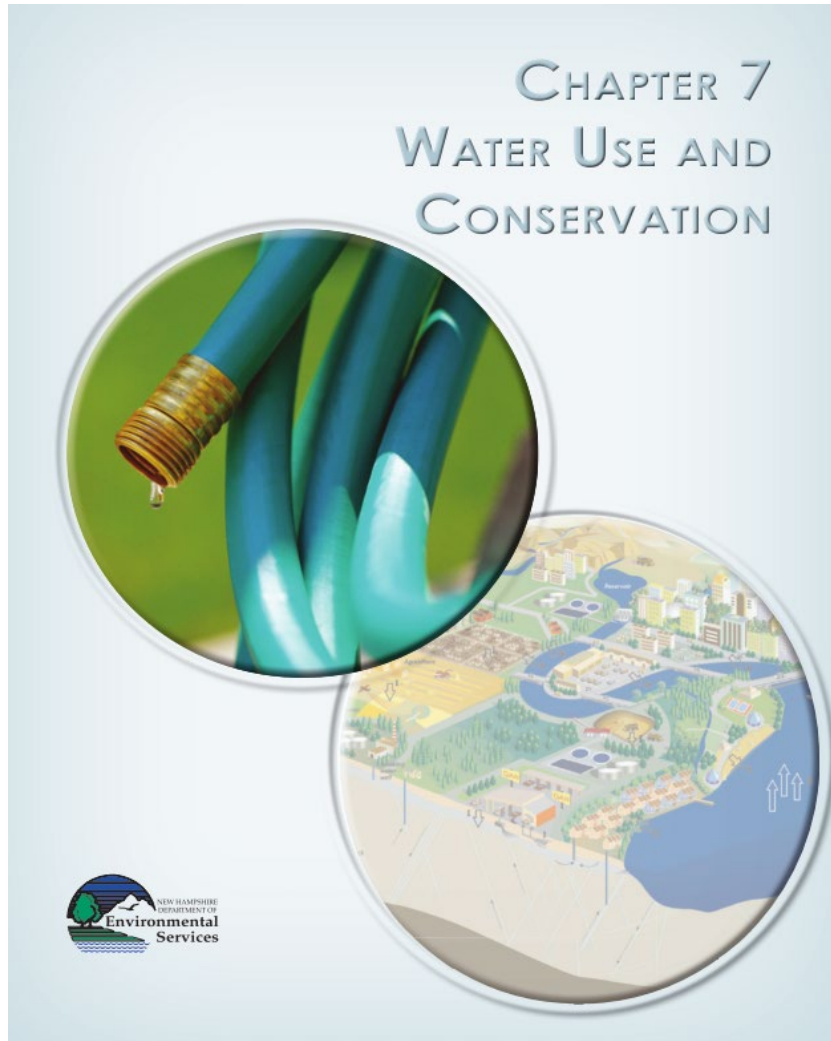
Based on the severe drought conditions and the state's recommendation, the city is encouraging voluntary restrictions. Customers are requested to restrict their use of water for outdoor irrigation, to be as efficient as possible and refrain from outdoor watering between 10 a.m. and 6 p.m.

"Although our groundwater levels remain fairly good, according to data tracked by the city's water operations staff, river levels are very low for this time of year and the reservoir is also lower than normal," said Deputy Director of Public Works Brian Goetz. "While we've had recent rain events, they have not produced much volume and it will take additional rainfall to recover from drought conditions."

Goetz said it is important that customers be efficient with their water use.

"If we can get good compliance with voluntary measures, and some precipitation," he said, "then we may not need to increase the restrictions."

New Hampshire DES Water Conservation



TITLE L WATER MANAGEMENT AND PROTECTION

CHAPTER 485 NEW HAMPSHIRE SAFE DRINKING WATER ACT

Rules for Water Conservation

Section 485:61

485:61 Rules for Water Conservation. –

I. The department shall adopt rules, pursuant to RSA 541-A, for water conservation practices for water users. These rules shall strike a reasonable balance between environmental, energy, and economic impacts and be consistent with current industry standards and practices for different types of water users.

II. The water conservation rules in paragraph I of this section shall apply to all new permit applicants and applications for water withdrawals subject to the provisions of RSA 485:3, RSA 485:48, RSA 485-C:21 and section 401 of the Clean Water Act.

III. Water conservation rules shall be consistent with applicable state or federal rules and regulations.

Source. 2002, 142:2, eff. July 12, 2002.



New Hampshire
Water Works Association

*Dedicated to improving municipal water supply
in the state of New Hampshire*

Water Conservation Position Statement

The New Hampshire Water Works Association is an advocate for public water suppliers in the State of New Hampshire. As such, the Association works with its professional members to assure adequate water supply, both in quality and in quantity. Recognizing that water is a valuable renewable resource in the communities we provide potable water to, the Association promotes the practice of water conservation to alleviate problems with inadequate water supply, reduce the stresses on aquatic ecosystems and sustain surface and ground water supplies. In particular, public water suppliers can benefit from water conservation measures as they seek to find ways to address increasing water demand without overtaxing existing supplies.

Water resource management and planning is a complex matrix of measures, including conservation, demand management, supply management (including flow augmentation) new source development and proper system maintenance, which a community may look towards when planning to meet the needs of today as well as tomorrow's water demands. While conservation is a necessary component of a community's water resource management plan, it is important that conservation is not substituted as a basis for meeting future demands.

The Association advocates proactive management of public water supplies by its members, to promote beneficial reduction in water losses, waste or use. The Association also recommends that its members develop effective long-range water supply planning that recognizes water conservation as an integral part of system management. Toward that goal, the Association recommends that water suppliers consider developing public education materials and a formal drought management plan as part of an ongoing effort to promote water conservation. These measures, as well as other utility initiatives, including active leak detection programs and meter maintenance, can be highly effective at meeting the goal of reducing unaccounted for water and thereby maximizing resources. Finally, water utilities and customers should recognize that rate structures may need to be adjusted to assure that water use efficiencies gained by conservation programs do not negatively impact the ability of maintaining a stable revenue base to sufficiently cover annual operating expenses.

Adopted by the New Hampshire Water Works Association
Board of Directors on October 24, 2006

Adopted by the New Hampshire Water Works Association Membership
at the Annual Meeting on November 9, 2006

Future Water Efficiency Efforts

- Continue to offer Water Efficiency Rebates
- Customer Outreach regarding water use and efficiency
- Promote more efficient irrigation practices through EPA's WaterSense Irrigation Certification

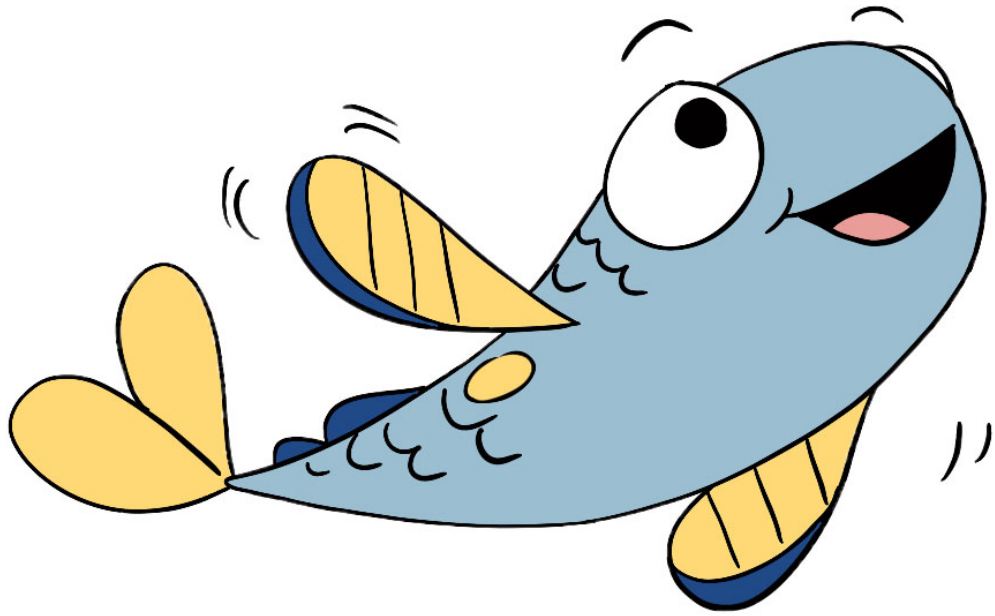
2015 New Hampshire Water Sustainability Award

- NHDES Commissioner Tom Burack presented the City of Portsmouth with NHDES' "Source Water Sustainability" award for a variety of water conservation measures being implemented, including New Hampshire's first customer rebate program that provides incentives for customers to install more water-efficient appliances.



Commissioner Tom Burack, Al Pratt – Portsmouth Water Resources Engineer, Peter Armstrong – Portsmouth Chemist

Thank You



Think Blue!



Water | Wastewater | Stormwater