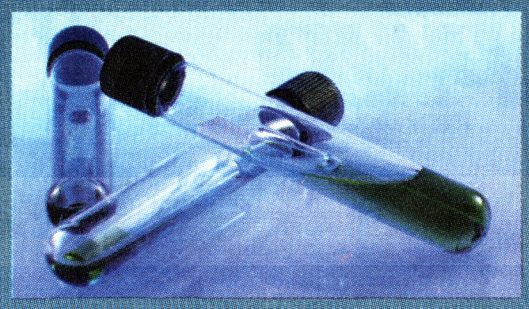
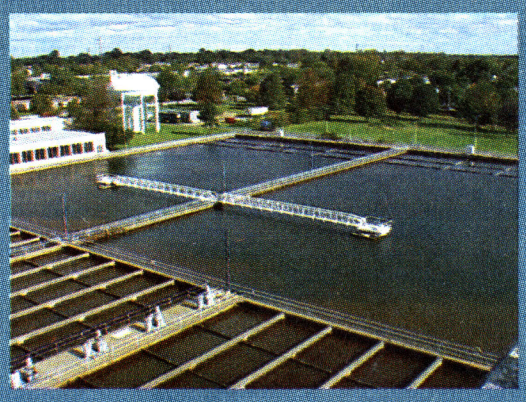
Philadelphia Water Department

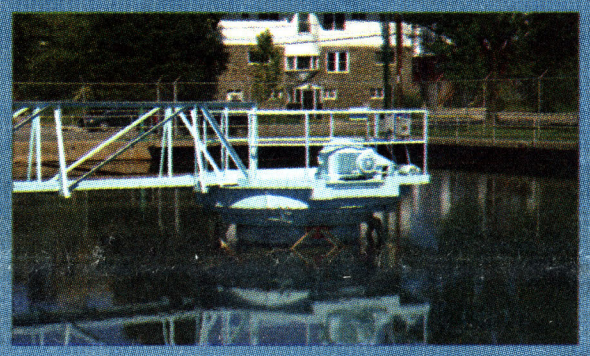
[2006]

annual

Drinking Water Quality Report







This report is being mailed to 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.

Philadelphia's water is safe and healthy to drink for most people.
For people with special health concerns, please see the information on page two.

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- Association of Metropolitan Water Agencies
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- Water Environment Federation
- Water Environment Research Foundation

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WATER DEPARTMENT CUSTOMER
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PWD's Public Water System Identification #PA1510001

This report is available online at http://www.phila.gov/water

The Philadelphia Water Department

The Philadelphia Water Department (PWD) is pleased to present our annual Water Quality Report. This report, published in April 2007, includes water quality information for the 2006 calendar year.

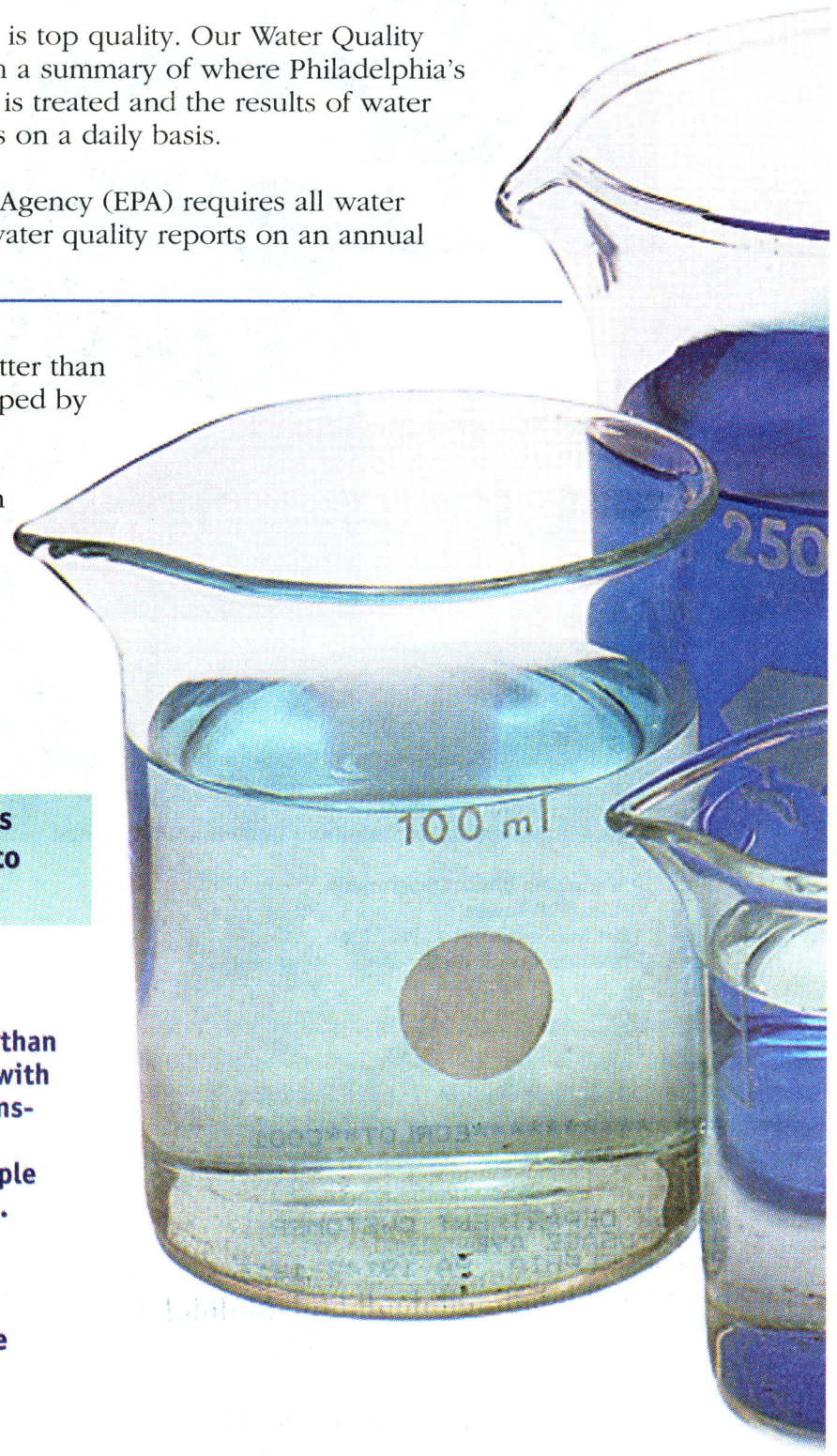
The good news is – your tap water is top quality. Our Water Quality Report provides our customers with a summary of where Philadelphia's drinking water comes from, how it is treated and the results of water quality monitoring performed by us on a daily basis.

The U.S. Environmental Protection Agency (EPA) requires all water utilities to produce and distribute water quality reports on an annual basis.

Our standards are the highest: our drinking water consistently performs better than all drinking water standards developed by the EPA to protect public health.

We have consistently performed better than all drinking water standards developed by the EPA to protect public health.

How do we do this? We use proven treatment practices at our water treatment plants and we participate in groundbreaking research while keeping water rates among the lowest in the region.



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.

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.

Environmental Protection Agency/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.

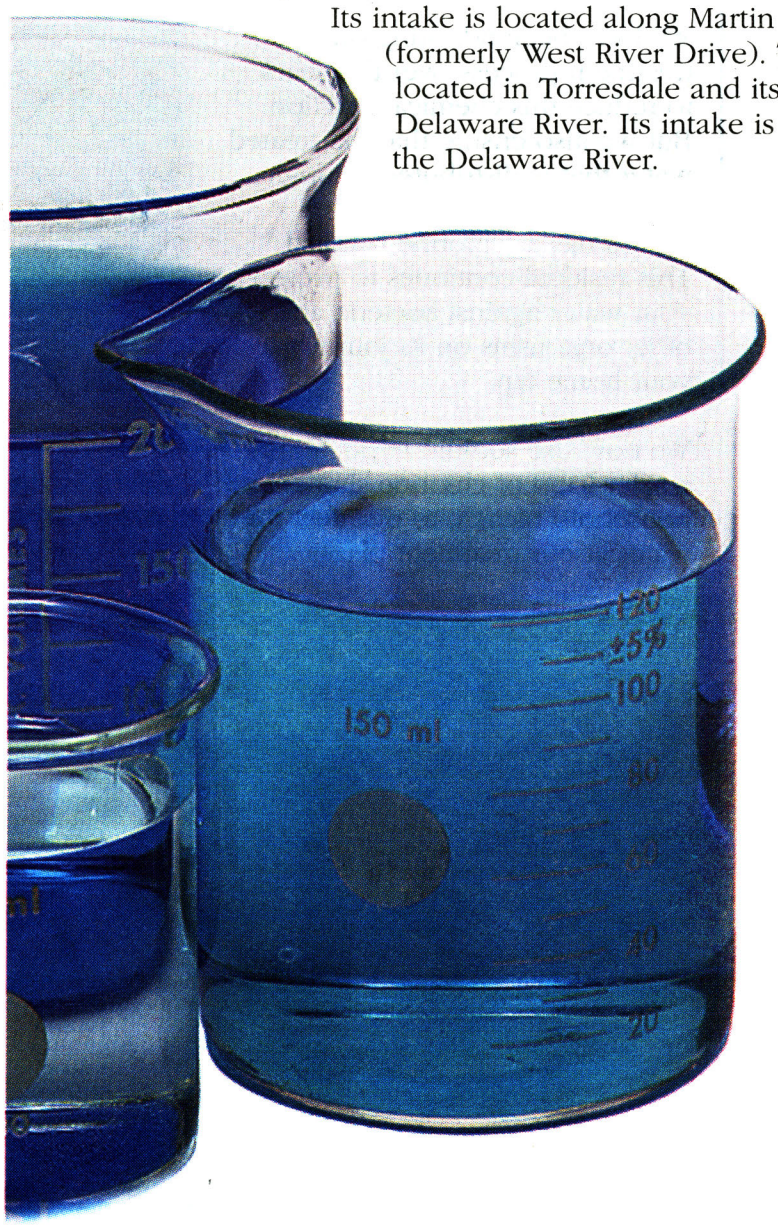
Where does Philadelphia's drinking water come from?

Philadelphia 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.

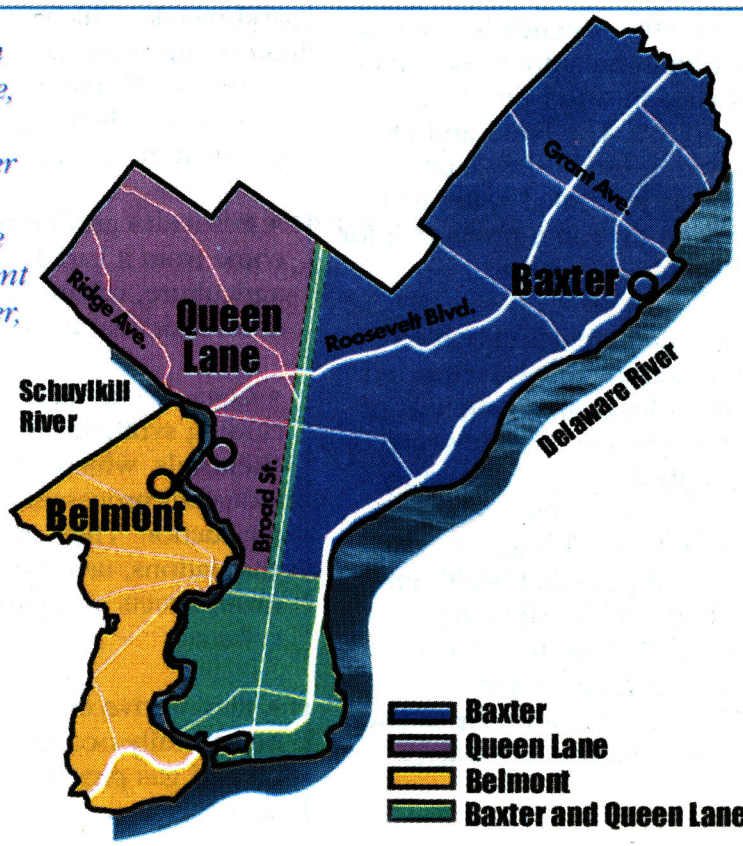
Map Courtesy of the Delaware River Basin Commission, Delaware River Basin Commission Map Collection.

The water that we treat comes from the Schuylkill and Delaware rivers. Rivers are surface water supplies. Philadelphia does not use groundwater. Each river contributes approximately one-half of the City's overall supply. We produce approximately 256 million gallons of high-quality drinking water for our customers on a daily basis.

PWD has three water treatment plants that process untreated river water. 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 (formerly West River 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.



Depending on where you live, you receive drinking water from one of the city's three water treatment plants – Baxter, Belmont, or Queen Lane.



Safeguarding the water you drink.

At their sources, the Delaware and Schuylkill Rivers are generally clean rivers. 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, the City 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 Environmental Protection Agency 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 Environmental Protection Agency's Safe Drinking Water Hotline (800-426-4791) or from their website (http://www.epa.gov/safewater).

How do drinking water sources become polluted?

Across the nation, sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs and wells. As water (such as rain and melting snow) travels over the surface of the land or through the ground, it dissolves naturally occurring minerals and, in some cases, radioactive material, and can pick up substances resulting from the presence of animals or from human activity.

Contaminants that may be present in source water include:

- Microbial contaminants, such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations and wildlife.

- Inorganic contaminants, such as salts and metals, which can be naturally occurring or result from urban storm water runoff, industrial or domestic wastewater discharges, oil and gas production, mining or farming.

- Pesticides and herbicides, which may come from a variety of sources such as agriculture, urban storm water runoff and residential uses.

- Organic chemical contaminants, including synthetic and volatile organic chemicals, which are byproducts of industrial processes and petroleum production. They can also come from gas stations, urban storm water runoff (from streets and parking lots) and septic systems.

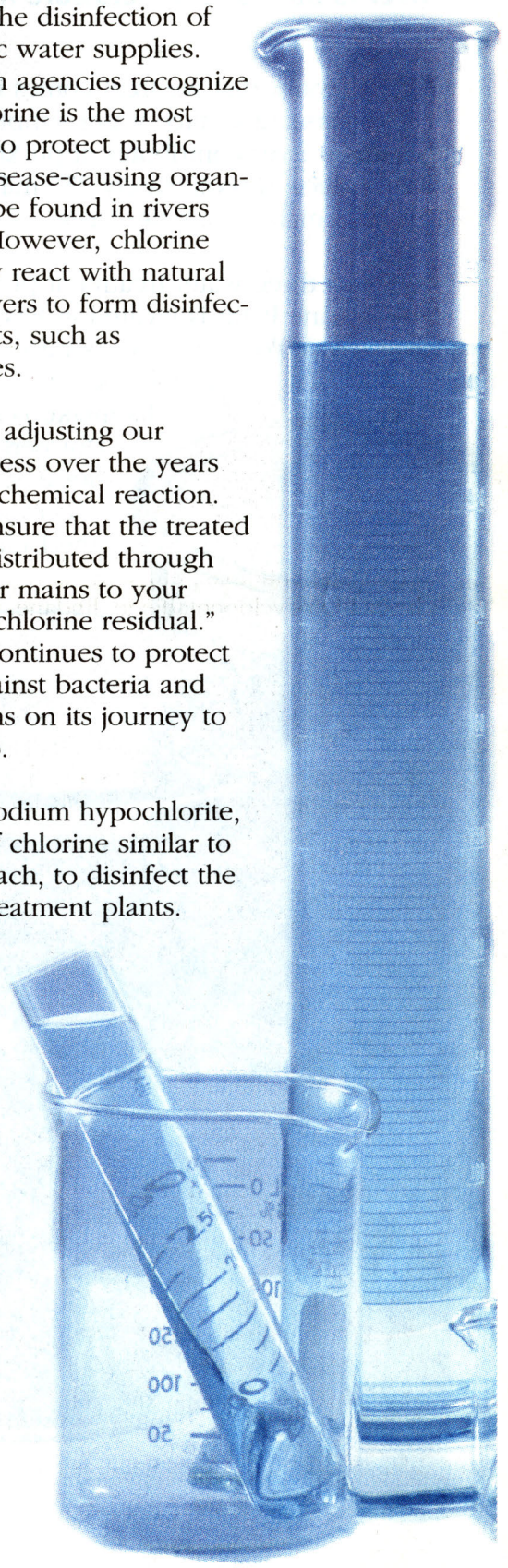
- Radioactive contaminants, which can be naturally occurring or be the result of oil and gas production and mining activities.

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 byproducts, such as trihalomethanes.

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 your homes has a "chlorine residual." This residual continues to protect your water against bacteria and other organisms on its journey to your home tap.

We now use sodium hypochlorite, a safer form of chlorine similar to household bleach, to disinfect the water at our treatment plants.



What do we look for?

In addition to the contaminants that appear in our charts, we look for over 100 other contaminants that were not found at reportable levels.

Inorganic Chemicals:

Antimony, arsenic, barium, beryllium, cadmium, chromium, cyanide free, fluoride, mercury, nitrate, selenium, thallium

Synthetic Organic Chemicals:

Alachlor, atrazine, benzo(a)pyrene, carbofuran, chlordane, dibromochloropropane, di(2-ethylhexyl) adipate, di(2 ethylhexyl) phthalate, endothall, ethylene dibromide, hexachlorocyclopentadiene, lindane, methoxychlor, oxamyl, pentachlorophenol, picloram, simazine

Volatile Organic Chemicals:

Benzene, carbon tetrachloride, o-dichlorobenzene, p-dichlorobenzene, 1,2-dichloroethane, 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, total xylenes

Appealing to Your Senses

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

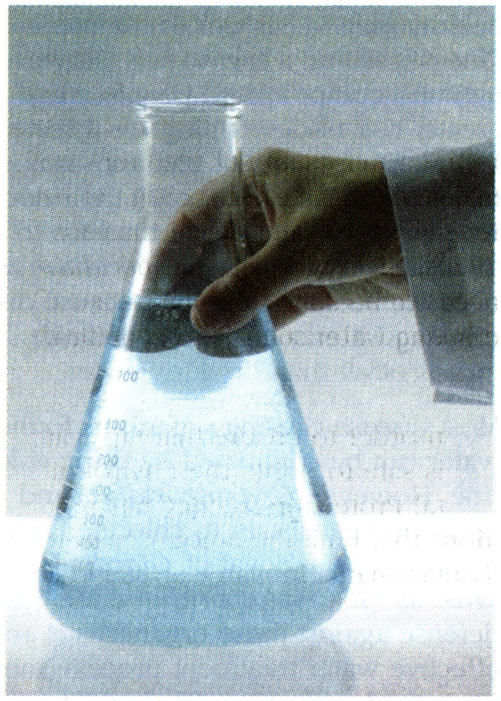
Additional Testing

We periodically test for the following contaminants, even though the Pennsylvania Department of Environmental Protection (PADEP) does not require us to do so: nitrite, asbestos, dalapon, dinoseb, dioxin, diquat, endrin, glyphosate, hexachlorobenzene, 2,4-D, PCBs, toxaphene, 2,4,5-TP, heptachlor, heptachlor epoxide, and vinyl chloride. No significant levels of any of the above contaminants have been found in Philadelphia's drinking water.

Lead in drinking water

It is important to minimize the intake of lead from dust inhalation, food, and water. Children are particularly susceptible to the health effects of lead poisoning. Lead is most commonly found in dust, paint and contaminated soil. To a lesser extent, lead can also occur in tap water. Components of plumbing may have lead in them. You may be surprised to learn that brass fixtures, valves and faucets contain lead. Many homes still have leaded solder that was once used to join copper pipe together. Some homes in Philadelphia still have lead service lines and, when disturbed, these lines can contribute to lead in tap water. It is the homeowner's responsibility to maintain, repair and replace the service lines.

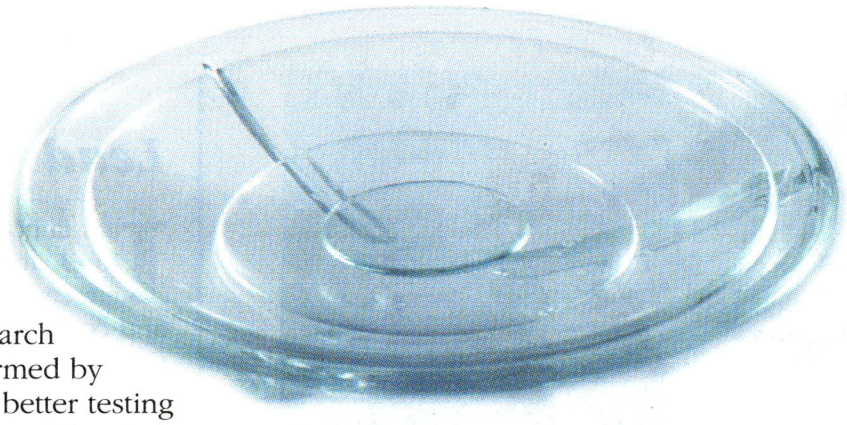
Our primary role in helping you minimize your intake of lead is to reduce the corrosive effects of tap water on materials that contain lead. Water is corrosive and encourages the dissolving of lead from these materials. The Philadelphia Water Department has a permit with PADEP for operating under optimized corrosion control. Under this permit we maintain the pH of water between 6.8 and 7.8. We also maintain the amount of the corrosion inhibitor, zinc orthophosphate, at greater than 0.12 mg/L (0.12 ppm) as phosphorus. These conditions minimize lead leaching from plumbing materials.



Currently, every three years the Philadelphia Water Department tests for tap water lead at more than 50 representative taps of vulnerable homes in the city. We do this according to the requirement of the EPA's Lead and Copper Rule. The testing results are used to determine if our corrosion control treatment technique is working, so that water has minimum potential for lead to leach from plumbing materials. So far, our test results show that our treatment techniques keep lead levels to a minimum.

However, this could change in any year because Philadelphia is required to meet other regulations for tap water quality. Sometimes these water quality changes can affect the corrosion potential of the water. If such a change were to occur, the Philadelphia Water Department would notify its customers of the change while it works to return to minimum corrosion conditions again. Water utilities all over the country are in the same position as Philadelphia, trying to balance all of the regulatory requirements and changes at one time so that their customers receive the best quality water possible. We are committed to reducing the corrosive effects of plumbing and lead levels in water. Additional information is available from the Environmental Protection Agency's Safe Drinking Water Hotline at 800-426-4791.

Research and Monitoring for Cryptosporidium and Giardia



Cryptosporidium and *Giardia* are microscopic organisms found in surface water throughout the U.S. They are found in animal wastes and sewage. They can be washed into rivers and streams when it rains. When ingested, they can result in diarrhea, fever, nausea and abdominal cramps. However, these are also symptoms of many intestinal diseases caused by bacteria, viruses or parasites.

Cryptosporidium and *Giardia* cannot be diagnosed by symptoms alone. Most healthy individuals can overcome such illnesses within a few weeks. However, immuno-compromised people are at greater risk of developing life-threatening illness. We encourage immuno-compromised individuals to consult their doctor regarding appropriate precautions to take to avoid infection. *Cryptosporidium* and *Giardia* must be ingested to cause disease, and it may be spread through means other than drinking water.

Most disease-causing organisms found in water can be eliminated by using chlorine. However, *Cryptosporidium* and *Giardia* are resistant to chlorine. Treatment for the removal of *Giardia* is the same as for *Cryptosporidium*. The best defense against these organisms is an effective water treatment process; most importantly, filtration. We look at turbidity to determine how well our filters are performing. Turbidity has no health effect. However, turbidity can interfere with disinfection and provide a medium for microbial growth. It may indicate the presence of disease-causing organisms. That's why it's important to us to ensure that our filters are working at their best.

Tiny particles – particles the same size as *Cryptosporidium* and *Giardia* and smaller than particles visible to the human eye – are being successfully removed from our water. The Philadelphia Water Department 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. Continual research is being performed by us to discover better testing methods, to determine the sources of these pathogens in our rivers, and to ensure that our treatment practices to protect our drinking water are working.

Testing Treated Water

In 2006, we conducted 36 tests on our treated drinking water. One empty *Giardia* cyst was detected in the treated water. None of the samples were positive for *Cryptosporidium*.

Testing Untreated River Water

Seventy-five (75) percent of the samples of untreated water taken from the rivers were positive for *Giardia* and fifty-three (53) percent were positive for *Cryptosporidium*. These tests were conducted in 2006 on river water samples drawn at our plants' intakes before the water was treated. Intakes are the locations where we pump the river water to our settling reservoirs.

We are also working closely with the Philadelphia Department of Public Health to ensure that our tap water is free of pathogens that can be found in rivers. In addition to routinely monitoring *Cryptosporidium* at our drinking water intakes, we are involved in an innovative project with Lehigh University to identify the sources of *Cryptosporidium* in our watersheds. As part of the project, we collect water samples upstream of our drinking water intakes. We isolate the *Cryptosporidium* oocysts, and conduct DNA analyses to determine whether the oocysts originate from human sources or from other species such as dogs, cats, deer, geese, cows, horses, etc. By identifying the sources of *Cryptosporidium* in the watershed, we are taking a proactive approach in improving the river water quality.

Partnership for Safe Water

Employees of the Philadelphia Water Department's three water treatment plants have earned six consecutive Director's Awards for maintaining an elite status in the Partnership for Safe Water. This award is presented to utilities across the country which meet or go beyond the water quality goals established by the Partnership for Safe Water.

Dating back to 1996, the Philadelphia Water Department was one of the first utilities to join this unique partnership between the drinking water industry and the EPA to make voluntary improvements in the nation's drinking water quality. This program was designed to be much more rigorous than the requirements of State and federal laws.

The turbidity of Philadelphia's water is 80 percent less than the maximum amount allowed by State and federal regulations, and it is 40 percent less than the Partnership's voluntary goal of 0.1 ntu.

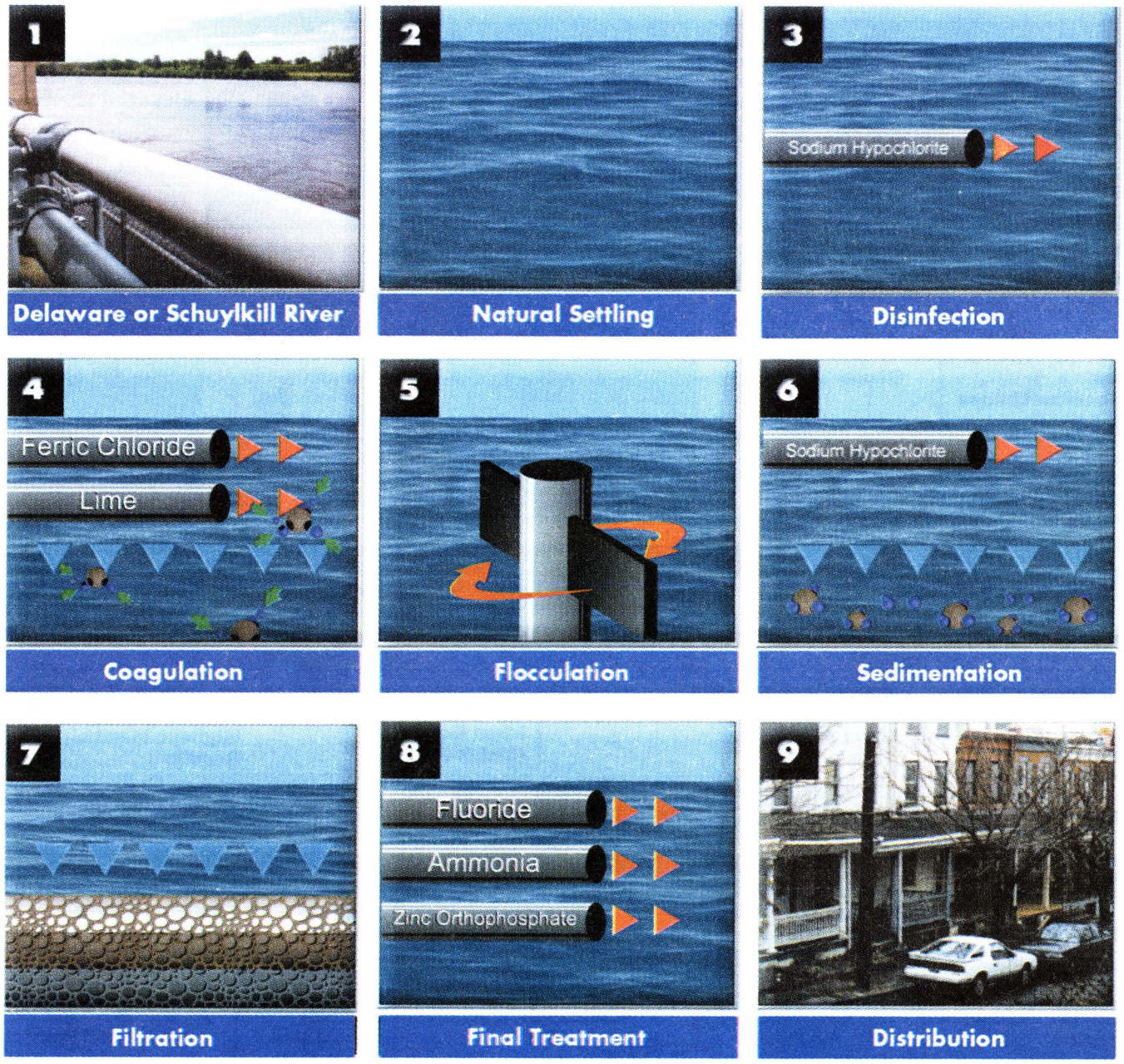
The Partnership for Safe Water established a turbidity goal of less than 0.10 ntu (at all times tested). Today, all three of our water treatment plants continue to lower their ntu levels, achieving a total annual average of 0.06 ntu.

Through our participation in this program, we have surveyed our treatment plants, treatment processes, operating and maintenance procedures, and management oversight practices to learn how we can improve our water system. We have already made many of the improvements, and we will continue to apply others. These improvements have helped to enhance our water system's ability to prevent *Cryptosporidium*, *Giardia*, and other microbial contaminants from entering the water we treat.

drinking water treatment

How Do We Treat the Water So That You May Drink It?

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.



1. The River
The source water comes from either the Delaware or Schuylkill River.

2. Natural Settling
Water is stored in reservoirs or basins after it has been pumped from the river to allow sediments to settle.

3. Disinfection
Sodium hypochlorite is added to kill disease-causing organisms.

4. Coagulation
The river water is "coagulated." Chemicals are added to the water to cause smaller particles in water to join together. This makes them heavier so that they will settle to the bottom of the basin.

5. Flocculation
The water is mixed to make sure the added chemicals are well blended and react with all of the smaller particles. The particles combine to form "floc" which settle to the bottom of the basin.

6. Sedimentation
The newly joined particles or "floc" settle by gravity and are removed from the bottom of the mixing tanks.

7. Filtration
The water is pushed through filters, which remove finer particles still in the water for additional purification.

8. Final Treatment
Fluoride is added to help prevent tooth decay. Zinc orthophosphate is added to minimize corrosion activity between water and piping materials. Ammonia is added to reduce chlorine-like tastes and to help the sodium hypochlorite to persist in the water while it travels through the water main system.

9. Distribution
The treated water is distributed through nearly 3,300 miles of water mains.

2006 DRINKING WATER QUALITY

METALS – *Tested at Customers' Taps - Testing is done every 3 years. Most recent tests were done in 2005.*

	EPA's Action Level for representative sampling of customer homes	Ideal Goal (EPA's MCLG)	90% of PWD customers' homes were less than	No. of homes considered to have elevated levels	Source
Lead	90% of homes must test less than 15 ppb	0	9 ppb	9 out of 107	Corrosion of household plumbing
Copper	90% of homes must test less than 1.3 ppm	1.3 ppm	0.3 ppm	0	Corrosion of household plumbing

DISINFECTION BYPRODUCTS IN TAP WATER

	Highest Level Allowed (EPA MCL) One Year Average	Baxter WTP One Year Average	Belmont WTP One Year Average	Queen Lane WTP One Year Average	Source
Total Trihalomethanes (TTHMs)	80 ppb	48 ppb Range of individual test results: 16 - 98 ppb	46 ppb Range of individual test results: 12 - 88 ppb	44 ppb Range of individual test results: 17 - 75 ppb	Byproduct of drinking water chlorination
Total Haloacetic Acids (THAAs)	60 ppb	43 ppb Range of individual test results: 24 - 77 ppb	32 ppb Range of individual test results: 15 - 57 ppb	29 ppb Range of individual test results: 16 - 49 ppb	Byproduct of drinking water chlorination

TOTAL ORGANIC CARBON (Ratio of Removal Achieved Divided by Removal Required)

Treatment Technique One Year Average	Baxter WTP One Year Average	Belmont WTP One Year Average	Queen Lane WTP One Year Average	Source
Must be greater than or equal to 1	1.41	1.59	1.71	Naturally present in the environment.

BACTERIA IN TAP WATER *NOTE: Seven of the samples with Total Coliforms tested positive for E. coli.*

	Level Allowed (EPA's MCL)	Ideal Goal (EPA's MCLG)	Highest Monthly Results	Source
Total Coliform Bacteria	Presence of coliform bacteria in 5% or less of more than 360 monthly samples	0	Highest % of positive samples: 0.60%	Naturally present in the environment.

OTHER CHEMICALS IN TAP WATER – PWD monitors annually although we are only required to report every nine years

	Highest Level Allowed (EPA's MCL)	Ideal Goal (EPA's MCLG)	Highest Result	Range of Test Results for the Year	Source
Nitrate	10 ppm	10 ppm	3.9 ppm	0.7 - 3.9 ppm	Fertilizer runoff, sewage
Barium	2 ppm	2 ppm	0.04 ppm	0.03 - 0.04 ppm	Metal refineries or natural deposits
Cyanide	0.2 ppm	0.2 ppm	0.11 ppm	0.034 - 0.11 ppm	Discharge from steel/metals, plastics and fertilizer factories

CLARITY CHARACTERISTICS – Tested at Water Treatment Plants

Turbidity (measure of clarity)		Baxter WTP	Belmont WTP	Queen Lane WTP	Source
Treatment Technique Requirement		95% of samples must be at or below 0.30 ntu	95% of samples must be at or below 0.30 ntu	95% of samples must be at or below 0.30 ntu	Soil runoff, river sediment
Highest Single Value for the year		0.09 ntu	0.09 ntu	0.10 ntu	Soil runoff, river sediment
NOTE: PWD achieved turbidity limits 100% at all times tested.					
		Baxter WTP	**Belmont WTP**	**Queen Lane WTP**	
Hardness (as Calcium Carbonate)	Annual Average *parts per million or grains per gallon*	83 ppm or 5 grains	136 ppm or 8 grains	159 ppm or 9 grains	
	Annual Minimum *parts per million or grains per gallon*	62 ppm or 4 grains	98 ppm or 6 grains	105 ppm or 6 grains	
	Annual Maximum *parts per million or grains per gallon*	105 ppm or 6 grains	184 ppm or 11 grains	208 ppm or 12 grains	
Alkalinity (as Calcium Carbonate)	Annual Average	37 ppm	63 ppm	65 ppm	
	Annual Minimum	22 ppm	44 ppm	48 ppm	
	Annual Maximum	50 ppm	90 ppm	84 ppm	

SODIUM IN TAP WATER

Chemical	Baxter WTP One Year Average	Belmont WTP One Year Average	Queen Lane WTP One Year Average
Sodium	17 ppm or 4 mg per 8 oz. glass of water Range of individual test results: 13 - 22 ppm or 3 - 5 mg per 8 oz. glass of water	30 ppm or 7 mg per 8 oz. glass of water Range of individual test results: 18 - 45 ppm or 4 - 11 mg per 8 oz. glass of water	30 ppm or 7 mg per 8 oz. glass of water Range of individual test results: 22 - 46 ppm or 5 - 11 mg per 8 oz. glass of water

NOTE: We conducted monitoring for sodium throughout the year, although federal regulations do not require it.

TOTAL CHLORINE RESIDUAL – over 400 samples collected throughout the city every month

Total Chlorine in Tap Water	EPA Maximum Residual Disinfectant Level	One Year Average	Range of Highest Levels Detected at Taps
Chloramine	4.0 ppm	1.58 ppm	1.4 - 2.9 ppm

RADIOACTIVE CONTAMINANTS

Radioactive Contaminants	Highest Level Allowed (EPA's MCL)	Ideal Goal (EPA's MCLG)	Highest Result	Range of Test Results for the Year	Source
Alpha	15 pCi/L	none	3.7 pCi/L	0 - 3.7	Erosion of natural deposits of certain radioactive minerals.
Combined Radium 226 & 228	5 pCi/L	none	3.2 pCi/L	0 - 3.2	Erosion of natural deposits of certain radioactive minerals.

During the period of 2005, we conducted initial monitoring for a revised radionuclides regulation. We performed quarterly analysis of water treatment plant effluents for gross alpha, radium 226, radium 228, and uranium. Three out of twelve samples had detectable levels of radium 228, and one out of twelve samples had a detectable level of gross alpha. All detected values were below one-half of the MCL. Radium 226 and uranium were not detected in our water.

VOLATILE AND SYNTHETIC ORGANIC CHEMICALS (VOC and SOC)

Chemical	Highest Level Allowed (EPA's MCL)	Ideal Goal (EPA's MCLG)	Highest Result	Range of Test Results	Source
Atrazine	3 ppb	3 ppb	0.1 ppb	0.0 - 0.1 ppb	Runoff from herbicide used on row crops.
Alachlor	2 ppb	0 ppb	0.14 ppb	0.0 - 0.14 ppb	Runoff from herbicide used on row crops.
Carbofuran	40 ppb	40 ppb	2.0 ppb	0.0 - 2.0 ppb	Leaching of soil fumigant used on rice and alfalfa.

Listed on pages eight and nine are our Drinking Water Quality Results for 2006. All results are better than the recommended federal levels designed to protect public health. We are pleased to report that we did not have any drinking water violations for 2006. In keeping with our long-standing unblemished record, we continue to be free of violations since the Safe Drinking Water Act was implemented in 1974.

By reporting these results in the tables above, we are meeting a requirement of the EPA. Please see the glossary for definitions of abbreviations used in the tables.

Some contaminants may pose a health risk at certain levels. Others, such as turbidity, have no health effects. For information about potential risks, please visit our website (http://www.phila.gov/water), or call us at 215-685-6300. We will be happy to mail them to you.

GLOSSARY

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 process.

E. coli: Human and animal fecal waste.

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.

ntu - nephelometric turbidity units: Turbidity is measured with an instrument called a nephelometer. Measurements are given in nephelometric turbidity units.

pCi/L - Picocuries per liter (a measure of radioactivity).

ppb - part per billion: One part per billion is equivalent to one green apple in a barrel with 999,999,999 red apples.

ppm - part per million: One part per million is equivalent to one green apple in a barrel with 999,999 red apples.

SOC – Synthetic Organic Chemical: Organic compounds, such as pesticides and herbicides, that are commercially made.

Total Coliform: Coliforms are bacteria that are naturally present in the environment and are used as an indicator that other potentially harmful bacteria may be present.

THAAs -Total Haloacetic Acids: A group of chemicals called disinfection byproducts, which form during chlorination.

TOC - Total Organic Carbons: A measure of the carbon content of organic matter. The measure provides an indication of how much organic material in the water could potentially react with chlorine to form THAAs and TTHMs.

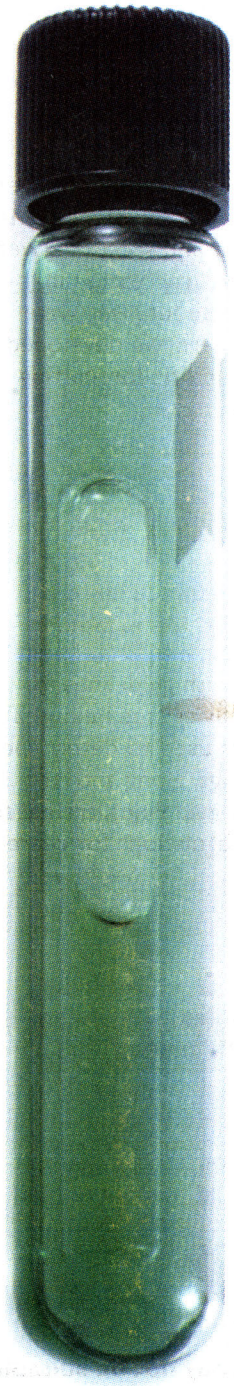
TTHMs - Total Trihalomethanes: A group of chemicals called disinfection byproducts, which form during chlorination. TTHMs form when natural organic matter in the rivers, such as leaves and algae, decompose and combine chemically with the chlorine added for disinfection. Levels of TTHMs vary seasonally.

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 how we remove particles that cannot be seen by the human eye.

VOC – Volatile Organic Chemical: Organic compounds that include gases and volatile liquids.

WTP: Water Treatment Plant



How do we protect our water supplies from pollution?

We carefully safeguard our urban water supply through a variety of practices and research projects designed to protect our rivers and watersheds. Currently, we are undertaking a comprehensive approach to safeguard the region's water environment. This includes integrating our "wet weather" programs – combined sewer overflows and stormwater management – with our drinking water source protection program. But we can't do this alone. We need to partner with stakeholders throughout the watershed to achieve a sensible balance between cost and environmental benefit.

Plans Underway to Protect our Rivers and Streams

During the past several years, we completed Source Water Assessments for the Delaware and Schuylkill rivers. Now that these assessments have been completed, we are moving forward on planning, evaluating, and implementing protection programs for our source waters. Our award-winning Source Water Protection Program is designed to prevent declines in water quality in the Schuylkill and Delaware watersheds. The creation of the Schuylkill Action Network and the Delaware Valley Early Warning System, as well as the Saylor Grove Wetland, are just some of these protection efforts to date. We are also involved in long-term source water protection planning looking at watershed planning issues over the next 100 years, as the area develops, to determine potential future impacts on source water quality.

For information about the quality of our region's rivers and streams, call the Pennsylvania Department of Environmental Protection at 484-250-5900 or check their website (http://www.dep.state.pa.us).

Schuylkill Action Network (SAN)

Created in 2003, the Schuylkill Action Network is just one example of how public and private partnerships are working to protect and restore the Schuylkill River from major pollution threats. In 2004 the Network received a grant from the Environmental Protection Agency to fund projects which were identified during the Schuylkill River Source Water Assessment. This grant was one of only 13 awarded nationally that year.

One of the major threats identified and selected by the Network to receive priority funding is pollution from agriculture. Using mapping software, a decision-support technology called Evamix, conducting visual site assessments, as well as relying on the expertise and diversity of its members, the group settled on 15 farms according to stream length, nearness to stream headwaters, farm size, and other criteria when deciding where to target funds. With limited funds available for environmental protection projects, the Network's efforts demonstrate how superior results can be achieved through collaboration and technology.

Schuylkill River Source Water Protection Plan

The Schuylkill River Source Water Protection Plan provides a comprehensive framework for implementing a watershed-wide effort to improve source water quality. The Plan prioritizes real and potential sources of contamination to Philadelphia's raw water supply, and outlines several approaches to reducing them.

One major component of the Plan is a build-out scenario of the Schuylkill River Watershed that looks at the possible impacts of significant development in the watershed on source water quality. Under current zoning, low-density housing could increase drastically as agricultural and forested lands are developed. If this happens, the amount of impervious cover within the Schuylkill River Watershed is estimated to increase by approximately 8 percent to 18 percent, or roughly 360 square miles. This increase would result in additional stream-channel erosion, reduced water quality, and decreased stream diversity. Actions to help upstream communities develop with fewer impacts on streams were identified in the plan.

The Plan was finalized in December 2005. After PADEP approves the Plan, we will have a state-certified source water protection program, and will install road signage identifying areas of water supply protection. PADEP has provided a $200,000 grant for work on the protection plan. The Delaware River Protection Plan for the Baxter Water Treatment Plant's intake, as well as all other intakes on the Delaware River Watershed, is well underway.

SAN FACTS & FIGURES

SAN Mission:
Protecting and restoring the Schuylkill River as a premiere regional:
- Drinking water source
- Recreational resource
- Natural habitat for fish and wildlife

107: Number of SAN organizations in 2006
4: Number of SAN organizations in 2003

SAN Members
- Citizens
- Non-profits
- Universities
- Funders
- Water suppliers
- Corporations
- Federal, state and local governments

Major Pollution Threats to Schuylkill River
- Agriculture
- Abandoned mine drainage
- Urban and suburban stormwater runoff
- Faulty sewer systems

30: SAN Priority projects tackling major pollution threats

$1.15 million: EPA Targeted Watershed Program Grant Award
$300,000: Funds allocated for agriculture projects

Impaired Stream Miles
258: From agriculture
5: To receiving funding

Farms
800: impairing streams
15: identified for agriculture projects
15: implementing pollution controls
20: outreach by SAN continues

Types of pollution from agriculture:
- Sediment
- Bacteria
- Nutrients

Agriculture pollution control efforts:
- Cattle crossings and fencing to keep animals out of streams
- Plantings to filter nutrients and bacteria

Providing Early Warning Protection

We are leading the development and implementation of the Early Warning System for the Schuylkill and lower Delaware Rivers. This system is an integrated communication and water quality monitoring network that supports the identification, notification and analysis of source water quality events such as chemical spills and other potential hazards.

The system's goal is to provide advance warning of potential source water contamination to water suppliers. Funded in part by a $775,000 grant from Pennsylvania Department of Environmental Protection, the system provides water suppliers on both rivers essential information to make critical treatment and pumping decisions in response to spills and accidents that can have a detrimental impact on the rivers. The Schuylkill and Delaware system is comprised of a partnership of water suppliers and government agencies, a web-based centralized database of water quality and event information, a telephone notification system, and a network of real–time water quality monitors located throughout the watershed.

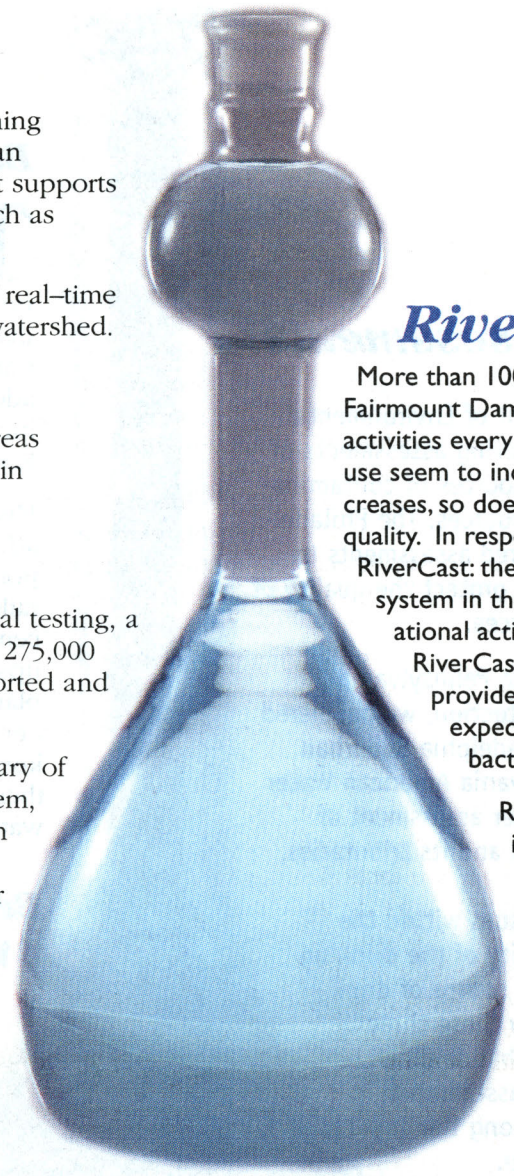
Delaware Valley Early Warning System serves

- Over 3 million people
- Philadelphia, Camden and Trenton Metro areas
- 10 water utilities, 16 water treatment plants in Pennsylvania
- 6 water utilities, 7 water treatment plants in New Jersey

In 2004, when the system was deployed for initial testing, a total of 16 events of significance ranging from a 275,000 gallon oil tanker spill to algae blooms were reported and evaluated.

Since the system became fully deployed in January of 2005, 52 events have been entered into the system, ranging from a 100-million-gallon fly-ash spill on the Delaware and a cyanide discharge in the Wissahickon Creek, to flood warnings and minor sewage discharges.

In each of these cases, the improved awareness, communication, and coordination provided by the system was valuable to our response.



RiverCast

More than 100,000 people use the Schuylkill River at Fairmount Dam ("boathouse row") for recreational activities every year. The amount and scope of river use seem to increase annually. As recreation increases, so does public concern about river water quality. In response to this concern, we developed RiverCast: the first and only bacteria forecasting system in the United States created for recreational activities. Similar to a weather forecast, RiverCast is an internet-based system that provides the public with hourly updates of expected concentrations of fecal coliform bacteria in the Schuylkill River.

RiverCast uses a color rating system to indicate bacteria levels. Each color rating is linked with guidelines for recreational activity (see below). The bacteria ranges used to determine the color ratings, along with the below activity guidelines, are based on draft EPA regulations for recreational waters.

GREEN		
Bacteria	Types of Activities	RiverCast
Low level	jet skiing, kayaking swimming, sculling	recommendation: suitable

YELLOW		
Bacteria	Types of Activities	RiverCast
Level elevated	jet skiing, kayaking swimming, sculling	recommendation: may not be suitable

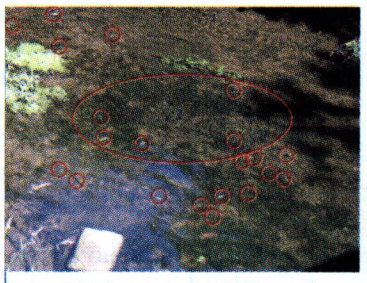
RED		
Bacteria	Types of Activities	RiverCast
Level high	jet skiing, kayaking swimming, sculling	recommendation: not suitable

The website has been visited over 55,450 times and has been used for the planning of major water recreational events such as triathlons and regattas. Visit RiverCast at www.phillyrivercast.org.

Being Prepared

In June 2006, a cyanide spill on the Wissahickon Creek resulted in a significant fish kill and a potential threat to our water supply. When the event occurred, the Pennsylvania Department of Environmental Protection promptly notified the Delaware Valley Early Warning System, which generated an automatic notification to us. This early notification enabled us to begin intensive water sampling to identify the unknown contaminant responsible for the fish kill; to assess the severity of the event based on its impact on aquatic life; and to make a rapid assessment of the situation.

We made the critical decision to temporarily close the Queen Lane and Belmont drinking water intakes in order to safeguard the drinking water supply until further information about the severity of the event became available. We used our RiverCast system to provide public notice about the event and to discourage recreational use of the Wissahickon Creek and Schuylkill River until it was determined that threat of the spill had passed. The early warning notification played a valuable role in our response to this incident, helping us to safeguard our water supply from contamination and protect the health and safety of recreational users in the vicinity of Boathouse Row.



Each circle in this photo identifies the location of some of the fish killed by the cyanide spill . Because of our Early Warning Systems, we were able to ensure the safety of our water supply.

Since the cyanide spill, we have been working with the Wissahickon Partnership on a plan for developing a water-quality monitoring network and an event-based public notification system. We want to provide information to the public as quickly as possible in the event of water quality events on the Wissahickon Creek. The Wissahickon Partnership includes wastewater treatment plants on the Wissahickon, and representatives from the Environmental Protection Agency, the Pennsylvania Department of Environmental Protection, and Wissahickon watershed organizations.

Source Water Assessments

The Pennsylvania Department of Environmental Protection has been conducting assessments of all potentially significant sources of contamination to all public drinking water sources. The Philadelphia Water Department has prepared assessments to support local and State efforts to protect the quality of Philadelphia's drinking water sources.

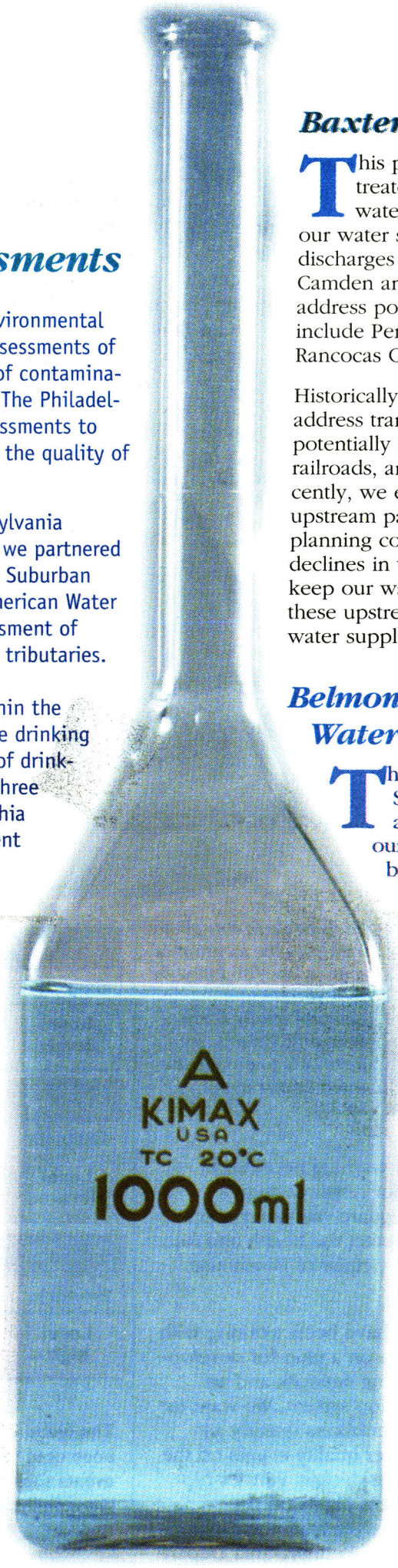
Funded in part by a grant from the Pennsylvania Department of Environmental Protection, we partnered with Aqua America (formerly Philadelphia Suburban Water Company) and the Pennsylvania American Water Company to perform a source water assessment of water intakes along the Schuylkill and its tributaries.

The assessment detailed major issues within the watershed that threaten the quality of the drinking water supply. The river is a major source of drinking water for the public served by these three water utilities. In addition, the Philadelphia Water Department conducted an assessment for seven surface water intakes along the tidal section of the Delaware River.

This summary is for water supply areas for the Philadelphia Water Department's Baxter, Belmont, and Queen Lane water treatment plants. It assesses the raw (untreated river) water only.

For water quality information on our treated "tap" water, please see the charts on pages 8 and 9 of this report.

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 the Philadelphia Water Department at 215-685-6300, visit our website at www.phila.gov/ water, or see Table 2 on page 14.



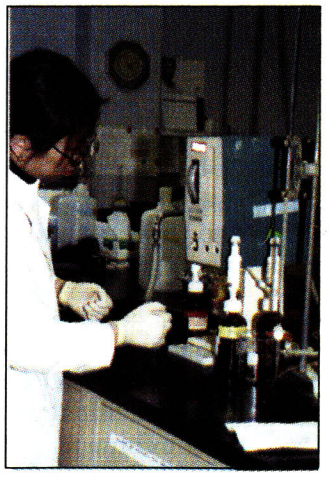
Baxter Water Treatment Plant

This plant, located in the Torresdale section of Philadelphia, provides treated water that comes from the Delaware River. Through a source water assessment report, the State drinking water program found that our water supply is potentially most susceptible to challenges caused by discharges of treated and untreated sewage as well as polluted runoff between Camden and Trenton. Particular tributaries that require special attention to address polluted runoff from urban/residential areas and agricultural lands include Pennypack Creek, Poquessing/Byberry Creek, Neshaminy Creek, Rancocas Creek, Lehigh River, and Musconetcong River.

Historically, we have developed and maintained emergency response plans to address transportation accidents and spills along the Delaware River that could potentially impact the water supply, since it is a working river with barges, railroads, and many other transportation activities on or adjacent to it. Recently, we established a Source Water Protection Program that is working with upstream partners such as watershed organizations, regulatory agencies, planning commissions, municipalities, water suppliers, and farmers to prevent declines in water quality throughout the entire 13,000 square-mile watershed to keep our water supply as clean as possible. It is important for us to work with these upstream organizations because their work has positive benefits for the water supply.

Belmont and Queen Lane Water Treatment Plants

These plants provide treated water that comes from the Schuylkill River in Fairmount Park. Through a source water assessment report, the State drinking water program has found that our water supply is potentially most susceptible to challenges caused by discharges of treated and untreated sewage upstream, polluted runoff from urban areas and agricultural lands, transportation accidents and spills, and abandoned mine drainage. Most of these potential sources are located watershed-wide, but abandoned mine drainage originates over 100 miles upriver near the source of the Schuylkill River in Schuylkill County. Much closer to Philadelphia, the Wissahickon Creek requires special attention from potential sources of pollution due to its potential impacts on source water quality at the Queen Lane intake.



Historically, we have developed and maintained emergency response plans to address accidents and spills that could potentially impact the water supply. Recently, we established a Source Water Protection Program that is working with upstream partners such as watershed organizations, regulatory agencies, planning commissions, municipalities, water suppliers, and farmers to prevent declines in water quality throughout the entire 2,000 square-mile watershed to keep our water supply as clean as possible.

It is important for us to work with these upstream organizations because their work benefits the water supply.

We welcome your ideas and opinions

We participate in nearly 200 public and community events a year, including presentations made at schools, ongoing educational programs, and other environmental celebrations.

We offer ways for individuals, families, students, seniors, community groups and others to participate in learning about and protecting water.

We greatly benefit from our citizens advisory council, which has been working with us over the last few years to improve our communications with our customers. Citizens representing business and industry, education, environmental advocacy, senior citizens, regulatory agencies, and civic and community groups have assisted us in developing public information about a variety of topics, including drinking water quality and storm water pollution prevention.

Interested citizens are welcome to attend our Water Quality Education Citizens Advisory Council meetings. Call our Hotline at 215-685-6300 to confirm the meeting dates, times and locations.

Getting Involved

If you would like to help protect your water supply or watershed, please call the Philadelphia Water Department at 215-685-6300, visit our website at www.phila.gov/water, or see Table 2 on page 14.

How to contact us

You can write to us at:
Philadelphia Water Department
ARAMark Tower
1101 Market Street, 3rd Floor
Philadelphia, PA 19107-2994

You can call our Customer Information Hotline at 215-685-6300.

Interesting facts about Philadelphia's water

Hardness

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. Hardness also affects other water qualities such as its corrosiveness, with naturally soft water being more corrosive.

Cloudy Water

Aeration is the process which takes place when the water flowing from your tap into your glass appears cloudy. This temporary condition is a result of dissolved air being released from the water and being temporarily suspended in the water in your glass. This most commonly happens in the winter time when the cold water in the water mains is warmed up quickly in household plumbing, thereby encouraging the dissolved air to come out of the water.

Temperature

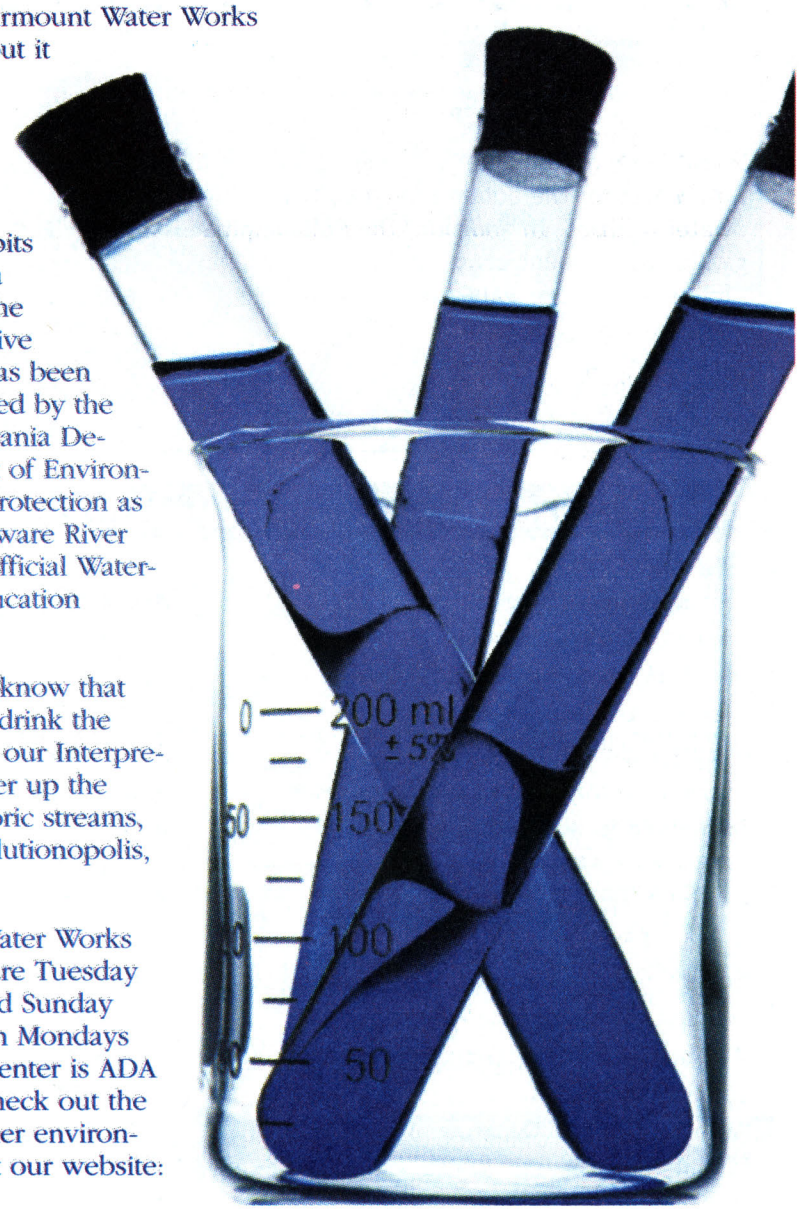
The temperature of both the Schuylkill and Delaware rivers varies seasonally from approximately 36° to 86° F. The Water Department does not treat the water for temperature.

WOW! Water in Our World

Our Fairmount Water Works Interpretive Center is where the water environment comes alive! The Fairmount Water Works stopped pumping water in 1909, but it now has an exciting new life housing the Interpretive Center's exhibits and theater. Activity abounds in the galleries, on the deck, and by the river as school children, families, and other visitors explore the water right outside our window. Our exhibits and programs serve the entire Philadelphia region; the Interpretive Center has been recognized by the Pennsylvania Department of Environmental Protection as the Delaware River Basin's official Watershed Education Center.

Did you know that you can drink the same water that dinosaurs drank? Come to our Interpretive Center where you can pilot a helicopter up the Delaware River, make it rain, re-route historic streams, peak inside a 48-inch water main, visit Pollutionopolis, and more!

The Interpretive Center is located at 640 Water Works Drive, below the Art Museum. Our hours are Tuesday through Saturday, 10:00 am to 5:00 pm, and Sunday from 1:00 pm to 5:00 pm. We are closed on Mondays and city holidays. Admission is free. The Center is ADA accessible. To schedule classroom tours, check out the Center's Saturday Family Programs and other environmental education events at the Center, visit our website: www.fairmountwaterworks.org.



Clean water begins and ends with you

Always recycle or dispose of unwanted 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. So, don't pollute! Recycle these household hazardous materials safely and help protect our waterways. Also, don't flush paint thinners, insect sprays, herbicides and other harmful chemicals 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.

TABLE 1: Who to Call to Report Various Situations

Situation	Who To Call	Phone
Dead Fish	Fish & Boat Commission	717-626-0228
	Fish & Boat Waterways Officer	717-587-0414
	PADEP	800-541-2050
Illegal Dumping & Related Pollution Activities	PADEP	800-541-2050
	Phila. Environmental Police Unit	215-686-3082
Sewage Spills	PADEP	484-250-5900
	PADEP	800-541-2050
	PWD	215-685-6300
Oil & Gas Spills/ Accidents	PADEP	484-250-5900
	PADEP	800-541-2050
	PWD	215-685-6300

Important telephone numbers and Internet addresses

Philadelphia Water Department
215-685-6300
http://www.phila.gov/water

Philadelphia Streets Department
215-686-5560
http://www.phila.gov/streets

U.S. Environmental Protection Agency (Safe Drinking Water Hotline)
800-426-4791
http://www.epa.gov/safewater

Schuylkill River Source Water Assessment
http://www.phillywater.org/schuylkill

Schuylkill Action Network
http://www.schuylkillactionnetwork.org

Philadelphia river and watershed information
http://www.phillyriverinfo.org

RiverCast
http://www.phillyrivercast.org

Fairmount Water Works Interpretive Center
215-685-0723
http://www.fairmountwaterworks.org

TABLE 2 – Places To Go To Get Involved In Protecting Your Local Streams, Rivers, and Water Supply

Organization	Activity Types	Phone Number	Website Address
Friends of the Pennypack	A, C, E, P,T	215-934-PARK	http://balford.com/fopp
Friends of the Wissahickon	A, C, E, P,T	215-247-0417	http://www.fow.org
Friends of Fox Chase Farms	A, C, E, P	215-728-7900	http://www.foxchasefarm.org
Friends of the Tacony Creek Park	A, C, E, P,T	215-745-8903	http://friendsoftaconycreekpark.org
Friends of the Manayunk Canal	A, C, E, P,T	215-483-9238	http://www.manayunkcanal.org
Schuylkill Environmental Education Center	A, B, C, E, P,T	215-482-7300	http://www.schuylkillcenter.org
Partnership for the Delaware Estuary	A, B, C, E, P, S,T	1-800-445-4935	http://www.delawareestuary.org
Environmental Alliance for Senior Involvement	A, C, E, P,T	717-244-6428	http://www.easi.org
Philadelphia Canoe Club	R, F,T	215-487-9674	http://www.philacanoe.org
Friends of Fairmount Fish Ladder	F	215-742-5112	email: epac99@aol.com
Cobbs Creek Environmental Education Center	A, C, E, P,T	215-685-1900	http://www.cobbscreek.org
Wissahickon Restoration Volunteers	A, C, E, P,T	215-951-0339 x101	http://wissahickon.patrails.org
Wissahickon Valley Watershed Association	A, C, E, P,T	215-646-8866	http://www.wvwa.org
Lower Merion Conservancy	A, C, E, P,T	610-645-9030	http://www.lmconservancy.org
Philadelphia Water Department Water Quality Education Citizens Advisory Committee	A, E	215-685-6300	http://www.phila.gov/water
Schuylkill Banks	B,E,L	215-222-6030x103	http://www.schuylkillbanks.org

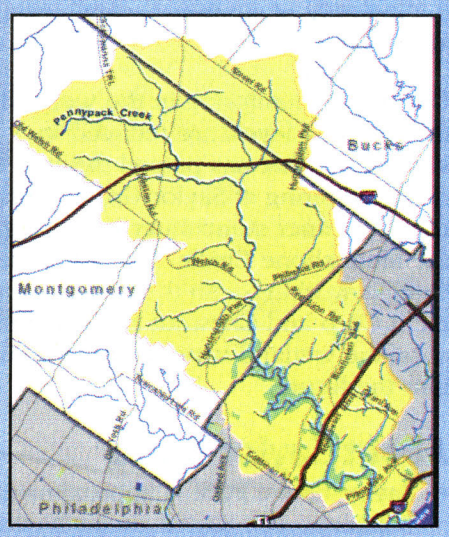
ACTIVITY TYPES

- **A:** Environmental activism
- **B:** Business related protection and education 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

WATER Wheel

Philadelphia PWD Water Department

Clean water begins and ends with you!



Once called "Pennapecka" (deep, slow moving water) by the Lenni-Lenape Indians, the Pennypack Creek flows through agricultural fields, woodlands, suburban developments, and older towns.

Within the City of Philadelphia, the creek meanders through Pennypack Creek Park before emptying to the Delaware River.

Pennypack Creek is an important recreational and cultural resource to some 650,000 people that reside in the watershed. These residents play a critical role in shaping the future of Pennypack Creek.

(Above) Breaking down the walls!

(Below) Freedom!

Pennypack River Conservation Plan Update

If you fish, hike or bike in the Pennypack watershed, you may have noticed that the dams at Frankford and Rhawn Streets have been replaced with a new structure - a rock ramp that lets fish keep swimming – thanks to the Pennsylvania Fish and Boat Commission and its partners.

This project will allow fish to swim in an area that was previously a barrier for migration in the Pennypack Creek. This is great news for the fish, as this project will restore access to approximately 4.5 miles of suitable spawning habitat for migrating fish and will enhance the stream habitat for resident fish populations.

By removing such dams and providing passageways for migratory fish, we are enhancing the aesthetics of the creek, improving the recreational value of the area, and, among other benefits, moving closer to restoration of the creek's ecological functions.

For more information on the Pennypack River Conservation Plan, please visit our website at: http://www.phillywater.org/pennypack .

(continued from previous page)

Saylor Grove: A Natural Way to Protect Our Water

A Wetland in Germantown

Philadelphia's first stormwater treatment wetland, Saylor Grove, is a park and educational area in Fairmount Park's Wissahickon Creek Watershed; one that will filter millions of gallons of urban stormwater every year.

The Philadelphia Water Department, the Fairmount Park Commission, the Pennsylvania Department of Environmental Protection and many other partners have transformed Saylor Grove. The one-acre wetland was completed in March of 2006. Its main purpose is to help to slow down stormwater runoff and to filter polluted stormwater from approximately 156 acres of Germantown – before that stormwater flows into the Monoshone Creek.

Saylor Grove has an educational mission and includes a trail, interpretive signage, historic memorials, sculptures, and a beautified space for visitors to enjoy.

Why a Wetland?

Wetlands clean stormwater, replenish ground water, reduce flooding risks, and provide a home for wildlife. Saylor Grove was chosen to show how wetlands can treat stormwater in an urban environment. We hope that similar wetland projects will be put in place to improve water quality and to help bring back healthy streams and creeks throughout the city and the region.

Stormwater Runoff Impacts

The Monoshone Creek flows alongside Lincoln Drive, just across from Saylor Grove, through Historic RittenhouseTown. Most of Monoshone Creek and its tributaries were routed into sewer pipes over a century ago as the Germantown community grew.

When land is developed, natural features such as vegetation and soil are replaced with hard surfaces, such as pavement and buildings. When stormwater flows across these surfaces, it picks up all of the pollutants in its path – including oil, pesticides, fertilizers, and animal wastes, eventually flowing into nearby water bodies.

Stormwater is both a water quantity and a water quality issue. Polluted stormwater lowers the water quality of our waterways. The force of the stormwater can also harm the banks along the streams, speeding up erosion, displacing fishery habitats, and even destroying the stream banks.

Stormwater and Drinking Water

The Monoshone Creek, and its surrounding smaller watershed are within the Philadelphia Water Department's highest priority zone for drinking water protection – the Queen Lane and Belmont Water Treatment Plant intakes.

The Monoshone is a tributary to the Wissahickon Creek. The Wissahickon empties into the Schuylkill River, near the drinking water intake for Philadelphia's Queen Lane Water Treatment Plant.

Above: Saylor Grove before its transformation.

Below: New paving, benches, and lanscaping make this wetland a place of beauty as well as function.

Because 24% of Philadelphia's drinking water comes from Queen Lane, the health of the entire Wissahickon Creek Watershed, including the Monoshone Creek, is important to all who live and work in Philadelphia.

Protecting and Preservation

At Saylor Grove, the wetland helps treat and hold stormwater before it flows into the Monoshone. The wetland also reduces the quantity of stormwater entering the Monoshone.

Our initial monitoring in the wetland shows that bacteria levels are reduced in stormwater that has passed through the natural filtering at Saylor Grove. This means cleaner stormwater is flowing into the Monoshone Creek. The Water Department is working with the Senior Environment Corp and Chestnut Hill College to continue wetland water quality monitoring into the future.

About Saylor Grove

- Saylor Grove Park is approximately 3.2 acres. The Saylor Grove Wetland is approximately one-half of an acre.
- The wetland drains approximately 156 acres of stormwater runoff from Germantown. The wetland is designed to drain the stormwater within 24 hours.
- The wetland will filter a significant portion of the estimated 70 million gallons of stormwater per year.
- The wetland will remove approximately 13 tons of total suspended solids from the Monoshone Creek.
- The first 0.7 inches of every rainfall event will be treated at the wetland. According to long-term historical data, 70% of all storms make up 0.7 inches or less of rainfall.
- The wetland will increase biodiversity (vegetation and animals). This includes wildlife that eat mosquitoes.
- Approximately 3,000 new species of trees, shrubs, and grasses have been planted.