



2016

Drinking Water Quality Report

Featuring data collected in 2015

This report is produced for you as a requirement of the Federal Safe Drinking Water Act. NOTE: Industrial and commercial customers, including hospitals, medical centers and health clinics, please forward this report to your Environmental Compliance Manager.

PWD's Public Water System Identification #PA1510001



PHILADELPHIA
WATER
EST. 1801



Please share this report with all people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools and businesses). You can do this by posting this notice in a public place or distributing copies by hand and mail.

To receive a printed copy of this report, please email: waterquality@phila.gov.

Para obtener una copia del informe en Español sobre los resultados más recientes de la calidad del agua publicado por el Departamento de Agua de Philadelphia, llame al 215-685-6300.

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Philadelphia Water is an active member of:

- American Water Resources Association
- American Water Works Association
- Partnership for Safe Water
- American Public Works Association
- Association of Metropolitan Water Agencies
- Clean Water American Alliance
- National Association of Clean Water Agencies
- Partnership for the Delaware Estuary
- Schuylkill Action Network
- Schuylkill River Restoration Fund
- Tookany/Tacony-Frankford (TTF) Watershed Partnership
- U.S. Water Alliance
- Water Environment Federation
- Water Environment Research Foundation
- Water Research Foundation

PHILADELPHIA WATER

A MESSAGE FROM PHILADELPHIA WATER'S COMMISSIONER

Providing safe, top quality drinking water for our 1.5 million customers requires partnerships that extend from the Delaware River's Catskill Mountain headwaters to the tap at your kitchen sink.

Our annual Drinking Water Quality Report is a testament to the incredible dedication that motivates Philadelphia Water's team of 2,000 employees—scientists, engineers, treatment plant operators, water main and sewer repair workers, educators and more, all working to make sure you have constant access to safe water.

Thanks to national and local news coverage, Americans today are talking about and thinking about drinking water quality on a level not seen for decades. We welcome that conversation and wish to assure our customers that we hold our pledge to provide safe, high quality water as our most sacred bond with the citizens we serve. We work closely with the Philadelphia Department of Public Health and participate in research conducted by national water research foundations to ensure we are taking advantage of the best science and public health resources available.

The water that leaves our treatment plants is better than what is required by the U.S. Environmental Protection Agency (EPA). Our water is monitored 24 hours a day, 7 days a week to ensure that it consistently remains of the highest quality. Our team of experienced scientists and engineers test and treat our water for nearly 100 chemicals, and this annual Drinking Water Quality Report explains what we look for, and what we found.

This report, published in the spring of 2016, includes water quality information for the 2015 calendar year. The EPA requires all water utilities to produce and distribute water quality reports on an annual basis.

We hope you take the time to look at all the information in the report. Please contact us if you have any questions. If you'd like to be a part of keeping our water and waterways clean, visit our website to find additional resources and learn about how you can volunteer with a number of local environmental groups dedicated to protecting our watersheds.



Debra McCarty
Water Commissioner

PWD's drinking water quality is better than all drinking water standards developed by the EPA to protect public health.



PEOPLE WITH SPECIAL HEALTH CONCERNS

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons, such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS and other immune system disorders, some elderly and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers.

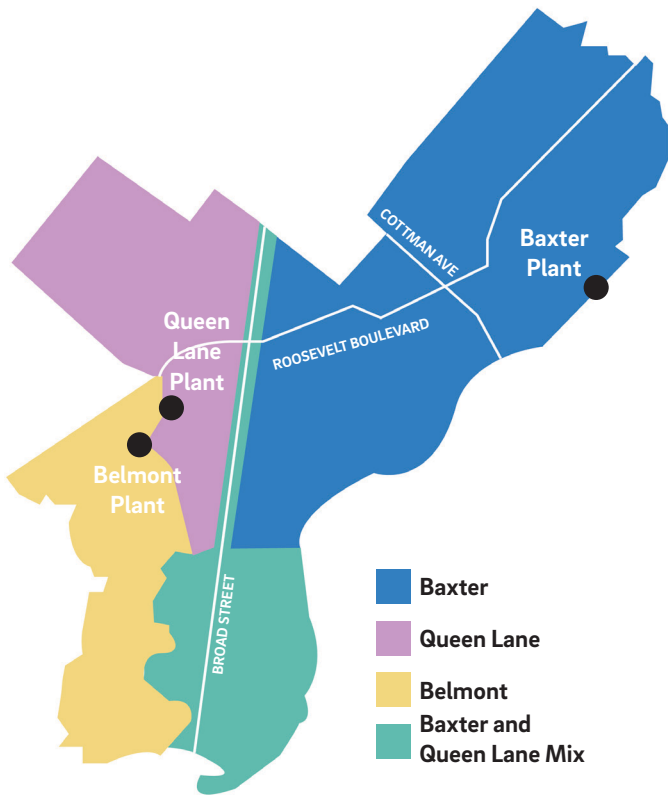
U.S. Environmental Protection Agency (EPA)/Centers for Disease Control (CDC) guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* and other microbial contaminants are available from the Safe Drinking Water Hotline: 800-426-4791.

WHERE DOES PHILADELPHIA'S DRINKING WATER COME FROM?

Philadelphia's water comes from the Schuylkill and Delaware rivers. Each river contributes one-half of the City's overall supply and approximately 250 million gallons of high-quality drinking water is produced for our customers on a daily basis.

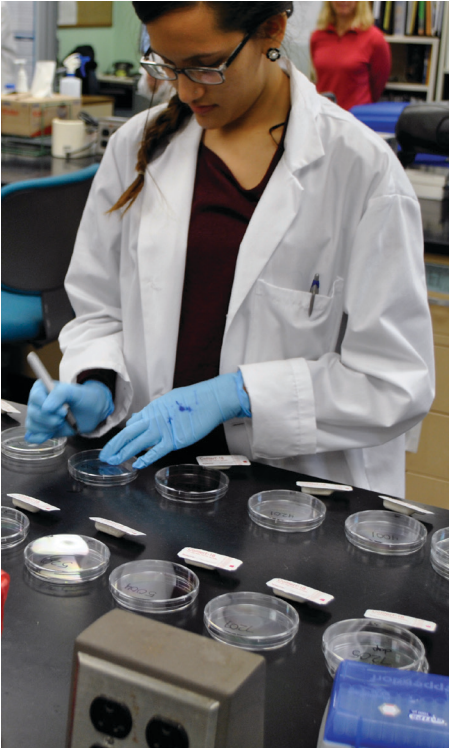
Rivers are surface water supplies. Philadelphia does not use groundwater.

Philadelphia Water (PWD) has three water treatment plants that process untreated river water. Depending on where you live, you receive drinking water from one of these three plants. The Queen Lane Plant is located in East Falls and its water comes from the Schuylkill River; its intake is located along Kelly Drive. The Belmont Plant is located in Wynnefield and its water also comes from the Schuylkill River; its intake is located along Martin Luther King Jr. Drive. The Baxter Plant is located in Torresdale and its water comes from the Delaware River; its intake is located at the plant on the Delaware River.



Philadelphia is located in the Delaware River Watershed, which begins in New York State and extends 330 miles south to the mouth of the Delaware Bay. The Schuylkill River is part of the Delaware River Watershed.

SAFEGUARDING THE WATER YOU DRINK



Today, Philadelphia enjoys watersheds that are cleaner and healthier than they have been in well over a century.

HOW DO DRINKING WATER SOURCES BECOME POLLUTED?

Across the nation, rivers, lakes, streams, ponds, reservoirs, springs and wells are sources of drinking water (both tap water and bottled water). Rain and melting snow travels over the surface of the land or through the ground, dissolving naturally occurring minerals and picking up substances resulting from animal and human activity and carrying these pollutants to our drinking water sources.

Contaminants that may be present in source water include:

- Microbial contaminants, such as viruses and bacteria, from sewage treatment plants, septic systems, agricultural livestock operations and wildlife.
- Inorganic contaminants, such as salts and metals can be naturally occurring or come from urban stormwater runoff (streets and parking lots), industrial or domestic wastewater discharges, oil and gas production, mining or farming.
- Pesticides and herbicides from a variety of sources such as agriculture, urban stormwater runoff and residential uses.
- Organic chemical contaminants, including synthetic and volatile organic chemicals, are byproducts of industrial processes and petroleum production. They can also come from gas stations, urban stormwater runoff and septic systems.
- Radioactive contaminants can be naturally occurring or can come from oil and gas production, mining activities or medical use.

At their sources, the Delaware and Schuylkill Rivers are generally clean. But as the rivers flow downstream, they pick up contaminants from many sources – stormwater runoff washes pollutants on the land into the rivers, and communities and industries discharge used water back into the rivers. Today, Philadelphia enjoys watersheds that are cleaner and healthier than they have been in well over a century. Although we have seen a dramatic improvement in the water quality of the City's two major rivers since the passage of the Federal Clean Water Act in the early 1970s, there is still more work that needs to be done to protect our drinking water sources from pollution.

In order to ensure that tap water is safe to drink, the EPA has regulations that limit the amount of certain contaminants in water provided by water suppliers. The Food and Drug Administration establishes limits for contaminants in bottled water that must provide the same protection for public health.

Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the EPA's Safe Drinking Water Hotline, 800-426-4791, or from their website: www.epa.gov/safewater.

LEAD IN DRINKING WATER

Philadelphia Water delivers safe, clean water to our customers' homes and businesses every day. Our system does not contain lead, and we work hard to make sure the drinking water we deliver is lead-free.

However, every house is different, and ensuring quality tap water is a responsibility Philadelphia Water shares with individual customers like you. To make sure the water we deliver to you stays safe, you should take care of your home's plumbing and know what your pipes and fixtures are made from.

An estimated 10 percent of homes in Philadelphia may be connected to City water mains by a pipe made from lead. While lead was once a common building material, today we know that it is a toxic metal that can have health impacts on people and pets.

If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from material and components associated with service lines and home plumbing. Philadelphia Water is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components. If you haven't turned on your tap for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking and cooking. If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline or at: www.epa.gov/safewater/lead.

QUICK TIPS:

Worried about lead in water? Whether you have lead pipes or not, follow these simple tips:

- **NEVER** drink hot water from the tap or use that water for cooking. Hot water heaters aren't made for drinking water.
- Run the water for few minutes before drinking if it hasn't been used for a few hours. You should feel the water get nice and cold.
- Take the time to clean the screen inside your kitchen sink and other sinks you drink from. This smart habit can get rid of any loose dirt that may build up. See the next page for more.

HOW WE MANAGE LEAD

We continuously monitor drinking water to make sure our treatment helps to keep lead out of water in buildings with lead plumbing. As a part of our testing efforts, we ask Philadelphia households with lead water pipes to participate in our free tap water sampling program. Every three years, Philadelphia Water samples at least 50 homes with lead plumbing and tests the water for lead levels. These samples are a required part of the EPA's Lead and Copper Rule, which was created in 1992 to make sure that corrosion treatment is working.

To date, sampling results show that our treatment is controlling corrosion in our customers' plumbing. Sampling was completed most recently in 2014. See the chart on page 14 for the results.

EDUCATION

We are committed to helping our customers get the lead out! Our website has many tips and tools for customers worried about plumbing made from lead.

Visit www.phila.gov/water/lead for more information on:

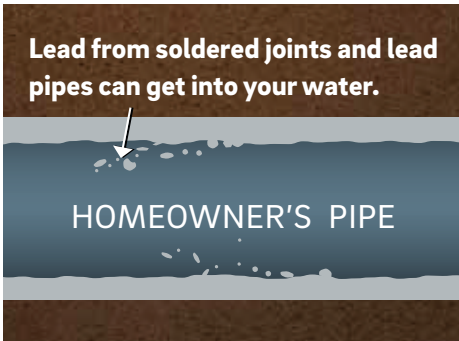
- Always getting fresh drinking water
- Checking your home's water pipe for lead
- Taking care of your household plumbing
- NEW programs to help customers replace lead pipes

Remember: Having lead plumbing in your home does not mean you have high lead levels in your water. Our treatment program reduces the chance of lead leaching into the water from pipes. If you are concerned about lead plumbing in your home and would like us to check your water, call our hotline at 215-685-6300 to schedule an appointment.

We are committed to reducing the effects of plumbing corrosion and lead levels in water. Additional information is available from EPA's Safe Drinking Water Hotline at 800-426-4791 or from their website at water.epa.gov/drinking/info/lead.

See the tips on the following page to learn about cleaning the faucet screens/aerators in your home!

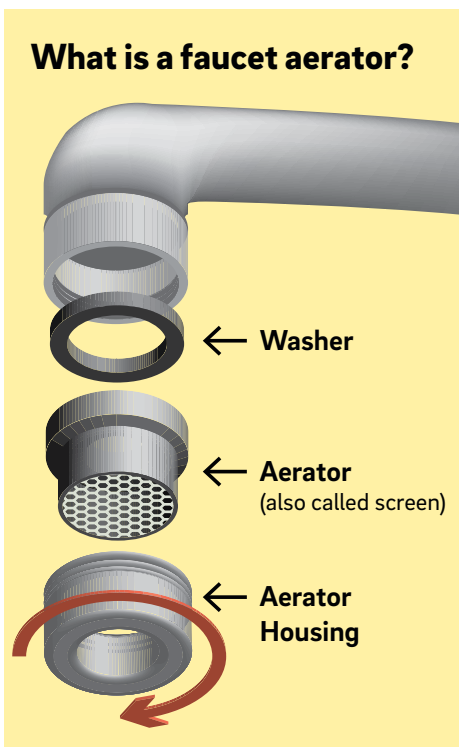
CLEANING FAUCET AERATORS



As water stands in your home's plumbing, lead from the soldered joints and old lead pipes can get into your water. Other debris can build up on the aerator, too. It's important to clean faucet aerators and screens to remove any debris from them.

How often should I clean aerators?

Clean all aerators once a month for 6 months, then twice a year, spring and fall. You should also replace aerators each year. You can buy them at your local hardware or home improvement store.



It's a device attached to the tip of a faucet. It saves water, filters out debris and prevents water from splashing. As water flows through the screen, it mixes with air and flows more evenly.

Instructions for Cleaning Aerators

You will need:

- Rag
- Masking tape
- Wrench or Pliers
- Old toothbrush
- White vinegar
- Small plastic tub
- Extra aerators
- Extra washers

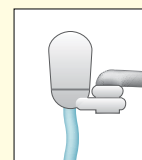
If your faucet has an aerator that you can take off, follow these easy steps:

- Place a rag in the sink drain in case you drop any pieces.
- If you need to use a wrench or pliers, wrap masking tape around the tips of the wrench or pliers, or on the aerator. Using tape will keep you from scratching the aerator.
- Unscrew the aerator.
- Separate each part— aerator housing, aerator and rubber washer.
- Remove small bits on the screen and other parts.
- Soak the parts in white vinegar for a few minutes.
- Scrub them with a brush.
- If the aerator and rubber washer are in poor condition, replace them.
- Put the aerator parts back together.
- Screw the aerator back onto the faucet.
- Repeat these steps for all faucets.

Troubleshooting

Can't find the aerator?

Some faucets have hidden aerators. If you have a hidden aerator, follow the manufacturer's instructions.



If you have a water filter attached to a faucet, the faucet will not have an aerator.

PARTNERSHIP FOR SAFE WATER



Why is chlorine used to disinfect the drinking water?

State and federal laws require the disinfection of all public water supplies. EPA and health agencies recognize that using chlorine is the most effective way to protect public health from disease-causing organisms that can be found in rivers and streams. However, chlorine can chemically react with natural materials in rivers to form disinfection by products, such as trihalomethanes and haloacetic acids. We have been adjusting our treatment process over the years to reduce this chemical reaction, but we also ensure that the treated water that is distributed through the City's water mains to homes has a "chlorine residual." This residual continues to protect your water against bacteria and other organisms on its journey to your home's tap. We use sodium hypochlorite, a safer form of chlorine similar to household bleach, to disinfect the water at our treatment plants.

Philadelphia Water consistently produces high quality drinking water, achieving Partnership for Safe Water quality standards that are far stricter than state and federal water quality regulatory requirements. Philadelphia Water voluntarily adopted the stricter water treatment quality goals as a member of the Partnership for Safe Water in 1996. The average turbidity level (measure of water clarity) of Philadelphia's drinking water has been at or below 0.06 nephelometric turbidity units (NTU) since 1998.

The turbidity of Philadelphia's drinking water in 2015 is 84 percent lower than the maximum of 0.30 NTU allowed by state and federal regulations and is 50 percent less than the Partnership for Safe Water maximum turbidity goal of 0.10 NTU.

In 2013, the Baxter, Queen Lane and Belmont Water Treatment Plants were honored by EPA and DEP with the Partnership for Safe Water 15-Year Director's Award in recognition of Philadelphia Water's decade-long commitment to achieving and maintaining the highest possible drinking water quality.

Philadelphia Water extended its participation in the Partnership for Safe Water initiative by becoming a charter member in the new Distribution System Optimization Program. This self-assessment initiative extends our focus from the treatment process to ensuring delivery of high quality water by maintaining distribution system integrity.

The Partnership for Safe Water is a voluntary optimization program conceived and initiated by the EPA, the American Water Works Association, the Association of Metropolitan Water Agencies and advocated by the Pennsylvania Department of Environmental Protection. Pennsylvania leads the nation in participation in this program and Philadelphia Water is one of Pennsylvania's leaders.

CRYPTOSPORIDIUM AND GIARDIA

***Cryptosporidium* and *Giardia* are microscopic organisms found in rivers and lakes throughout the United States.** If ingested, *Cryptosporidium* and *Giardia* can cause diarrhea and abdominal cramps. However, these are also symptoms of intestinal diseases caused by many bacteria, viruses and parasites. Most healthy individuals can overcome such illnesses within a few weeks; however, immuno-compromised individuals are at a greater risk of developing a life-threatening illness and are encouraged to consult with their doctors about taking appropriate precautions to avoid infections.

PWD carefully monitors water treatment processes and works closely with the Philadelphia Department of Public Health to ensure that our tap water is free of pathogens that can be found in rivers. The Department of Public Health monitors local hospital records in real time for symptoms consistent with

waterborne illnesses and would contact Philadelphia Water if there were any concerns that the drinking water may be contributing to illnesses.

Philadelphia Water is one of the nation's leaders in *Cryptosporidium* research and was one of the first utilities in the U.S. to monitor for the organism. Philadelphia Water's Office of Watersheds manages a source water protection program that looks at protecting the rivers in the City as well as farther upstream of Philadelphia. PWD continues source water *Cryptosporidium* research, in collaboration with Lehigh University. By identifying sources of *Cryptosporidium* in the watershed, PWD is taking a proactive approach in improving our rivers' water quality. Please refer to page 16 for results from 2015 *Cryptosporidium* monitoring.

PHARMACEUTICALS AND SOURCE WATER

Pharmaceuticals get into drinking water because people use both prescription and over-the-counter medications. Only a portion of these substances is absorbed into the bloodstream. The rest is excreted by the body, making its way through wastewater treatment plants and back into the waterways that serve as our drinking water sources.

You can help keep unused pharmaceuticals out of the water supply by paying attention to how you dispose of unused medications. Look for take-back programs that may be established near you. The Drug Enforcement Agency (DEA) sponsors national take-back programs in coordination with State and local law enforcement agencies.

National take-back programs provide opportunities for the public to surrender expired, unwanted or unused pharmaceuticals and other medications to law enforcement officers for proper disposal. To find out about future take-back events, visit DEA's website at www.deadiversion.usdoj.gov/drug_disposal/takeback.

PROPERLY DISPOSE OF YOUR MEDICATIONS AT HOME!



- 1. Protect Your Info**
Peel off the label, or cross out all your personal information with a marker.



- 2. Seal the Meds**
Put the pills or liquids in another container, then cover with items like coffee grounds or kitty litter.

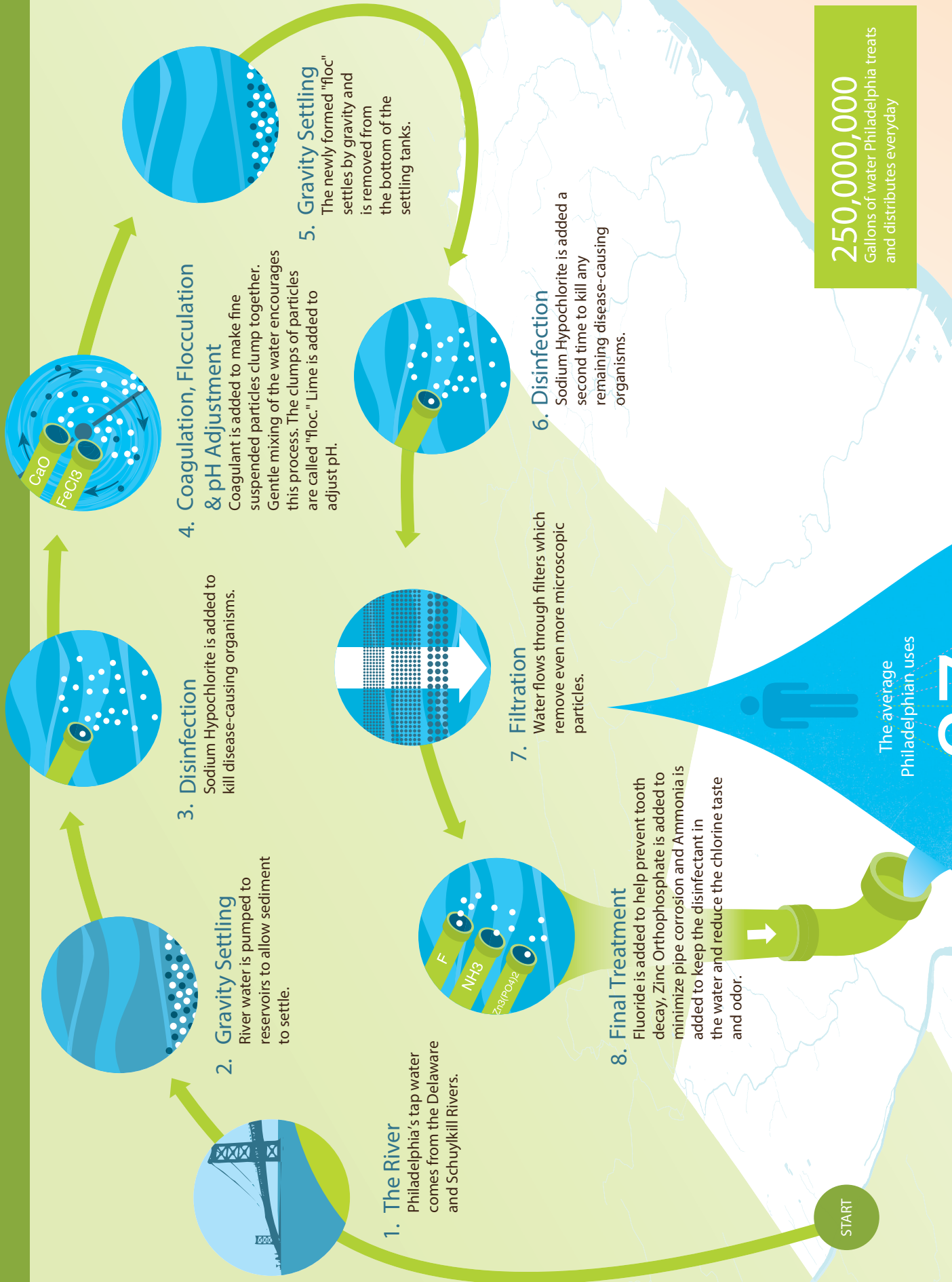


- 3. Trash It!**
Toss sealed meds in your household trash.

To learn more about pharmaceuticals and drinking water, view the short instructional video developed by Philadelphia Water and the Philadelphia chapter of Physicians for Social Responsibility: www.vimeo.com/78005190

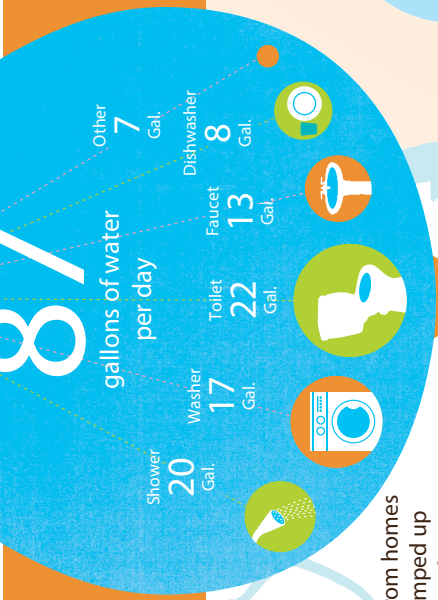
How Do We Make Water Drinkable?

Like the majority of water utilities in the U.S., we use a multi-step treatment process at all three of our drinking water treatment plants. This Water Treatment Process diagram provides a brief description of drinking water treatment in Philadelphia.



How Do We Process Wastewater?

After water is used, PWD is responsible for cleaning it before returning the water to the river. This is the Wastewater Treatment Process. We return about 98% of the water that we withdraw for our use to the river.



1. Collection & Pumping

Wastewater flows from homes by gravity and is pumped up to the treatment plant from underground.

2. Screening

Debris and trash are removed from the wastewater.

3. Grit Removal

Small debris, like sand and gravel, is removed by gravity.

4. Gravity Settling

Suspended solids settle to the bottom by gravity and oil and grease rise to the top.

471,000,000

Gallons of wastewater/stormwater Philadelphia processes a day

5. Aeration & Biological Reduction

Air and waste-eating microbes are added. The microbes remove remaining contaminants.

6. Gravity Settling

Living microbes settle by gravity to be recycled to the Aeration Tanks. Excess microbes are sent to the digesters.

7. Disinfection

Sodium Hypochlorite is added to kill any remaining disease-causing organisms.

8. Effluent Discharge

The treated water is returned to the river.

FINISH

Settled solids travel through digesters which produce natural gas and biosolids that are recycled as fertilizer.

WHAT DO WE LOOK FOR?

Public Drinking Water Systems monitor their treated drinking water for approximately 100 regulated contaminants. These regulatory parameters are defined within federal rules such as the Total Coliform Rule, Surface Water Treatment Rule, Disinfectants and Disinfection Byproducts Rules, Lead and Copper Rule and the Radionuclides Rule. We monitor for the regulated parameters listed below. Tables on pages 14-17 summarize monitoring results for parameters found at detectable levels. Please see a glossary of terms and abbreviations on page 13.

Inorganic Chemicals:

Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Cyanide Free, Fluoride, Mercury, Nickel, Selenium, Thallium

Synthetic Organic Chemicals:

Alachlor, Atrazine, Benzopyrene, Carbofuran, Chlordane, Dalapon, Di(ethylhexyl)adipate, Di(ethylhexyl)phthalate, Dibromochloropropane, Endothall, Ethylene Dibromide, Hexachlorocyclopentadiene, Lindane, Methoxychlor, Oxamyl, PCBs Total, Pentachlorophenol, Picloram, Simazine

Volatile Organic Chemicals:

Benzene, Carbon Tetrachloride, 1,2-Dichloroethane, o-Dichlorobenzene, p-Dichlorobenzene, 1,1-Dichloroethylene, cis-1,2-Dichloroethylene, trans-1,2-Dichloroethylene, Dichloromethane, 1,2-Dichloropropane, Ethylbenzene, Monochlorobenzene, Styrene, Tetrachloroethylene, Toluene, 1,2,4-Trichlorobenzene, 1,1,1-Trichloroethane, 1,1,2-Trichloroethane, Trichloroethylene, o-Xylene, m,p-Xylenes

Appealing to Your Senses

We also test for aluminum, chloride, color, iron, manganese, odor, pH, silver, sulfate, surfactants, total dissolved solids and zinc to ensure that your water meets all water quality taste and odor guidelines. This is so that your water looks, tastes and smells the way it should.

Temperature and Cloudiness

The temperature of the Schuylkill and Delaware Rivers varies seasonally from approximately 34 degrees to 82 degrees Fahrenheit. Philadelphia Water does not treat the water for temperature. Cloudiness in tap water most commonly happens in the winter, when the cold water from the water main is warmed up quickly in household plumbing. Cold water and water under pressure can hold more air than warmer water and water open to the atmosphere. When really cold winter water comes out of your tap, it's simultaneously warming up and being relieved of the pressure it was under inside the water main and your plumbing. The milky white color is actually just tiny air bubbles. If you allow the glass to sit undisturbed for a few minutes, you will see it clear up gradually.

Parameters listed below are not part of EPA's requirements and are provided for information purposes.

SODIUM IN TAP WATER			
	Baxter WTP One Year Average	Belmont WTP One Year Average	Queen Lane WTP One Year Average
Average (ppm)	29 ppm	46 ppm	50 ppm
Average (mg in 8 oz. glass of water)	7 mg	11 mg	12 mg
Range (ppm)	18 - 57 ppm	20 - 107 ppm	21 - 111 ppm
Range (mg in 8 oz. glass of water)	4 - 13 mg	5 - 25 mg	5 - 26 mg

HARDNESS IN TAP WATER			
	Baxter WTP One Year Average	Belmont WTP One Year Average	Queen Lane WTP One Year Average
Average	101 ppm or 6 gpg	146 ppm or 9 gpg	164 ppm or 10 gpg
Minimum	71 ppm or 4 gpg	101 ppm or 6 gpg	91 ppm or 5 gpg
Maximum	178 ppm or 10 gpg	182 ppm or 11 gpg	216 ppm or 13 gpg

Hardness defines the quantity of minerals, such as calcium and magnesium, in water. These minerals react with soap to form insoluble precipitates and can affect common household chores such as cooking and washing. Philadelphia's water is considered "medium" hard.

ALKALINITY IN TAP WATER			
	Baxter WTP One Year Average	Belmont WTP One Year Average	Queen Lane WTP One Year Average
Average	39 ppm	69 ppm	69 ppm
Minimum	25 ppm	46 ppm	32 ppm
Maximum	55 ppm	88 ppm	88 ppm

GLOSSARY

Some of the words we use in the following charts may not be familiar to you. Here are definitions of technical and other terms.

Action Level: The concentration of a contaminant which, if exceeded, triggers treatment or other requirements that a water system must follow. The action level is not based on one sample; instead, it is based on many samples.

Alkalinity: A measure of the water's ability to resist changes in the pH level and a good indicator of overall water quality. Although there is no health risk from alkalinity, we monitor it to check our treatment processes.

E. coli (Escherichia coli): A type of coliform bacteria that is associated with human and animal fecal waste.

gpg (grains per gallon): A unit of water hardness. One grain per gallon is equal to 17.1 parts per million.

MCL (Maximum Contaminant Level): The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as feasible using the best available treatment technology.

MCLG (Maximum Contaminant Level Goal): The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety.

mg/L (Milligrams per liter): One milligram per liter is equal to one part per million.

MRDL (Maximum Residual Disinfection Level): The highest level of disinfectant that is allowed in drinking water. The addition of a disinfectant is necessary for the control of microbial contaminants.

MRDLG (Maximum Residual Disinfection Level Goal): The level of a disinfectant in drinking water below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.

Minimum Residual Disinfectant Level: The minimum level of residual disinfectant required at the entry point to the distribution system.

NTU (nephelometric turbidity units): Turbidity is measured with an instrument called a nephelometer. Measurements are given in nephelometric turbidity units.

Pathogens: Bacteria, virus, or other microorganisms that can cause disease.

pCi/L (Picocuries per liter): A measure of radioactivity.

ppm (parts per million): Denotes 1 part per 1,000,000 parts, which is equivalent to two thirds of a gallon in an Olympic-sized swimming pool.

ppb (parts per billion): Denotes 1 part per 1,000,000,000 parts, which is equivalent to half a teaspoon in an Olympic-sized swimming pool.

µg/L (Microgram per liter): One microgram per liter is equal to one part per billion.

ppt (parts per trillion): Denotes 1 part per 1,000,000,000,000 parts, which is equivalent to one drop in 20 Olympic-sized swimming pools.

SOC (Synthetic Organic Chemical): Commercially made organic compounds, such as pesticides and herbicides.

Total Coliform: Coliforms are bacteria that are naturally present in the environment. Their presence in drinking water may indicate that other potentially harmful bacteria are also present.

THAAs (Total Haloacetic Acids): A group of chemicals known as disinfection byproducts. These form when a disinfectant reacts with naturally occurring organic and inorganic matter in the water.

TOC (Total Organic Carbon): A measure of the carbon content of organic matter. This measure is used to indicate the amount of organic material in the water that could potentially react with a disinfectant to form disinfection byproducts.

TTHMs (Total Trihalomethanes): A group of chemicals known as disinfection byproducts. These form when a disinfectant reacts with naturally occurring organic and inorganic matter in the water.

Treatment Technique: A required process intended to reduce the level of a contaminant in drinking water.

Turbidity: A measure of the clarity of water related to its particle content. Turbidity serves as an indicator for the effectiveness of the water treatment process. Low turbidity measurements, such as ours, show the significant removal of particles that are much smaller than can be seen by the naked eye.

VOC (Volatile Organic Chemicals): Organic chemicals that can be either man-made or naturally occurring. These include gases and volatile liquids.

WTP: Water Treatment Plant

2015 DRINKING WATER QUALITY RESULTS

Listed on pages 14-17 are our Drinking Water Quality Results for 2015. All results are better than the recommended federal levels designed to protect public health. By reporting these results in the tables below, we are meeting a requirement of the EPA. Please see the glossary on page 13 for definitions of abbreviations used in the tables. Some contaminants may pose a health risk at certain levels. Others, such as turbidity, are used as indicators for treatment plant performance. For information about potential risks, please visit our website at www.phila.gov/water, or call us at 215-685-6300. We will be happy to mail them to you.

LEAD AND COPPER - Tested at Customers' Taps - Testing is done every 3 years. Most recent tests were done in 2014.						
	EPA's Action Level - for a representative sampling of customer homes	Ideal Goal (EPA's MCLG)	90% of PWD customers' homes were less than	Number of homes considered to have elevated levels	Violation	Source
Lead	90% of homes must test less than 15 ppb	0 ppb	5.0 ppb	7 out of 134	No	Corrosion of household plumbing; Erosion of natural deposits
Copper	90% of homes must test less than 1.3 ppm	1.3 ppm	0.31 ppm	0 out of 134	No	Corrosion of household plumbing; Erosion of natural deposits; Leaching from wood preservatives

BACTERIA IN TAP WATER- Tested throughout the Distribution System. Over 380 samples collected throughout the City every month.						
	Highest Level Allowed (EPA's MCL)	Ideal Goal (EPA's MCLG)	Highest Monthly % or Yearly Total of Positive Samples	Monthly Range (% or #)	Violation	Source
Total Coliform	5% of monthly samples are positive*	0	1.20%	0 - 1.20%	No	Naturally present in the environment
Fecal Coliform or E. coli		0	0	0	No	Human or animal fecal waste

*Every sample that is positive for total coliforms must also be analyzed for either fecal coliforms or E. coli. If a system has two consecutive total coliform positive samples, and one is also positive for E. coli, then the system has an acute MCL violation.

SYNTHETIC ORGANIC CHEMICALS (SOC)						
Chemical	EPA's MCL	EPA's MCLG	Highest Result	Yearly Range	Violation	Source
Atrazine	3 ppb	3 ppb	0.18 ppb	0 - 0.18 ppb	No	Runoff from herbicide used on row crops

TOTAL CHLORINE RESIDUAL - Continuously Monitored at Water Treatment Plants.

Sample Location	Minimum Disinfectant Residual Level Allowed	Lowest Level Detected	Yearly Range	Violation	Source
Baxter WTP	0.2 ppm	1.91 ppm	1.91 - 3.40 ppm	No	Water additive used to control microbes
Belmont WTP		1.54 ppm	1.54 - 3.01 ppm		
Queen Lane WTP		1.02 ppm	1.02 - 3.66 ppm		

TOTAL CHLORINE RESIDUAL - Tested throughout the Distribution System. Over 450 samples collected throughout the City every month.

Sample Location	Maximum Disinfectant Residual Level Allowed	Highest Monthly Average	Monthly Average Range	Violation	Source
Distribution System	4.0 ppm	2.08 ppm	1.52 - 2.08 ppm	No	Water additive used to control microbes

INORGANIC CHEMICALS (IOC) – PWD monitors for IOC more often than required by EPA.

Chemical	Highest Level Allowed (EPA's MCL)	Ideal Goal (EPA's MCLG)	Highest Result	Range of Test Results for the Year	Violation	Source
Barium	2 ppm	2 ppm	0.062 ppm	0.025 - 0.062 ppm	No	Discharges of drilling wastes; Discharge from metal refineries; Erosion of natural deposits
Chromium	100 ppb	100 ppb	1 ppb	0 - 1 ppb	No	Discharge from steel and pulp mills; Erosion of natural deposits
Cyanide Free	200 ppb	200 ppb	13 ppb	0 - 13 ppb	No	Discharge from steel/metal factories; Discharge from plastic and fertilizer factories
Fluoride	2 ppm*	2 ppm*	0.74ppm	0.70 - 0.74 ppm	No	Erosion of natural deposits; Water additive which promotes strong teeth; Discharge from fertilizer and aluminum factories
Nitrate	10 ppm	10 ppm	4.30 ppm	0.74 - 4.30 ppm	No	Runoff from fertilizer use; Leaching from septic tanks; Erosion of natural deposits

*EPA's MCL and MCLG is 4 ppm, but DEP has set this lower MCL and MCLG which takes precedence.

2015 DRINKING WATER QUALITY RESULTS

CRYPTOSPORIDIUM (Tested at Source Water to Water Treatment Plants Prior to Treatment)				
Treatment Technique Requirement	Baxter WTP One Year Range	Belmont WTP One Year Range	Queen Lane WTP One Year Range	Source
Total Number of Samples Collected	18	18	18	Naturally present in the environment
Number of Cryptosporidium Detected	5	5	9	
	0.028 count/L	0.033 count/L	0.050 count/L	

Cryptosporidium is a microbial pathogen found in surface water throughout the United States. Although filtration removes Cryptosporidium, the most commonly-used filtration methods cannot guarantee 100 percent removal. Our monitoring indicates the presence of these organisms in our source water. Current test methods do not allow us to determine if the organisms are dead or if they are capable of causing disease. For more information, please see the section on Cryptosporidium and Giardia on page 9.

TOTAL ORGANIC CARBON (TOC) -Tested at Water Treatment Plants					
Treatment Technique Requirement	Baxter WTP One Year Range	Belmont WTP One Year Range	Queen Lane WTP One Year Range	Violation	Source
Percent of Removal Required	35 - 45%	25 - 45%	25 - 45%	n/a	Naturally present in the environment
Percent of Removal Achieved	16 - 66%	14 - 56%	35 - 73%	No	
Number of Quarters out of Compliance	0	0	0		

PWD achieved TOC removal requirements in all quarters of 2015 at all WTPs. Compliance is based on a running annual average computed quarterly.

TURBIDITY - A MEASURE OF CLARITY - Tested at Water Treatment Plants					
	Baxter WTP	Belmont WTP	Queen Lane WTP	Violation	Source
Treatment Technique Requirement: 95% of samples must be at or below 0.300 NTU	100% below 0.300 NTU	100% below 0.300 NTU	100% below 0.300 NTU	n/a	Soil runoff, river sediment
Highest single value for the year	0.088 NTU	0.093 NTU	0.100 NTU	No	

We are required to monitor your drinking water for specific contaminants on a regular basis. Results of regular monitoring are an indicator of whether or not your drinking water meets health standards. PWD continuously operates and monitors water quality from a total of 160 filters at three drinking water treatment plants. In calendar year 2015, on one occasion, continuous on-line turbidity monitoring was interrupted on one of our filters and therefore we cannot be sure of the quality of the drinking water from this filter during the interruption. On 4/13/2015, Filter #34 at the Queen Lane Plant was found in service without turbidity monitoring for a period of 66 hours and 51 minutes. The monitoring interruption was caused by a closed sample tap valve that supplies filter water to the online turbidimeter. During this single filter monitoring interruption, the combination flow from the plant filters at Queen Lane Plant was continuously sampled and monitored with no change in turbidity levels. No water quality emergency occurred due to the monitoring interruption, and this notice is for informational purposes only.

RADIOLOGICAL CONTAMINANTS						
	EPA's MCL	EPA's MCLG	Highest Result	Yearly Range	Violation	Source
Alpha Emitters	15 pCi/L	0 pCi/L	0 pCi/L	0 - 0 pCi/L	No	Erosion of natural deposits
Beta Emitters	50 pCi/L*	0 pCi/L	17.5 pCi/L	0.84 - 17.5 pCi/L	No	Decay of natural and man-made deposits
Combined Radium 226 & 228	5 pCi/L	0 pCi/L	0 pCi/L	0 - 0.0 pCi/L	No	Erosion of natural deposits
Combined Uranium	30 µg/L	0 µg/L	0 µg/L	0 - 0 µg/L	No	Erosion of natural deposits

NOTE: The state allows us to monitor for some contaminants less than once per year because the concentration for these contaminants does not change frequently. Required monitoring was conducted in 2014 except for Beta Emitters which was conducted in 2011.

**The MCL for beta particles is 4 mrem/year. EPA considers 50 pCi/L to be the level of concern for beta particles.*

DISINFECTION BY-PRODUCTS					
	Highest Level Allowed (EPA's MCL) - One Year Average	Running Annual Average 2015*	System Wide Range of Results	Violation	Source
Total Trihalomethanes (TTHMs)	80 ppb	49 ppb	16 - 89 ppb	No	By-product of drinking water disinfection
Total Haloacetic Acids (THAAs)	60 ppb	44 ppb	16 - 96 ppb	No	By-product of drinking water disinfection

**Monitoring is conducted at 16 locations throughout the City of Philadelphia. This result is the highest locational running annual average in 2015.*



SCHUYLKILL AND DELAWARE RIVER SOURCE WATER PROTECTION PLANS



The Schuylkill and Delaware River Source Water Protection Plans provide a comprehensive framework for implementing a watershed-wide effort to improve source water quality and quantity. The plans prioritize and outline several approaches to reduce sources of contamination to Philadelphia's raw water supply. PWD has made exceptional progress accomplishing these goals. We've established the Schuylkill Action Network, a regional partnership in the Schuylkill River Watershed, and have prioritized land for permanent protection. PWD also advocates for policies to protect and preserve our source waters and forested lands and collaborates with the Commonwealth of Pennsylvania to ensure regulations are enforced for wastewater treatment plants and industries that discharge upstream of Philadelphia.

Progress has been made addressing potential threats to our water supply within Philadelphia's own boundaries. Educational campaigns promoting proper disposal of unused pharmaceuticals and outreach efforts to mark storm drains in the City that drain directly to surface waters demonstrate the relationship between river water quality and drinking water quality. Projects like improved stream buffers in Fairmount Park and goose deterrent programs at local schools and parks reduce the amount of water quality contaminants entering our local waterways.

The Source Water Protection Program conducts research to improve Philadelphia Water's knowledge of potential concerns to Philadelphia's water supplies. This research further

defines our watershed protection priorities. Recent and on-going studies include analyzing flows needed to protect PWD's drinking water intakes on both the Schuylkill and the Delaware Rivers, evaluating upstream development policies and activities to ensure continued protection of our drinking water supply, tracking of major sources of human infectious pathogens such as *Cryptosporidium* and following water quality trends and climate change predictions.

In 2015, PWD completed its third year of implementation of a 5-year Watershed Control Plan to reduce *Cryptosporidium* in the Schuylkill River watershed. The Watershed Control Plan helps ensure PWD's compliance with the EPA's Long-Term 2 Enhanced Surface Water Treatment Rule at the Queen Lane Drinking Water Treatment Plant.

PWD has also made significant progress toward upgrading, expanding and improving upon the Delaware Valley Early Warning System (EWS), a mass communication network used to notify water suppliers and industrial users throughout the watershed of any spills or other water quality concerns via email and telephone. PWD continues to further enhance this system with advanced technological upgrades and improvements like a tidal spill modeling component that was a recipient of a 2015 Governor's Award for Environmental Excellence. PWD continues to work closely with the City's Office of Emergency Management and state and federal agencies to ensure that we are ready and able to respond to any water-related emergency event.

If you would like to receive a copy of the source water assessment summaries, or would like to know how to get involved in protecting your water supply or watershed, please call Philadelphia Water at 215-685-6300, see Table 2 on page 23 of this report, or go to www.phillywatersheds.org/what_were_doing/documents_and_data/watershed_plans_reports.

CELEBRATING 200 YEARS OF INGENUITY, INNOVATION & BEAUTY IN 2015

For the Fairmount Water Works (FWW), 2015 was a year of celebration, reflection and excitement about the future. For 200 years, the Fairmount Water Works has been a leading symbol of technological innovation, a cultural destination and a leader in urban environmental education. Since opening its doors in 2003 as the public education classroom of Philadelphia Water, FWW has educated more than 500,000 visitors on how to be better stewards of our water resources, becoming the destination for innovative water and watershed education programming in the region.

The Fairmount Water Works provides family-friendly activities, on- and off-site guided public tours, and hands-on lessons for pre-K through college-age students. We have established partnerships with various environmental, educational, civic and cultural organizations in an effort to celebrate its bicentennial in truly unique ways.

Art on the Circuit: The Fairmount Water Works was awarded an \$82,500 planning grant from the William Penn Foundation to support an interactive public art engagement installation along the popular Schuylkill River Trail. Artist Alison Stigora is developing a prototype of the sculpture titled "Hydraulica". The piece will connect outdoor enthusiasts with information about urban watersheds and promote sharing of the information through online platforms. It will also help expand awareness of the river, our watershed, water quality, and our organization. Art on the Circuit truly integrates science and art to lasting effect.

Freshwater Mussel Demonstration Hatchery:

Funded in part by a \$300,000 grant from the Pew Center for Arts & Heritage, this project will demonstrate the ecological benefits of freshwater mussel restoration within a holistic watershed and provide an interpretive installation at an iconic Philadelphia cultural institution. The project will bring together designers, environmentalists, government agencies, academic partners, communities and bivalve experts to create a site-specific 530 square foot "living enclave." It will also provide an opportunity for students in Philadelphia, and visitors to the Circuit, to participate and engage in a living laboratory, and develop an appreciation for, and connection to the river. The exhibit will provide a critical public platform for education, interpretation, art, science and community outreach to build awareness and support for this sustainable approach to the health of our region's watersheds. In addition to the Mussel Hatchery on the site, FWW will develop a Mobile Mussel Nursery that will be taken to schools and placed in a central location at FWW to draw visitors to see the Hatchery.

Culture & Conversation: The Fairmount Water Works' Culture & Conversation series uses art to ignite meaningful conversation around important environmental issues. Each public installation kicks off with a public reception highlighting interpretive artwork. This year, the Fairmount Water Works highlighted the work of local artists Pamela Tudor ("Lost Ice" – climate change), Bradley Maule ("One Man's Trash" – litter), and Nancy Agati ("Churn Ripple Flow" – flow formations on the water's surface along the Schuylkill Banks). The series drew more than 200 visitors.



Turbine: Hundreds gathered on the grounds of the Fairmount Water Works to see the immersive work of the Mendelssohn Club, Leah Stein Dance Company, and composer Byron Au Yong. The two performances included singers, dancers, and instruments. They featured choreography and music shaped in response to the site's architecture and landscape. Audience members were truly submerged into the experience, as they moved along the grounds with the performers and became viewers and participants.

Middle-years Teacher Fellowship Program:

A \$500,000 grant from the William Penn Foundation enabled the Fairmount Water Works to launch a three-year program to develop a new curriculum. This curriculum will integrate urban watershed education with core science and English standards for public school students in grades 6-8. The FWW's Understanding the Urban Watershed Curriculum Guide serves as the framework for this program, which will reach more than 1,500 students in the first three years.

Visit Us: People of all ages are invited to join us in discovering the wonders of water in our world. Visit www.fairmountwaterworks.org or call 215-685-0723 for the latest program listings, tours, and events. We also invite you to connect with us on Facebook, Twitter, and Instagram (@FairmountWW).

FIVE YEARS OF CLEANER WATER THROUGH A GREENER CITY



Philadelphia's program to protect our waterways through infrastructure investments and green tools that make neighborhoods more vibrant is about to get much bigger.

June 2016 marks the five-year anniversary of Philadelphia's groundbreaking agreement with regulators to take on stormwater and combined sewer overflows—the biggest sources of pollution impacting our rivers today—using a program built around substantial green infrastructure investments.

Called *Green City, Clean Waters*, this 25-year City of Philadelphia program **is the first green-centric plan in the U.S.** to gain acceptance from the Environmental Protection Agency, the federal regulator responsible for protecting the nation's drinking water sources.

With the help of residents, City departments, private developers, elected officials and environmental advocates, **Philadelphia Water has led the way in transitioning *Green City, Clean Waters* from its pilot phase to a real-life program** that is making our rivers cleaner right now while improving our neighborhoods, block by block.

This summer, we will celebrate how far we have come and thank the people who are making *Green City, Clean Waters* a success. **Visit www.Phila.gov/water/Sustainability to take part.**

How Does *Green City, Clean Waters* Work?

Green City, Clean Waters is a major investment in Philadelphia's infrastructure that involves **important upgrades to our Water Pollution Control Plants** and building new systems and storage tanks that help us treat stormwater.

However, what makes this program revolutionary is its "green first" approach to solving stormwater challenges. We are the first city in America to create a program that relies on **specially designed green systems made of plants, soil and stone to control the stormwater pollution impacting our rivers.**

Without those green systems, that stormwater can carry pollution into our rivers and creeks and overwhelm the City's combined sewer system, causing diluted sewage to spill into waterways.



The First Five: What We Accomplished

In the first five years of *Green City, Clean Waters*, we added 1,000+ green stormwater tools to our neighborhoods, **keeping hundreds of millions of gallons of polluted water out of our rivers** annually.

And, while everyone loves nice round numbers, **the *Green City, Clean Waters* five-year anniversary is much more than that.** To ensure that we're moving toward a future with cleaner rivers, the EPA and Philadelphia agreed to specific goals to be achieved by 2036.

Within the first five years, Philadelphia had to show (among other things) that we could build **744 "Greened Acres"**—a term used to describe the volume of stormwater managed with green tools.

We did more than meet that five-year target. By June 2016, we will have **over 750 greened acres**, a feat that means **we are now keeping over 600 million gallons of polluted water out of our rivers** each year.

Goal: Next 5 Years

We will hold events this summer and fall to mark *Green City, Clean Waters* accomplishments, but we're also gearing up for the next five-year target. Philadelphia Water must achieve **2,148 Greened Acres** by 2021—**nearly three times what the City has accomplished so far, and enough to keep 2 billion gallons of polluted water out of our rivers annually.**

As we continue to grow this revolutionary program for protecting and improving Philadelphia's most important natural resources—the Delaware and Schuylkill Rivers, **which provide all of our drinking water**—we'll be working with you, our customers.

We hope you will join us as we take *Green City, Clean Waters* to the next level and build a future with cleaner, healthier rivers and greener, more beautiful neighborhoods.

Visit [www.Phila.gov/water](http://www.phila.gov/water) to sign up for the Philadelphia Water e-newsletter and get important updates on Green City, Clean Waters and other programs and projects.



CLEAN WATER BEGINS AND ENDS WITH YOU

DON'T POLLUTE!

Always recycle or dispose of household hazardous wastes properly. Don't pour motor oil, antifreeze or other toxic materials down storm drains.

Water that enters our storm drains often flows directly to our local streams and rivers. Recycle these household hazardous materials safely and help protect our waterways. Don't flush paint thinners, insect sprays, herbicides and other harmful chemicals down the toilet or put them down the sink. Contact the Streets Department to get a schedule of their Household Hazardous Materials Drop-off Events where you can dispose of these materials safely without polluting your drinking water supply.

We welcome your ideas and opinions

We participate in nearly 200 public and community events a year, including presentations made at schools, on-going educational programs and other environmental celebrations. We offer ways for individuals, families, students, seniors, community groups and others to participate in learning about protecting water.

Get Involved

If you would like to help protect your water supply or watershed, please call Philadelphia Water at 215-685-6300, visit our website at www.phila.gov/water, or see Table 2 on page 23.

Contact us

Philadelphia Water
Aramark Tower
1101 Market Street, 3rd Floor
Philadelphia, PA 19107-2994

Customer Information Hotline:
215-685-6300

Important Telephone Numbers & Websites

Delaware River & Schuylkill River Source Water Assessments

www.phillywatersheds.org/what_were_doing/documents_and_data/watershed_plans_reports

Fairmount Water Works

215-685-0723
www.fairmountwaterworks.org

Philadelphia River and Watershed Information

www.phillywatersheds.org

Philadelphia Streets Department

215-686-5560
www.philadelphiastreet.com

Philadelphia Water

215-685-6300
www.phila.gov/water

RiverCast

www.phillyrivercast.org

Schuylkill Action Network

800-445-4935
www.schuylkillwaters.org

U. S. Environmental Protection Agency

Safe Drinking Water Hotline

800-426-4791
www.water.epa.gov

Water Revenue Bureau

215-686-6880
www.phila.gov/revenue

TABLE 1: WHO TO CALL TO REPORT VARIOUS SITUATIONS

Situation	Who To Call	Phone
Dead Fish	Fish & Boat Commission PADEP	717-626-0228 484-250-5900
Illegal Dumping & Related Pollution Activities	PADEP	484-250-5900
Sewage Spills	PADEP PWD	484-250-5900 215-685-6300
Oil & Gas Spills / Accidents	PADEP PWD	484-250-5900 215-685-6300

TABLE 2: PLACES TO GO TO GET INVOLVED IN PROTECTING YOUR LOCAL STREAMS, RIVERS AND WATER SUPPLY

Organization	Activity Types	Phone	Website
Environmental Alliance for Senior Involvement	A, C, E, P, T	203-779-0024	www.easi.org
Friends of Fox Chase Farms	A, C, E, P	215-728-7900	www.foxchasefarm.org
Friends of the Manayunk Canal	A, C, E, P, T	N/A	www.manayunkcanal.org
Friends of Pennypack Park	A, C, E, P, T	215-934-PARK	www.friendsofpennypackpark.org
Friends of the Wissahickon	A, C, E, P, T	215-247-0417	www.fow.org
Lower Merion Conservancy	A, C, E, P, T	610-645-9030	www.lmconservancy.org
Partnership for the Delaware Estuary	A, B, C, E, P, S,T	1-800-445-4935	www.delawareestuary.org
Philadelphia Anglers Club	A, C, E, F	N/A	www.philadelphiaanglersclub.com
Philadelphia Canoe Club	F, R	215-487-9674	www.philacanoe.org
Schuylkill Action Network	A, B, C, E, L, P, T	800-445-4935 x109	www.schuylkillwaters.org
Schuylkill Banks	B, E, L	N/A	www.schuylkillbanks.org
Schuylkill Center for Environmental Education	A, B, C, E, P, T	215-482-7300	www.schuylkillcenter.org
Senior Environment Corps	A, C, E, P, T	215-848-7722	www.centerinthepark.org
Tookany/Tacony-Frankford (TTF) Watershed Partnership	A, C, E, P, T	215-744-1853	www.ttfwatershed.org
U.S. Water Alliance	A, B, E	202-533-1810	www.uswateralliance.org
Wissahickon Restoration Volunteers	A, C, E, P, T	215-798-0044	www.wissahickonrestorationvolunteers.org
Wissahickon Valley Watershed Association	A, C, E, P, T	215-646-8866	www.wvwa.org



ACTIVITY TYPES

- A:** Environmental activism
- B:** Business-related protection and educational activities
- C:** Clean-up of trash and litter
- E:** Environmental education
- F:** Fishing or fish recreation activities
- L:** Land conservation and management
- P:** Planting trees and streambank repair/ protection
- R:** Rowing, canoeing and related boating activities
- S:** Storm drain marking
- T:** Water quality testing

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