

# Point-of-Use Water Treatment and Bottled Water Guidance



This informational brochure was developed in support of RTI International's Clean Water for Carolina Kids study. If you have lead in your tap water, installing a point-of-use (POU) water treatment device can reduce the lead in your drinking water; this device can also be a cost-effective alternative to replacing pipes and fixtures. POU water treatment devices treat water from one tap—usually a kitchen sink—after the water has passed through all pipes and fixtures that could increase the water's lead content.

POU water treatment devices include faucet-mounted, countertop, or under-sink devices; pour-through pitchers; and refrigerator-installed water dispensers with filters. Activated carbon filtration is the most common type of POU water treatment. This type of filtration works by capturing contaminants as the water passes through the filter. Reverse osmosis (RO) is another common treatment type and removes contaminants by passing water through a membrane that most contaminants cannot pass through. RO devices often combine a membrane with pre- and post-membrane filtration. RO devices remove the widest range of contaminants; however, these devices can be expensive, have lower flow rates, and create wastewater that increases total water usage.

## Certification of POU Water Treatment Devices

Buy only water treatment devices and replacement filters that have been certified to remove lead to American National Standards Institute (ANSI) standards. Two organizations are accredited by ANSI to certify POU water treatment devices: NSF International and the Water Quality Association (WQA). Certified devices must reduce lead in water from up to 150 parts per billion (ppb) to 10 ppb or less. There are two standards, one for

carbon filters (NSF/ANSI 53) and one for reverse osmosis systems (NSF/ANSI 58). Make sure (1) the device you choose is certified by NSF or WQA to either standard 53 or 58, and (2) that lead is listed as one of the removed contaminants.

## The Importance of Replacing Filter Cartridges or RO Membranes

Carbon filters and RO membranes must be replaced regularly following the manufacturer's guidelines. Some contaminants are removed because they cannot fit through the pores in the filter or membrane. Over time, the pores will become clogged, and the flow rate will decrease. Other contaminants are removed because they stick to the surface of the filter. Once the filter surface is filled, the filter stops capturing these contaminants and they pass through into the tap water. It's not easy to tell when a filter surface becomes full. Finally, bacteria can colonize the filter cartridges over time and pass through into the treated water. For all these reasons, it's very important to replace the filter in your water treatment device as often as the manufacturer recommends. Many devices include a light that indicates when the filter needs to be changed. Make sure to use the manufacturer brand replacement filter because off-brand filter cartridges may not be certified.

Water Treatment Type	Example <sup>1</sup> with Model Number	Initial Cost Estimate <sup>2</sup>	Maintenance Cost/Gallon <sup>3</sup>	Filter Life in Gallons (Time) <sup>4</sup>	Advantages	Disadvantages
<b>Pour-Through Pitcher</b>	ZeroWater 10 Cup Pitcher Model Number: ZP-010	\$30–\$35	\$1.25–\$2.75	8–40 gal. (4–20 days)	<ul style="list-style-type: none"> <li>• Portable</li> <li>• No installation</li> <li>• Low initial cost</li> </ul>	<ul style="list-style-type: none"> <li>• Only one brand NSF-certified to remove lead</li> <li>• Shortest filter life</li> <li>• Highest maintenance cost</li> </ul>
<b>Faucet-Mount Filter</b>	Pur 3-Stage Advanced Faucet Water Filter Model Number: FM-3700	\$20–\$30	\$0.06–\$0.09	100–200 gal. (1–3 months)	<ul style="list-style-type: none"> <li>• Easy to install and use</li> <li>• Low initial cost</li> <li>• Switches between filtered and unfiltered water</li> </ul>	<ul style="list-style-type: none"> <li>• Low flow rate</li> <li>• Blocks entire faucet</li> <li>• May not fit some faucets</li> </ul>
<b>Refrigerator Filter</b>	Frigidaire PureSource 3 Model Number: WF3CB	\$0	\$0.05–\$0.15	150–400 gal. (2–6 months)	<ul style="list-style-type: none"> <li>• Built into refrigerator; no upfront cost</li> <li>• Filters the water for the ice dispenser also</li> </ul>	<ul style="list-style-type: none"> <li>• Low flow rate</li> <li>• Requires a refrigerator with a filtered water dispenser</li> </ul>
<b>Under-Sink Filter (Plumbed-in)</b>	3M Aqua Pure (Carbon) Model Number: AP-DWS1000  EcoWater ERO-375 Model Number: RO-90	\$75–\$450 (Carbon)  \$180–\$1,000 (RO)	\$0.08–\$0.10	100–625 gal. (1–6 months)	<ul style="list-style-type: none"> <li>• Fast flow rate</li> <li>• Option to use main faucet or create a separate tap</li> <li>• Activated carbon or reverse osmosis models available</li> </ul>	<ul style="list-style-type: none"> <li>• May have high initial cost</li> <li>• May require professional installation or maintenance</li> </ul>
<b>Countertop Filter (Connected to Sink Faucet)</b>	Aquasana Countertop Water Filter System Model Number: AQ-4000W	\$60–\$500	\$0.05–\$0.10	450–3,000 gal. (6–12 months)	<ul style="list-style-type: none"> <li>• Long filter life</li> <li>• Higher-end brands provide ambient, hot, cold, or sparkling water</li> </ul>	<ul style="list-style-type: none"> <li>• May have high initial cost</li> <li>• Takes up space on counter</li> </ul>
<b>Filtered Water Units/Bottle Filling Station</b>	Elkay EZH2O Bottle Filler Station, Filtered Single LZ Cooler Model Number: LZS8WSLP  Carolina Pure Water Purification Units (full purification systems)	\$1,000  N/A	\$0.02–\$0.03  \$35–\$70/month to rent, excluding ice	3,000 gal. (~12 months)	<ul style="list-style-type: none"> <li>• Fulfills any requirement to have a water fountain</li> <li>• Longest filter life</li> <li>• Lowest maintenance cost</li> </ul>	<ul style="list-style-type: none"> <li>• Highest initial cost</li> <li>• Not for residential use</li> </ul>
<b>Outside Water Hose</b>	Camco Premium Drinking Water Hose Model Number: 22853	\$25–\$30	\$0	Not applicable	<ul style="list-style-type: none"> <li>• NSF Certified</li> <li>• Low initial cost</li> <li>• No filters or maintenance</li> </ul>	<ul style="list-style-type: none"> <li>• Stiffer hose</li> <li>• Kinks easily</li> </ul>
<b>Portable Water Cooler (Stainless Steel)</b>	Sansone SA0010 Model Number: SA0010-1L	\$130–\$135	\$0	Not applicable	<ul style="list-style-type: none"> <li>• Portable water source</li> <li>• Cooler material is certified lead-free</li> </ul>	<ul style="list-style-type: none"> <li>• Product weight</li> <li>• Must ensure water source is good quality</li> </ul>

## Bottled Water

If your home or building's tap water has over 150 ppb lead, consider using bottled water. Otherwise, bottled water may not be the best option because of the high cost (\$1–\$2/gallon). If you choose to use bottled water, check the package or the manufacturer's website to ensure the provider meets Food and Drug Administration (FDA) standards. The FDA mandates that bottled water contain < 5 ppb lead. Preference is given to bottled water that has been purified. You can check the label to see if the water has been treated using technologies such as activated carbon or reverse osmosis. Spring water is typically not purified and water quality characteristics can vary based on the aquifer source and other factors. For long-term bottled water use, we recommend using 5-gallon jugs to lower costs and waste. Make sure to store all bottled water out of direct sunlight and away from heat to reduce leaching of plastic material into the water.

## Additional Resources

### Filtration

- NSF-Certified Devices:  
<http://info.nsf.org/Certified/DWTU>
- WQA-Certified Devices:  
<https://www.wqa.org/find-products#/>
- NSF's Lead Filtration Guide:  
[www.nsf.org/info/leadfiltrationguide](http://www.nsf.org/info/leadfiltrationguide)
- EPA's Water Filtration Guide:  
[https://www.epa.gov/sites/production/files/2015-11/documents/2005\\_11\\_17\\_faq\\_fs\\_healthseries\\_filtration.pdf](https://www.epa.gov/sites/production/files/2015-11/documents/2005_11_17_faq_fs_healthseries_filtration.pdf)
- Consumer Reports Water Filter Buying Guide:  
<http://www.consumerreports.org/cro/water-filters/buying-guide.htm>
- Environmental Working Group's Water Filter Buying Guide:  
<http://www.ewg.org/research/ewgs-water-filter-buying-guide>

## Bottled Water

- FDA Bottled Water Consumer Update:  
<https://www.fda.gov/ForConsumers/ConsumerUpdates/ucm203620.htm>

---

### More Information

Jennifer H. Redmon, MSES, MPA, CHMM  
Co-Project Director, Environmental Health Science  
[jredmon@rti.org](mailto:jredmon@rti.org)  
919.541.6245

Keith Levine, PhD  
Co-Project Director, Laboratory Science  
[levine@rti.org](mailto:levine@rti.org)  
919.541.8886

RTI International  
3040 E. Cornwallis Road, PO Box 12194  
Research Triangle Park, NC 27709-2194 USA

RTI 11135 R2 0917

- 
- <sup>1</sup> Example filters based on reviews available at Consumer Reports located at <http://www.consumerreports.org/cro/water-filters.htm> or NSF-certified filters <http://info.nsf.org/Certified/DWTU>.
  - <sup>2</sup> Approximate purchase cost; does not include installation cost.
  - <sup>3</sup> Approximate maintenance cost per gallon based on the cost and filter life of replacement filter cartridges or usage.
  - <sup>4</sup> From NSF-certified filters listing: [http://info.nsf.org/Certified/DWTU/listings\\_leadreduction.asp](http://info.nsf.org/Certified/DWTU/listings_leadreduction.asp) or manufacturer website. The time recommendations are based on household use; child care centers may need to replace the filters more often if the device is filtering water for more than 4–5 people. Filter lifetime will decrease with increased water hardness (i.e., dissolved solids in the water) or higher than household-level usage.



RTI International is an independent, nonprofit research institute dedicated to improving the human condition. Clients rely on us to answer questions that demand an objective and multidisciplinary approach—one that integrates expertise across the social and laboratory sciences, engineering, and international development. We believe in the promise of science, and we are inspired every day to deliver on that promise for the good of people, communities, and businesses around the world. For more information, visit [www.rti.org](http://www.rti.org).

RTI International is a registered trademark and a trade name of Research Triangle Institute.  
The RTI logo is a registered trademark of Research Triangle Institute.

