

**Proposal to Redesign the City of  
Salem's Water & Sewer Bill to  
Promote Water Use Literacy and  
Sustainability - Update**

**John Hayes, Chair**

**Salem Sustainability, Energy and  
Resiliency Committee**

**Aug. 26, 2020 – Updated May 2021**

# Indoor Water Use at Home

When most people in the US want fresh, clean water, all they have to do is turn on a faucet. Still, no place is immune from drought, so it's important to be conservative with your water use at home, no matter where you live.

On average in the US, water use at home (water from the tap, toilet, dishwasher, etc.) adds up to about 138 gallons per household per day, or 60 gallons per person per day.

**Table 1. A daily breakdown of water use in the US:**

Appliance/Device	Household per Day	Percent of Total
Toilet	33 gallons	24%
Shower	27 gallons	20%
Faucet	27 gallons	20%
Washing Machine	22 gallons	16%
Leaks	18 gallons	13%
Bath	4 gallons	3%
Dishwasher	2 gallons	2%
Other	4 gallons	3%
Total	138 gallons	100% (101% with rounding)

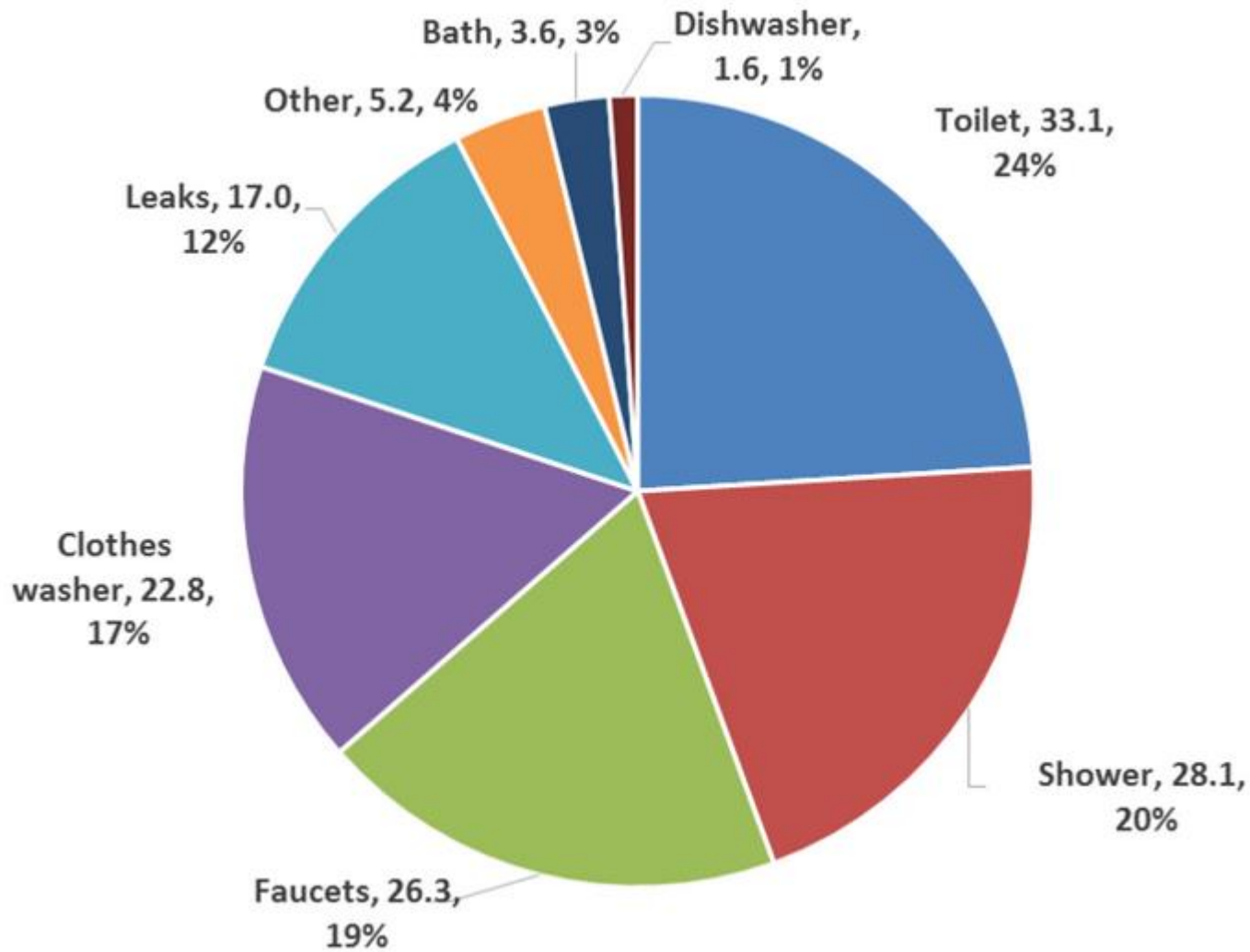
*SOURCE: Residential End Uses of Water, V2 (2016)*

# Residential water use in the U.S. and Canada

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From Wikipedia, the free encyclopedia

**Residential water use** (also called domestic use, household use, or [tap water](#) use) includes all indoor and outdoor uses of [drinking](#) quality water at [single-family](#) and [multifamily](#) dwellings.<sup>[2]</sup> These uses include a number of defined purposes (or water end uses) such as flushing toilets, washing clothes and dishes, showering and bathing, drinking, food preparation, watering lawns and gardens, and maintaining swimming pools. Some of these end uses are detectable (and measurable) while others are more difficult to gauge.



End uses of water for households in the U.S. in gallons per household per day and percent of indoor use<sup>[1]</sup>

Totals 137.7 gallons/day Source: Wikipedia



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# IS 24,000 GALLONS OF WATER PER MONTH TOO MUCH FOR A FAMILY OF THREE?



## Understanding Your Water Bill

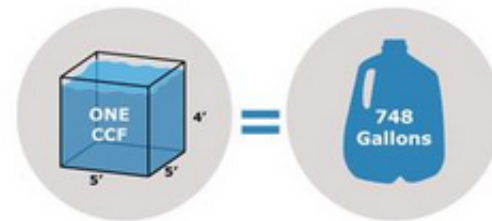


The first step in changing the way you use water in the future is by understanding how much water you use today. The best place to find this information is on your monthly water bill. Pull out your water bill and follow the steps below to learn more about it and your own water use.

## How much do you use?

Different utilities use different units for measuring water use. The most common units are centum cubic feet (CCF) and the gallon. A CCF also called an HCF (hundred cubic feet), represents one hundred cubic feet of water. The first "C" comes from the Roman word for hundred, "centum." This is the most common unit used by both water and natural gas utilities. But you may be more familiar with the other unit, the gallon. One CCF is equal to 748 gallons.

What does your usage mean? The average American uses around 88 gallons per day per person in the household. That means a family of four would use around 10,500 gallons in a 30-day period. But usage varies a great deal across the country, mostly because of differences in weather patterns. For example, water use tends to be higher in drier areas of the country that rely more on irrigation for outdoor watering than in wetter parts of the country that can rely on more rainfall.




Snipp  
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want to c



# Front Side of the City's Water & Sewer Bill

**City of Salem**  
Office of the Tax Collector  
93 Washington Street  
Salem, MA 01970  
000004 0001679



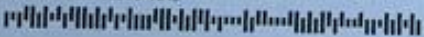
**City of Salem**  
**Water & Sewer Bill**  
You can pay your water & sewer bill  
on-line at [www.salem.com](http://www.salem.com)

*pd 8-16-20*

\*\*\*NEW WATER & SEWER RATES EFFECTIVE AUGUST 1, 2020\*\*\*

Account #	Bill #
[REDACTED]	1296626

5-DIGIT 01970  
HAYES JOHN T  
13 HANCOCK STREET  
SALEM MA 01970-4645



Questions regarding billing, please contact (978) 619-5674  
Email: [kmoran@salem.com](mailto:kmoran@salem.com)  
Questions regarding payments, please contact (978) 619-5621

Account #	Bill #	Parcel ID	Bill Date	Due Date	Part Due
[REDACTED]	1296626	330240	08/04/2020	09/08/2020	\$0.00
Service Location					Interest on Past Due
13 HANCOCK STREET					\$0.00
					Current Total
					\$177.70
					Total Amount Due
					\$177.70
					Discounted amount due if paid on or before 08/24/2020
					\$171.72
REPLACED METER USAGE					0

READING / USAGE CODES				DISTRICTS' ISSUE DATES	
A - ACTUAL REMOTE READING	O - ACTUAL MANUAL READING	DISTRICT A: BILLS ISSUED OCTOBER, JANUARY, APRIL, JULY			
E - SYSTEM ESTIMATE	T - ESTIMATE - NEEDS TROUBLESHOOTING	DISTRICT B: BILLS ISSUED AUGUST, NOVEMBER, FEBRUARY, MAY			
P - IN-HOUSE ESTIMATE	H - NON-RESPONSIVE - METER REPLACEMENT	DISTRICT C: BILLS ISSUED SEPTEMBER, DECEMBER, MARCH, JUNE			

SEE REVERSE SIDE FOR IMPORTANT INFORMATION

Water & Sewer FY 2021  
Customer Copy

My home's water use for the 2<sup>nd</sup> quarter of 2020: 1653 cubic feet



So JHayes' recent Water & Sewer Bill indicated his household use for the 3 month period 4/21 – 7/20/20 was 1653 cubic feet.

SO how many residents relate to 3 months of water use in c.f.? To convert to more user-friendly units they need to:

- 1) Divide 1653 by 3 to get usage/month in c.f. ; [551 c.f.]
- 2) Know that there are 748 gallons of water in 100 cubic feet of water (hcf);
- 3) Convert 551 c.f./month to gal/month:  $551/100 = 5.51\text{hcf}$   
 $5.51\text{ hcf} * 748\text{ gal/hcf} = 4,121.48\text{ gal/month}$
- 4) Divide the answer in #3 by 30 days to get usage per day in gallons; [137.38 gal/day for my home].  
[Note: our wintertime water use of 1436 c.f. is  $\approx 119$  gal/day]

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*pd  
8-16-20*



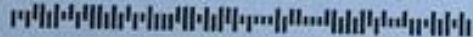
City of Salem  
Water & Sewer Bill

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Water & Sewer FY 2021  
Customer Copy

Account #	Bill #	Parcel ID	Bill Date	Due Date	Past Due			
	1296626	330240	08/04/2020	09/08/2020	\$0.00			
Service Location					Interest on Past Due			
13 HANCOCK STREET					\$0.00			
Service Type	Previous Read Date	Current Read Date	Read Code	Previous Reading	Current Reading	Usage (c.f.)	Charges	Current Total
Q W 5/8 RS	04/21/2020	07/20/2020	A	39471	41124	1653	\$59.84	\$177.70
Q S 5/8 RS			A			1653	\$117.86	Total Amount Due
								\$177.70
								Discounted amount due if paid on or before 08/24/2020
								\$171.72
REPLACED METER USAGE							0	

READING / USAGE CODES		DISTRICTS' ISSUE DATES
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P - IN-HOUSE ESTIMATE	H - NON-RESPONSIVE - METER REPLACEMENT	DISTRICT C: BILLS ISSUED SEPTEMBER, DECEMBER, MARCH, JUNE

SEE REVERSE SIDE FOR IMPORTANT INFORMATION

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93 Washington Street  
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00004 0001679

pd  
8-16-20



City of Salem  
Water & Sewer Bill  
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Questions regarding payments, please contact (978) 619-3621

Usage (gal/day)

Water & Sewer FY 2021  
Customer Copy

Account #	Bill #	Parcel ID	Bill Date	Due Date	Past Due			
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Service Location					Interest on Past Due			
13 HANCOCK STREET					\$0.00			
Service Type	Previous Read Date	Current Read Date	Read Code	Previous Reading	Current Reading	Usage (c.f.)	Charges	Current Total
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wasted space

SEE REVERSE SIDE FOR IMPORTANT INFORMATION

I submit that there is room to add a column for usage in the more user-friendly and relatable units of gal/day.

If there are any questions on your water usage or rates, please call the Water Department at (978) 619-5674, or email: kmoran@salem.com

- 22,300 ltr/30 days = 22.3 m<sup>3</sup>/month = 5,881.04 gal/mo. = 1

Questions on payments, please call the Collector's Office at (978) 619-5621

16,700 " " " " = 4,411.672 " = 14

Questions on water quality, please call the Salem Beverly Water Board at (978) 922-2600

11,200 " " " " = 2,958.73 " = 98

All bills for water furnished not paid within thirty(30) days shall be declared delinquent by the City Collector and shall bear interest at the rate of 14% per annum.

**Backflow Test Definitions**

- BF RP TEST = Backflow RP Test (High Hazard)
- BF DC TEST = Backflow DC Test (Low Hazard)
- BF PV TEST = Backflow RP Test (Irrigation)

Office Hours: Mon, Tue, Wed. 8:00AM - 4:00PM  
 Thursday 8:00AM - 7:00PM  
 Friday 8:00AM - NOON

CURRENT RATE STRUCTURE - EFFECTIVE 08/01/2020 (Per Hundred Cubic Feet)		
TYPE OF SERVICE	RESIDENTIAL	NON-RESIDENTIAL
Water	\$3.62	\$4.90
Sewer	\$7.13	
Monthly up to 25,000 C.F.		\$10.80
Quarterly up to 75,000 C.F.		\$13.83
Monthly over 25,000 C.F.		
Quarterly over 75,000 C.F.		

- 1) There are minimum charges for low/no usage which are calculated on meter size.
- 2) No allowance will be made for no use water & sewer unless service is shut off at the street.
- 3) The presence of a water service binds the owner of the premises, his agents or tenants to the rules and regulations of the department.

**SERVICE CHARGES FOR WATER SHUT-OFFS**

Please call DPS at 978-744-3302 for this service

Service charges for turning water on or off is \$25.00 between 7:00AM to 2:30PM Monday through Friday. After 2:30PM, evenings, weekends and holidays the shut-off charge is \$50.00. In addition after hours there is a minimum overtime fee of \$35.00 per hour with a minimum of 4 hours. Fees subject to change.

Back of the city's Water & Sewer Bill.



If there are any questions on your water usage or rates, please call the Water Department at

(978) 619-5674, or email: kmoran@salem.com 5,881.04 gal/mo. = 1

Questions on payments, please call the Collector's Office at (978) 619-5621  
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**\* Possible water use info here \***

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wasted space

**CURRENT RATE STRUCTURE - EFFECTIVE 08/01/2020**  
 Per Hundred Cubic Feet

TYPE OF SERVICE	RESIDENTIAL		NON-RESIDENTIAL
	RESIDENTIAL	RESIDENTIAL	
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Quarterly up to 75,000 C.F.			\$13.83
Monthly over 25,000 C.F.			
Quarterly over 75,000 C.F.			

This table could be smaller.

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The back of the water bill could have typical U.S. (or MA) water use in gallons/day for 2, 3, and 4-person households. This would allow residents to compare their use with average use. There could also be info as to winter vs. summertime water use.

## **Conclusions:**

1. Water usage units of cubic feet per 3 month period are difficult for a typical resident to relate to in terms of their average daily water use.
2. We have demonstrated that there is sufficient room on both the front and back sides of the City's current Water & Sewer Bill to add a column on the front for water use in gal/day and on the back side to offer information as to average household water use for 2, 3, and 4-person households.
3. When information is useful and relatable it has power to cause change and to promote sustainability.



## **Update for May 2021 Meeting of SERC:**

During the past year the City did a redesign of the quarterly Water & Sewer Bill. This new bill arrived to my home in late April 2021.

The front side of the bill now includes a “Consumption History” table which lists quarterly water usage for the past six quarters with NO mention of units. My household usage for the past quarter was 1311 with NO measurement units given.

The back side of the bill gives the current rate structure which is \$3.62 per hundred cubic feet (hcf) of water. So if I multiply my usage in hcf times the rate I get the water usage fee that is listed, confirming that my usage from 1/21/21 to 4/20/21 was indeed 1311 cubic feet of water.

**Front of newly redesigned City of Salem Water & Sewer Bill – mailed to residents April 2021**



**City of Salem**  
 Office of the Tax Collector  
 93 Washington Street  
 Salem, MA 01970  
 000005 0001685

**HOURS**  
 Monday - Wednesday 8:00 a.m. - 4:00 p.m.  
 Thursday 8:00 a.m. - 7:00 p.m.  
 Friday 8:00 a.m. - 12:00 p.m.

**WATER & SEWER BILL**

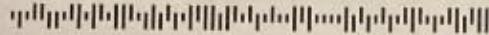
**Customer Copy**

Keep this portion for your records

You can pay your bill on-line at [www.salem.com](http://www.salem.com)

*pl  
5-8-21*

5-DIGIT 01970  
 HAYES JOHN T  
 SALEM MA 01970-4645



If you have received a manual estimate (T Read Code), please call the Water Department at 978-619-5674 to schedule an appointment to troubleshoot your water meter.

- Questions regarding billing: (978) 619-5674 or kmoran@salem.com
- Questions regarding payments: please contact (978) 619-5621

CUSTOMER NAME				SERVICE LOCATION			
HAYES JOHN T				<del>XXXXXXXXXX</del>			
BILL NUMBER	BILL DATE	Account #	Parcel ID #	Due Date			
1350469	05/04/2021	170020	330240	06/08/2021			
CHARGE DESCRIPTION	READ CODE	PREVIOUS READ DATE	CURRENT READ DATE	PREVIOUS READING	CURRENT READING	USAGE	CHARGE AMOUNT
QUARTERLY WATER .63 RESIDENT	A	01/21/2021	04/20/2021	44197	45508	1311 0	\$47.46
QUARTERLY SEWER 5/8 RESIDENT		01/21/2021	04/20/2021				\$93.47

**No units?!**  
*units??*

**No units?!**  
*units?*

CONSUMPTION HISTORY						
MM/YY	10/19	01/20	04/20	07/20	10/20	01/21
USAGE	1150	1436	1415	1653	1604	1469

READ CODE
A = Actual
E = System Estimate
O = Manual
T = Manual Estimate

Total Current Billing	\$140.93
Unpaid Balance Plus Interest	\$0.00
<b>Total Amount Due</b>	<b>\$140.93</b>
Discounted amount due if paid on or before 05/24/2021	\$136.18

Back side of City of Salem newly designed Water & Sewer Bill – mailed in April 2021:

If there are any questions on your water usage or rates, please call the Water Department at (978) 619-5674, or email: kmoran@salem.com

Questions on payments, please call the Collector's Office at (978) 619-5621

Questions on water quality, please call the Salem Beverly Water Board at (978) 922-2600

All bills for water furnished not paid within thirty(30) days shall be declared delinquent by the City Collector and shall bear interest at the rate of 14% per annum.

Plenty of space here for water usage info in average gallons per day for individual months.

<b>CURRENT RATE STRUCTURE - EFFECTIVE 08/01/2020</b>		
<b>(Per Hundred Cubic Feet)</b>		
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The next slide is an example of a home water use report for the town of Natick. It is not a bill but shows the water use for a single-family home in gallons/day for the past 12 months. It also presents water use info for similar size households (5+ occupants) with similar sized yards - along with water use for a highly efficient comparable home.

The town of Natick has a WaterSmart Program with info at: [natickma.watersmart.com](http://natickma.watersmart.com)



Natick WaterSmart Program  
 Department of Public Works Water Division  
 75 West St Natick, MA 01760

508-647-6557

water@natickma.org

## Your WaterScore

APR 2 TO MAY 1, 2019



### How do you compare to your neighbors?

Gallons Per Day (GPD)  
 91 CCF = 2,268 GPD



Your water use is compared to homes in Natick with 5+ occupants and a similar yard size.

## YOUR HOME WATER REPORT

THIS IS AN INFORMATIONAL REPORT AND NOT A BILL.

SERVICE ADDRESS: 44 HARWOOD RD  
 ACCOUNT NUMBER: 2193535



GO PAPERLESS. SEE ALL INFO & PRODUCTS AT:  
[natickma.watersmart.com](http://natickma.watersmart.com)

<RecipientID>natickma95207</RecipientID>



### Are we comparing you fairly?

Welcome to your first Water Report, Timothy.  
 Do you have **5+ occupants** and a **7,001 to 9,000 sq. ft. yard**? If not, correct us by completing your profile at: [natickma.watersmart.com](http://natickma.watersmart.com). Your comparisons and recommendations will be adjusted in future reports.



### Your use compared to last year

You are using **119% more** water than you did in the previous twelve-month period.





As Chair of SERC I extended an invitation to Mr. Wayne Castonguay, Executive Director of the Ipswich River Watershed Association, to attend and speak at our June 23 meeting of SERC. I informed him about my suggestions to redesign the City's Water & Sewer Bill such that relatable units of gallons per day are given. Here is Wayne's response to my email:

**Wayne Castonguay**

Tue, May 25, 4:12 PM (9 hours ago)



to me ▾

Hi john,

Yes I would be happy to speak on the 23<sup>rd</sup>. Do provide details. Second I applaud your water bill efforts. What you are trying to accomplish is really important and one of the most effective ways to change water use behavior. We also recommend a column that compares your use to the average adjusted use to others in your town like is commonly done for electric bills as a hugely effective form of "social marketing". We also advocate for monthly billing so you can relate usage to when it is actually used and season which in a city the size of Salem should be the norm. We need to get the two cities to pressure the water board to practice sustainability and implement basic conservation measures. The pumping and treating of water in our state has the 4<sup>th</sup> or 5<sup>th</sup> highest carbon footprint and the time has come that we view water conservation in the same way as other carbon-generating activities. Thanks for your efforts,

Wayne



# DCR Office of Water Resources

Focused on understanding and protecting the water resources of the Commonwealth for the people and habitats that depend on them

# Ipswich Targeted Watershed Project - Overview

Learn about the background and overview of the Ipswich Targeted Watershed Project.



## Ipswich River named among America's Most Endangered Rivers

*Excessive water withdrawals threaten regional water security*

Contacts:

Shanyn Viars, American Rivers, [sviars@americanrivers.org](mailto:sviars@americanrivers.org), 607-426-8283

Patrick Lynch, Ipswich River Watershed Association, [plynch@ipswichriver.org](mailto:plynch@ipswichriver.org), 978-412-8200

Washington, D.C. – American Rivers today named the Ipswich River among *America's Most Endangered Rivers®* of 2021, citing the grave threat that excessive water withdrawals pose to ecosystem health and regional water security. American Rivers and its partners called on the Massachusetts Department of Environmental Protection to better implement existing laws and improve regulations to avoid a water crisis that would be devastating for people, businesses and river health.

<https://endangeredrivers.americanrivers.org/>

## America's Most Endangered Rivers® of 2021

01: SNAKE RIVER

02: LOWER MISSOURI RIVER

03: BOUNDARY WATERS

04: SOUTH RIVER

05: PECOS RIVER

06: TAR CREEK

07: MCCLOUD RIVER

08: IPSWICH RIVER

09: RACCOON RIVER

10: TURKEY CREEK

This PowerPoint was presented via Zoom at the May 26<sup>th</sup> meeting of SERC. After discussion of this PowerPoint by SERC members and the public – the following general conclusions were reached in terms of billing statements for single-family homes with their own water meter:

1. We recommend that the City of Salem's Water & Sewer billing statement be redesigned to show water use data in gallons/day (gpd) per household.
2. We recommend that the data be presented monthly in units of gpd and that, as is done with monthly bills for electricity, that the past 12 or 13 months of monthly water use data be presented.
3. We recommend that the back of the billing statement include average water use information for 2-, 3-, and 4-person households in the U.S. (which is readily available) or for MA households if possible.
4. We recommend that these types of data be made available to multi-family dwellings and condos.

**CONTINUED ON NEXT SLIDE →**

5. This PowerPoint includes a sample residential water use report for the city of Natick that is well-designed and user-friendly, with units of gpd, and we recommend that the City strive to create such a report for its residents.
6. We recommend that the city coordinate with the City of Beverly, our “Resilient Together” collaborator and more importantly, as our joint user of water from the Ipswich River watershed via the Salem-Beverly Water Supply Board.
7. Finally, as the City makes progress on these recommendations, which SERC recommends it do with the utmost speed, that in the interim, the quarterly Water & Sewer Bill could contain an insert that presents water use information in gpd and could show the calculation method to convert quarterly water use data in cubic feet to gpd.
8. SERC believes that water use data needs to be presented in units that are easily related to - and that this is the starting point to help the City and its residents be more sustainable with its use of water – which is from a source that was ranked #8 in 2021 as one of the most stressed rivers in the United States.

Please contact John Hayes, Chair of SERC, if you have comments/suggestions regarding this PowerPoint and/or our efforts to encourage redesign of the City of Salem's Water & Sewer Bill to promote water literacy and more sustainable water use by residents and businesses.

Email: [jhayes@salem.com](mailto:jhayes@salem.com)  
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