



## Welcome

**W**elcome to the Chester Water Authority (CWA) Water Quality Report for the 2009 calendar year. This Water Quality Report provides information on how the Authority operates, how we treat your water, and the results of testing we perform on your water. We hope you find it informative.

- We are proud that our water meets all state and federal regulations.
- We are pleased to provide this information to our customers.

This report has been produced in accordance with United States Environmental Protection Agency (EPA) and Pennsylvania Department of Environmental Protection (PADEP) regulations. A short glossary has been provided on page 4 to explain technical terms used in the report.

At Chester Water Authority, we welcome your questions about the drinking water we supply. You'll find information about contacting CWA inside this report. If you have a special health concern, please see the information on page 3.

*Please share this information with other 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 by distributing copies by hand or by mail.*

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## Who is Chester Water Authority?

**W**e are a Pennsylvania municipal authority established in 1939 for the purpose of providing potable water to our customers. We are a public water supplier, and not for profit.

We serve people residing in southwestern Delaware County, Pennsylvania; southern Chester County, Pennsylvania; and northern New Castle County, Delaware. Some of the people we supply are our direct customers. Others receive our water indirectly, through the resale of our water by neighboring water utilities in Pennsylvania and Delaware.



**Este informe contiene información muy importante sobre su agua potable. Tradúzcalo ó hable con alguien que lo entienda bien. Las personas que tengan necesidades medicas especiales, por favor lean la página 3.**

**If you have a special health concern, please see page 3.**

Some people may be more vulnerable to contaminants in drinking water than the general population. Please read the information on page 3 for more details.



## Where does your water come from?

**T**he water you receive is treated and pumped to you from the CWA Octoraro Treatment Plant. In 2009, this facility produced an average of 31 million gallons of drinking water each day.

The water treated at the Octoraro Treatment Plant comes from two sources: the Octoraro Reservoir on the Octoraro Creek, and the Conowingo Pool of the Susquehanna River. Both of these sources are in the Susquehanna River Basin.

## How does CWA water measure up?

**T**he EPA and PADEP have established regulations that require public water systems to monitor for certain contaminants. They have also set limits for the amounts of contaminants that may be present in drinking water.

As your water supplier, we recognize that contaminants may be present in source water. We also understand the responsibility we have to operate the treatment processes of the Octoraro Treatment Plant in such a way that the finished drinking water we produce complies with all drinking water standards. Our mission is to provide quality water to all our customers, when they need it, at a reasonable cost.

**We are proud that in 2009, as in previous years, the water we supplied to you complied with all contaminant limits established by the U.S. Environmental Protection Agency and the Pennsylvania Department of Environmental Protection.**

## About our source water assessment

**I**n 1996, Congress added a Source Water Assessment and Protection program to the Safe Drinking Water Act. This program requires PADEP to identify all untreated surface waters in Pennsylvania that serve as sources of drinking water and to assess their susceptibility to contamination.

An assessment of the Octoraro Reservoir was completed in 1998. It found the reservoir to be most susceptible to contamination by nutrients and sediments from agriculture. The nutrients and sediments contribute to elevated nitrate, phosphorus, bacteria, and organic levels in the reservoir. These, in turn, cause undesirable tastes and odors, algae growth, and siltation. The assessment also identified other potential sources of contaminants, including spills from roads and bridges, residential and municipal wastewater treatment, urban stormwater runoff, and industrial discharges. While the reservoir is potentially susceptible to contaminants from these sources, this contamination is less plentiful and most of it is located some distance upstream.

The Octoraro watershed supplying the Octoraro Reservoir is 139 square miles in area. Approximately 67 percent of the watershed is used for agricultural purposes, 20 percent is forested, 12 percent is residential, and less than one percent is industrial.

The Authority has historically partnered with the Octoraro Watershed Association, a local conservation group, to protect water quality in the Octoraro Creek and the Octoraro Reservoir. The Watershed Association volunteers have worked with farmers to promote good conservation practices and to establish wooded buffer strips along the banks of the tributaries to the reservoir. We are also working with other interested parties to focus the efforts of farmers, residents, conservation districts, and regulators on lowering the elevated nitrate levels that have been measured in the surface and ground water that feed the Octoraro Reservoir.

An assessment of the Susquehanna source was completed in 2003. It found this supply to be most susceptible to agricultural contaminants, spills from roads and bridges, and urban stormwater runoff. It is also susceptible to discharges from wastewater treatment plants, water treatment plants, and industry. The assessment focused on the Lower Susquehanna drainage basin that was within 25 hours' travel time of our intake (approximately 308 square miles).

If you would like to receive a copy of the source water assessment summary for either the Octoraro Reservoir or the Susquehanna intake, please call Chester Water Authority at 800-217-7880.

## What can you do?

**W**ater is a limited resource that can quickly become scarce if we do not take measures to conserve and protect it. To ensure that our water needs will always be met, we must protect our water supplies against pollution and waste. You can help by conserving water. For tips on water conservation, please go to our Web site: [www.chesterwater.com](http://www.chesterwater.com).

## Why do we treat your water?

All water—in rivers, streams, ponds, wells, or anywhere—can become contaminated. Farm animals, automobiles, industries, and the daily activities of people all create waste. If this waste enters a natural body of water like a stream or river, it can cause contamination. That's why we treat all the water we furnish to your home or business.

The sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water 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 occur naturally or can result from urban stormwater 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 stormwater runoff, and residential uses.
- Organic chemical contaminants, including synthetic and volatile organic chemicals, which are by-products of industrial processes and petroleum production, and can also come from gas stations, urban stormwater runoff, and septic systems.
- Radioactive contaminants, which can occur naturally or can be the result of oil and gas production and mining activities.

In order to ensure that tap water is safe to drink, the EPA prescribes regulations that limit the amounts of certain contaminants in water provided by public water systems. Food and Drug Administration regulations establish limits for contaminants in bottled water in order to provide the same protection for public health.

## Cryptosporidium testing

Cryptosporidium is a microbial organism found in rivers and streams throughout the U.S. In 2009, we tested for Cryptosporidium in our Octoraro and Susquehanna source waters and in our finished drinking water. We did not find it in our finished water or in either source.

In 2006, we did find it in one of eight samples from our Susquehanna source. Testing methods do not allow us to determine if the organisms found are dead or if they are capable of causing disease. Our treatment processes include filtration that will remove Cryptosporidium, but this does not guarantee that 100 percent of the organisms will be removed.

Cryptosporidium must be ingested to cause disease, and it may be spread by means other than drinking water. Ingestion of Cryptosporidium may cause an abdominal infection with symptoms including nausea, diarrhea, and abdominal cramps. Most healthy individuals can overcome the disease within a few weeks. However, immunocompromised people are at greater risk of developing life-threatening illnesses. We encourage immunocompromised individuals to consult their doctor regarding appropriate precautions to take to avoid infection.

## If you have a special health concern:

*(continued from page 1)*

Immunocompromised persons, such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or 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 (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 EPA's Safe Drinking Water Hotline at 800-426-4791.

Alguna gente puede ser más vulnerable a los contaminantes en agua potable que la población en general. Las personas inmunocomprometidas tales como personas con los trasplantes del órgano del cáncer que experimentan, la gente con VIH/SIDA u otros desórdenes del sistema inmune, algunos ancianos, e infantes pueden estar determinado en el riesgo de infecciones. Esta gente debe buscar consejo sobre guías de consulta el beber en medios apropiados de aminorar el riesgo de la infección por Cryptosporidium y otros contaminantes microbiológicos están disponibles del teléfono directo seguro del agua potable (800-426-4791).

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 the 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 at 800-426-4791.



## WHAT DOES THAT MEAN?

You may not be familiar with all the terms we use in this report. Here are some definitions to help you.

< : A symbol used to designate “less than.”

**AL (Action Level):** The concentration of a contaminant which, if exceeded, triggers treatment or other requirements that a water system must follow.

**CDC:** Centers for Disease Control and Prevention.

**EPA:** United States Environmental Protection Agency.

**gpg (grains per gallon):** A measurement of water hardness often used to determine detergent requirements for dishwashers or washing machines. One grain per gallon equals 17.12 ppm (see below) of hardness.

**MCL (Maximum Contaminant Level):** The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs (see below) 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.

**MRDL (Maximum Residual Disinfection Level):** The highest level of disinfectant that is allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for 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.

**NTU (nephelometric turbidity unit):** A measure of water clarity.

**PADEP:** Pennsylvania Department of Environmental Protection.

**ppb (part per billion):** One microgram per liter, or one in a billion. This is the relative equivalent of one penny in ten million dollars or one inch in 15,783 miles.

**ppm (part per million):** One milligram per liter, or one in a million. This is the relative equivalent of one dollar in a million dollars or one inch in 15.8 miles.

**source water:** Water in its natural state, before it has received any treatment. Once the water has been treated and is ready to deliver to customers, it is known as finished water.

**TT (treatment technique):** A required process intended to reduce the level of a contaminant in drinking water.

**watershed:** The land area drained by a stream or river. Any rain or snow that falls in the watershed of a stream flows to that stream, traveling to the stream over land or through the ground.

## About Lead in Drinking Water

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 materials and components associated with service lines and home plumbing. CWA is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components. When your water has been sitting 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 or cooking. If you are concerned about lead in your drinking 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 at 1-800-426-4791 or at [www.epa.gov/safewater/lead](http://www.epa.gov/safewater/lead).

## About Fluoride in Drinking Water

Fluoridation of drinking water has been endorsed by the American Dental Association (ADA) since 1950 because of the public health benefit that fluoridation provides in preventing tooth decay. The Centers for Disease Control (CDC) considers drinking water fluoridation one of the ten great public health achievements of the Twentieth Century.

In 1968, Chester Water Authority water received a permit from PA DEP to fluoridate. The optimal range for fluoride in drinking water is 0.7-1.2 ppm of fluoride. In 2009, CWA water contained an average of 0.78 ppm of fluoride.

**For parents (caregivers) of infants:**  
The ADA and the CDC recently recommended the following for the parents of infants:

Parents should consider preparing powdered or liquid concentrate formulas for infants using water that contains no or low levels of fluoride, if reconstituted formula is the primary source of nutrition for the infant. Other sources of infant nutrition could include breast milk or ready to feed (no-mix) formula, both of which are low in fluoride.

Some fluoride is beneficial, but dental fluorosis or mottling of the teeth can occur if an infant receives too much fluoride. Infants are susceptible to receiving too much fluoride due to their low body weight and high fluid intake. Parents should consult with their infant’s doctor and the formula manufacturer for the most appropriate water to use in formula preparation. For more information on infant formula and fluoride refer to CDC at [www.cdc.gov](http://www.cdc.gov) and ADA at [www.ada.org](http://www.ada.org).

# REGULATED SUBSTANCES DETECTED

At our Octoraro Treatment Plant, we are committed to producing clean, quality water for you. In 2009, we conducted more than 55,000 analyses of the drinking water we supply. We tested for 146 substances. The EPA has established standards (MCLs and MRDLs) for 69 of these substances. The EPA requires testing for another 40 substances.

Substance	MCL	MCLG	CWA Water	Unit	Source of Substance
Lead	AL=15	0	5.4	ppb	Home water pipes
	We tested the water in 53 homes, after it had been standing for six hours without being used. Of these, 26 homes were supplied by lead services and 27 homes had copper piping with lead solder connections. There was one lead level greater than 15 ppb found in one of the homes.				
Copper	AL=1.3	1.3	0.220	ppm	Home water pipes

Substance	Testing Period	MCL	MCLG	CWA Average	CWA Values Detected	Unit	Source of Substance
Turbidity	01/2009 to 12/2009	TT	TT	0.03	0.01-0.09	NTU	Source water contaminant from soil runoff
	<p>In 2009, no single turbidity result exceeded 1 NTU and 100% of all turbidity results were less than 0.3 NTU, achieving the treatment technique requirement for turbidity removal.</p> <p>As a member of the Partnership for Safe Drinking Water, our treatment goal is to achieve 0.1 NTU or less. We monitor turbidity because it is a good indicator of the effectiveness of our filtration system.</p>						
Fluoride	01/2009 to 12/2009	2	2	0.78	<0.50-1.19	ppm	Water additive that promotes strong teeth
Nitrate	01/2009 to 12/2009	10	10	6.1	3.1-9.0	ppm	Source water contaminant from fertilizer use
	Nitrate in drinking water at levels above 10 ppm is a health risk for infants less than six months of age. High nitrate levels in drinking water can cause blue baby syndrome. Nitrate levels may rise quickly for short periods because of rainfall or agricultural activity. If you are caring for an infant, you should ask advice from your health care provider.						
Total Organic Carbon	01/2009 to 12/2009	TT	TT	2.1	1.6-3.1	ppm	Naturally present in the environment
	Required removal of total organic carbon (TOC) varies with source water quality. In 2009, the minimum required TOC removal varied from 35%-45%. CWA achieved 40%-64% removal, meeting the treatment requirements for TOC removal.						
Chloramines	01/2009 to 12/2009	MRDL of 4	MRDLG of 4	1.73	1.40-1.99	ppm	Water additive used to control microbes
	01/2009 to 12/2009			2.49	1.6-2.7		
Total Trihalomethanes	01/2009 to 12/2009	an average of 80	not applicable	48.9	30.2-57.0	ppb	By-product of drinking water chlorination
Haloacetic Acids (HAA5)	01/2009 to 12/2009	an average of 60	not applicable	39.8	18.9-79.6	ppb	By-product of drinking water chlorination
Total Coliform	01/2009 to 12/2009	5% of monthly samples are positive	0	not applicable	0-0.8	%	Naturally present in the environment
Barium	04/2009	2	2	not applicable	0.028	ppm	Erosion of natural deposits
Atrazine	04/2009 to 07/2009	3	0	not applicable	<0.1-0.3	ppb	Runoff from herbicide used on row crops

# SUBSTANCES NOT DETECTED

In 2009, *none* of the following Synthetic Organic Contaminants, Volatile Organic Contaminants, Microbiological Contaminants, or Inorganic Contaminants were detected in water supplied by Chester Water Authority.

**Synthetic Organic Contaminants Including Pesticides and Herbicides**

Alachlor, Aldicarb, Aldicarb sulfone, Aldicarb sulfoxide, Benzo(a)pyrene, Carbaryl, Carbofuran, Chlordane, 2,4-D, Dalapon, Dibromochloropropane (DBCP), Dicamba, Di(2-ethylhexyl)adipate, Di(2-ethylhexyl)phthalate, Dinoseb, Diquat, Endothall, Endrin, Ethylene dibromide (EDB), Heptachlor, Heptachlor epoxide, Hexachlorobenzene (HCB), Hexachlorocyclopentadiene, 3-Hydroxycarbofuran, Lindane, Methomyl, Methoxychlor, Metolachlor, Metribuzin, Oxamyl (vydate), Pentachlorophenol (PCP), Picloram, Simazine, Toxaphene, 2,4,5-TP (silvex)

**Inorganic Contaminants**

Antimony, Arsenic, Beryllium, Cadmium, Chromium, Cyanide, Mercury, Nickel, Selenium, Thallium

**Microbiological Contaminants**

Cryptosporidium, Fecal coliform

**Volatile Organic Contaminants**

Benzene, Carbon tetrachloride, Chlorobenzene, 1,2-Dichlorobenzene, 1,4-Dichlorobenzene, 1,2-Dichloroethane, 1,1-Dichloroethylene, cis-1,2-Dichloroethylene, trans-1,2-Dichloroethylene, Dichloromethane, 1,2-Dichloropropane, Ethylbenzene, Methyl-tert-butyl-ether (MTBE), Styrene, Tetrachloroethylene, Toluene, 1,2,4-Trichlorobenzene, 1,1,1-Trichloroethane, 1,1,2-Trichloroethane, Trichloroethylene, Vinyl chloride, Xylenes, total

## OTHER 2009 WATER QUALITY DATA

The data below is for all water pumped from the Chester Water Authority Octoraro Treatment Plant during 2009.

Substance	CWA Average	CWA Values Detected	Unit
Alkalinity, total	47	27-64	ppm <i>(as calcium carbonate)</i>
Aluminum	15	<10-40	ppb
Ammonia	0.52	0.30-0.84	ppm as Nitrogen
Chloride	34	26-45	ppm
Conductivity	316	240-360	µmhos/cm @ 25°C
Hardness, total	6.5	5.0-7.9	gpg <i>(as calcium carbonate)</i>
Iron, total	6	<10-50	ppb
Manganese	13	<10-36	ppb
pH	7.9	7.7-8.4	
Phosphorus, total	21	<1-92	ppb
Silica	5.2	<2-8.6	ppm
Sodium	9.5	5-15.1	ppm
Solids, total	216	173-364	ppm
Sulfate	27.9	14.0-40.9	ppm

# UNREGULATED CONTAMINANT MONITORING

In 2009, CWA performed special monitoring as part of the Unregulated Contaminant Monitoring Regulation (UCMR), a nationwide monitoring effort conducted by the EPA. Unregulated contaminants are those that do not yet have a drinking water standard set by EPA. The purpose of monitoring for these contaminants is to help EPA decide whether the contaminants should have a standard.

## Substances Detected

Substance	Testing Period	CWA Average	CWA Values Detected	Unit	Sample Location	Source of Substance
Metolachlor ESA	01/2009 to 12/2009	0.38	<1.0-1.5	ppb	treatment plant	Degradation of metolachlor. Metolachlor is a broad-spectrum herbicide widely used in crops.
N-nitroso-dimethylamine (NDMA)	01/2009 to 12/2009	0.0027	<0.002-0.0059	ppb	distribution system	Nitrosamines can form spontaneously by reaction of precursor amines with nitrosating agents (nitrate and related compounds), or by action of nitrate-reducing bacteria. Foods such as bacon and malt beverages can contain nitrosamines; there is also evidence that they form in the upper GI tract.

### Unregulated Contaminants not detected at sample location at treatment plant

acetochlor, acetochlor ESA, acetochlor OA, alachlor, alachlor ESA, alachlor OA, metolachlor, metolachlor OA, dimethoate, terbufos sulfone, 1,3-dinitrobenzene, 2,4,6-trinitrotoluene, 2,2',4,4',5,5'-hexabromobiphenyl (245-HBB), 2,2',4,4',6-pentabromodiphenyl ether (BDE-100), 2,2',4,4',5,5'-hexabromodiphenyl ether (BDE-153), 2,2',4,4'-tetrabromodiphenyl ether (BDE-47), 2,2',4,4',5-pentabromodiphenyl ether BDE-99), hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX), N-nitroso-di-n-butylamine (NDBA), N-nitroso-diethylamine (NDEA), N-nitroso-di-n-propylamine (NDPA), N-nitroso-methylethylamine (NMEA), N-nitroso-pyrrolidine (NPYR), N-nitroso-dimethylamine (NDMA)

### Unregulated Contaminants not detected at sample location in distribution system

N-nitroso-di-n-butylamine (NDBA), N-nitroso-diethylamine (NDEA), N-nitroso-di-n-propylamine (NDPA), N-nitroso-methylethylamine (NMEA), N-nitroso-pyrrolidine (NPYR)



## CHESTER WATER AUTHORITY'S SERVICE AREA

Aston Township  
Bethel Township  
Birmingham Township  
Brookhaven Borough  
Chadds Ford Township  
Chester Heights Township  
Chester Township  
City of Chester  
Concord Township  
E. Marlborough Township  
E. Nottingham Township  
Franklin Township

Kennett Square Borough  
Kennett Township  
Little Britain Township  
Londonderry Township  
London Grove Township  
Lower Chichester Township  
Lower Oxford Township  
Marcus Hook Borough  
Middletown Township  
Nether Providence Township  
New Garden Township  
New London Township

Oxford Borough  
Parkside Borough  
Penn Township  
Pennsbury Township  
Thornbury Township,  
Chester County  
Thornbury Township,  
Delaware County  
Trainer Borough  
Upland Borough  
Upper Chichester Township  
Upper Oxford Township

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**Chester Water Authority**  
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### IF YOU WOULD LIKE MORE INFORMATION:

If you would like more information regarding Chester Water Authority, please contact our Customer Service Department at 610-876-8181 or 800-793-2323, or visit our Web site at [www.chesterwater.com](http://www.chesterwater.com).

If you have a specific concern or question regarding water quality, you may contact the CWA Water Quality Laboratory during normal business hours at 800-217-7880.

Meetings of the Chester Water Authority Board of Directors are held the third Thursday of every month at 2:00 PM at the Authority's offices, located at 415 Welsh Street in Chester, Pennsylvania.

Information about the Octoraro Watershed Association may be obtained directly from the association at 517 Pine Grove Road, Nottingham, PA 19362, or by calling 717-529-2132.

**Business Hours & Phone**  
**Walk-in: 8:00 AM to 5:00 PM**  
**Telephone: 8:00 AM to 7:00 PM**  
**Monday through Friday**  
**Telephone: 610-876-8181**  
**800-793-2323**

**Emergency Hours & Phone**  
**24 HOURS PER DAY**  
**7 DAYS PER WEEK**  
**Telephone: 610-876-8181**

**Web site: [www.chesterwater.com](http://www.chesterwater.com)**

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This report is being mailed to you as a requirement of the federal Safe Drinking Water Act.