



Water Conservation Opportunities for Individual Residences Serviced by On-Lot Wastewater Disposal Systems^a

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Wastewater Sources and Average Flow Rates

Reader questions:

1. How is water used in a typical household?
2. What amounts of water are involved in our normal daily activities?
3. How much wastewater is produced by these activities?
4. How practical is water conservation for our household?

Answers to the above questions provide the basis for this fact sheet. Information presented is for illustrative purposes only and not to replace the guidance and regulatory specifications of the Pennsylvania Department of Environmental Protection.

Water used in a typical household

Typical rates of water use for various household devices and appliances are presented in Table 1.

Table 1. Typical rates of water use for selected devices and appliances installed in residences.

Device/appliance	Units	Typical amount of water	Range
Automatic home type washing machine	gal/load	40	30-50
Automatic home type dishwasher	gal/load	6	4-8
Garbage disposal, home type unit	gal/person/day	2	1-3
Bath tub	gal/use	26	23-30
Shower head, 5/8 in. 25-ft pressure	gal/min	25	23-28
Wash basin	gal/use	2	1-2
Toilet, tank type	gal/use	5	4-6
Garden hose, 5/8 in, 25-ft pressure	gal/min	4	3-5

^aInformation from Tables 1 through 4 adapted from Criters, R.W. and G. Tchobanoglous, Small and Decentralized Wastewater Systems, W.C.B. McGraw-Hill, pages 169-183, 1998

The amounts of internal water used as a percentage of the total for a private residence served by an on-lot wastewater disposal system is presented in Table 2.

Table 2. Typical distribution* of internal water uses from residential sources.

Use	Percent of total%	
	Typical	Range
Bathing (bath/shower)	20	15-25
Dish washing	7	5-10
Clothes washing	20	15-25
Faucets	10	8-12
Kitchen food waste grinder	3	2-5
Toilets	30	20-40
Leakage	10	8-12
TOTAL	100	

*Without water conservation devices

Let's take a typical amount of water used daily in a residence that is not conserving water as an example:

Household activity	Water used (gallons/residence/day)
Dish washing	10
Laundry	25
Leakage	5
Subtotal	40

Personal activity	gallons/person/day	gallons/day (with three people)
Drinking and cooking	2	6
Oral hygiene	3	9
Bathing	25	75
Two toilet flushings	10	30
Subtotal	40	120

The amount of water used per day is the sum of household and personal activities. With three people, this amount is: $(40 \text{ gal/residence/day}) + (40 \text{ gal/person/day})(3 \text{ persons}) = 160 \text{ gal/residence/day}$

Note that when overnight guests or older children are temporarily staying in the house, the extra bathing, toilet uses and loads of laundry will greatly add to the amount of wastewater.

Wastewater Generated

The amounts of wastewater generated from several types of residences are presented in Table 3. These residences are served by a community or private water supply, a.k.a. “indoor plumbing,” where the wastewater amount is 60 to 80 percent of the water used, depending on the seasonal amounts used for landscaping needs outside of the residence.

Table 3. Typical rates of wastewater generated reported for selected types of residences.

Type of residence	Wastewater, typical (gallons/person/day)	Range (gallons/person/day)
New home	70	40-120
Older home	50	30-80
Summer cottage	40	30-60
Trailer park home	40	30-50

There are many factors to be considered when trying to get a good estimate of your wastewater flow. However, there are some rather straightforward ways of reducing residential water use as presented in Table 4. The water reductions that might be achieved are also provided.

Table 4. Selected flow-reduction devices, as compared to typical older devices.

Flow-reduction devices	Volume used(gallons/person/day)		Water saved (%)
	Before improvement	After improvement	
<i>Inexpensive devices:</i>			
Faucet aerator	5	4.5	10
Limiting flow shower head			
(3 gal/min)*	24	18	25
(0.5 gal/min)	24	4	83
Toilet dam	10	6	40
<i>More expensive devices</i>			
Low-flush toilets	10	2	80
Water efficient dishwasher	10	9	10
Water efficient clothes washer	25	23.5	6

* Assuming an eight-minute shower

Using the information from Table 4 for water saving in bathing and toilet use alone shows that significant reduction can be achieved.

Putting Water Conservation into Practice^b

Let's focus on a few simple steps that can reduce the amount of water used in a residence, and thereby decrease the amount of wastewater going to the on-lot system.

Leaks. Search for and eliminate leaky fixtures in the plumbing system.

- Toilets – add food coloring into the water tank and check the toilet bowl in 15 minutes or so. If the bowl water has coloring, there is a leak.
- Faucets – if you have a leaky faucet, chances are great that you can correct the situation with a new low-cost washer.

Changes to the fixtures. There are some further changes you can make in the fixtures to reduce water use by buying new water-saving products when they become available.

Behavior. There are a number of simple ways you and your family can reduce water use that require only a change in personal habits. For example, a 10-minute shower uses twice the amount of water as a 5-minute one. Don't run the clothes washer and dishwasher unless they contain a full load. Other suggestions are:

- ✓ Wash vehicles using a bucket and sponge - not a hose.
- ✓ Do not let the water run while brushing your teeth.
- ✓ If you irrigate your garden, use drip irrigation.
- ✓ Use garbage-grinders sparingly.
- ✓ Collect roof runoff to water your garden.

Appliances. If you are in the market for a new appliance, shop around and compare different models in terms of water use, electricity use, noise levels, etc. For example, invest in a front-loading clothes washer because they use less water than top-loading washers.

Other literature on the topic available from Penn State's College of Agricultural Sciences includes:

CAT D0670A – "Water Conservation with the Water Lion," the 4-H Water Project Unit 1, by Joy R. Drohan, William E. Sharpe, and Sanford S. Smith, 2001.

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^b Adapted from R. J. Perkins, Onsite Wastewater Disposal, Lewis Publishers, Chapter 9, Water Conservation, 1989

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