BUFFALO WATER BOARD MEMBERS

Victoria J. Saxon	Chairman
Warren Galloway	Vice Chairman
John R. Sole	Board Member
James B. Milroy	Board Member
Patrick W. H. Wesp	Board Member
Charles E. McGriff	Board Member

Water Treatment Plant
American Water Services, Inc.™
2 Porter Avenue
Buffalo, NY 14201

Billing Office
American Water Services, Inc.™
281 Exchange Street
Buffalo, NY 14204

Important Service Numbers

To Report Leaks:
Dispatch - - - - - - - - - - - - - - - - - 851-4747
Dispatch - - - - - - - - - - - - - - - - - - 851-4748
Dispatch - - - - - - - - - - - - - - - - - - 851-4749

Billing and Customer Service Number - - - - - - - - - - - - - - 847-1065

Meter Installations - - - - - - - - - - 852-0197
Meter Repair - - - - - - - - - - - - - 851-4741

Service Inspections - Final Reads on Meter Inspectors - - - - - - - - - - - - - - - - 851-4782

Filter Plant ---------- - - - - 851-4720
Filter Plant Laboratory - - - - - 851-4704
Water Treatment Supervisor - - - 851-4726

www. ci.buffalo.ny.us

For health issues, contact
Erie County Dept. of Health
716-858-7677

City of Buffalo- Division of Water
Managed by
American Water Services, Inc.™
An American Water Works Company

BUFFALO WATER AUTHORITY 2003 - 2004
WATER QUALITY REPORT

Managed by
American Water Services, Inc.™

Anthony M. Masiello
Mayor

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Commissioner of Public Works

Victoria J. Saxon
Chairperson, Buffalo Water Board

Stephen Siegfried
Regional Manager, AWS,Inc.

James Campolong
Project Manager, AWS,Inc

Buffalo's Water Front

Water is Life … Don't Waste it!

Introduction

The following is the 10th annual water quality report prepared by the Buffalo Water Authority managed by American Water Services, Inc. ™. The purpose of this report is to raise your understanding about drinking water and awareness of the need to protect our drinking water source. This report provides an overview of last years water quality. Included are details about where your water comes from, what it contains, and how it compares to State standards.

Last year, your tap water met all State and Federal drinking water health standards. We are proud to report that our system did not violate a maximum containment level or any other water quality standard

If you have any questions about this report or concerning your drinking water, please contact:

Leonard Milioto

Water Treatment Supervisor
2 Porter Ave, Buffalo, NY 14201
Tel: (716) 851-4726, Fax: (716) 851-4672

We want you to be informed about your drinking water. If you want to learn more, please attend any regularly scheduled Water Board meetings. For times and location, please see the local newspaper.

For Health Issues contact:
Erie County Health Department
95 Franklin Street
Buffalo, NY 14202
(716) 858-7677

The Future of Buffalo's Water Treatment

On September 1997 the City of Buffalo commissioned AmericanAnglian Environmental Technology (AAET) to manage the Buffalo Water Authority. AAET was a joint venture between American Water (the largest US water utility) and Anglian Water. Together, they operate over 1000 treatment plants, servicing 13 million people in 5 continent. In 1999 American Water took over Anglian Water's interest in AAET and the company was renamed American Water Services, Inc. ™ . .

To insure continuing quality and safety in our communities' water supply, the Buffalo Water Board plans the following improvements to our treatment facility in 2004

- ➔ Retrofit South Coag. Basin with a weir wall to aid filtration and improve water quality.
- ➔ Filter bed rehabilitation: More effective filtration will increase water quality and lower its cost.
- ➔ Optimization of treatment to reduce cost.
- ➔ Metering program. Metering will encourage water conservation and curtail unaccounted water.
- ➔ Leak Detection. To reduce non revenue water usage and the amount of water treatment and pumpage needed to supply the city with water.

In 2004 rehabilitation of our filter beds will optimize water treatment

Metering Program

This program has been mandated by New York State's Department of Environmental Conservation. In general, the water meter project will either replace existing meters or "convert" all flat rate water service to metered accounts using the most automated water meters available. These meters can be read from outside the home and accurately bill you for the amount of water that has been used, in the same way that you are currently billed by other utilities.

FLAT RATE TO METERED BILLING CONVERSIONS
IMPORTANT INFORMATION ABOUT YOUR NEW METER

Maintenance Your new meter should register and run without any problems for fifteen years or more. The City of Buffalo owns and maintains the meter only and will replace any meter that fails due to mechanical problems at no charge to you. There is a charge for repairing meters, cables or remotes that are damaged willfully or through the neglect of the property owner. Meters must be protected from freezing if they are located in an unheated area.

Meter Reading The remote reading device placed on the outside of your home allows us to accurately read the meter without entering your home. Please do not disturb the remote device or the wire between it and the meter, or place any objects directly in front of the remote device that would make access to this device difficult for the meter reader.

Meter Billing The City of Buffalo currently reads and bills metered accounts quarterly. Metered customers are billed for the actual amount of water used during the quarterly period; bills are processed and mailed within approximately 30 days following the previous quarter. Plans are currently being reviewed to change to monthly billing for metered customers; you will receive information about this change in the future.

Billing Cycle Depending upon the timing of your new meter installation, you may receive a flat rate bill for your property before the new-metered account is set up. If you have already received a flat rate bill, or receive one before the metered account is established, please disregard this bill. You will receive a notice from the billing department with information regarding any credits or monies owed on your flat rate account. Because of the time required to set up a new-metered account, it could take anywhere from 30 to 60 days to process this new account. Even though your first metered bill may be delayed, you will still only pay for the amount of water you actually used.

Water Conservation Conservation is one of the primary goals of the metering program. In order to conserve water, people must know how much water they actually use. To conserve water, and to keep your bills low, fix any leaky fixtures in your house or building. Additional conservation tips have been made available to you to help you better understand this important measure.

If you have any questions regarding your bill, please contact our customer service department at 847-1065.

Abbreviations & Definitions

MCLG (*Maximum contaminant level goal*): The level of contaminant in drinking water below which there is no known or expected risk to health, MGLGs allow for a margin of safety.

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

MRDL (Maximum Residual Disinfectant Level**:** The highest level of a disinfectant (chlorine) allowed in drinking water (4.0 ppm). There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.

MRDLG (Maximum Residual Disinfectant Level Goal)**:** The level of a drinking water disinfectant (chlorine) below which there is no known or expected risk to health. MRDLG's do not reflect the benefits of the use of disinfectants to control microbial contaminants (4.0 ppm).

TT (*Treatment Technique*): A required process intended to reduce the level of contamination in drinking water.

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

NTU (*Nephelometric Turbidity Units*): A measure of clarity (turbidity) of water; turbidity in excess of 5NTU is just noticeable to the average person.

Turbidity is a measure of the cloudiness of the water. We monitor it because it is a good indicator of the effectiveness of our filtration system. State regulations require that turbidity must always be below 5 NTU. The regulations require that 95% of the turbidity samples collected have measurements below 0.5 NTU.

ortho- phosphate: A chemical blend used as a TT used to reduce the level of lead and copper contamination in drinking water.

ppm: Parts per million, or milligrams per liter (**mg/L**).

n/a (NA): Not any. **NLS:** No limit set. **ND:** Not Detected.

ppb: Parts per billion, or micrograms per liter (**µg/L**).

TTHM (*Total Trihalomethane*): Organic compounds, which are disinfection by-products of the chlorination of drinking water. Some people who drink water containing TTHMs in excess of the MCL over many years may experience problems with their liver, kidneys, or central nervous system, and may have an increased risk of getting cancer.

90th % Value: The value reported for lead & copper represents the 90th %. A % is a value on a scale of 100 that indicates the % of a distribution that is equal to or below it. The 90th % is equal to or greater than 90% of the lead & copper values detected at your water system.

The History of Water Treatment

The need for a clean, reliable source of water has been a driving force of human civilization. Population centers would accumulate and grow around areas of clean water. Ancient humans recognized that a source of nearby water was a necessity. Its presence was essential to all life, not just for their own uses, but critical for the animals they hunted, and plants they harvested.

Only after the Dark Ages, due to advances in science and technology, was there a general realization that clean looking water was not necessarily safe water. Before the invention of the microscope, the idea of microscopic life was unimagined. Even with that tool it still took over 200 years before a connection between microbes and disease was made. In the mid 19th Century it was proven that cholera was spread by contaminated waters. By the late 19th Century, Louis Pasteur developed the particulate germ theory of disease, which finally established a cause and effect relationship between microbes and disease.

Filtration of water was established as a method of clarifying water in the 18th Century. In 1832 the first municipal water treatment plant was built in Scotland. Unfortunately the aesthetic properties of the water were the major concerns of the time, while effective water quality standards remained absent until the late 19th Century.

In the US, municipal water systems originated as early as 1799, by 1860 over 400 were in service providing water to major cities and towns. Because water quality standard were lacking, these systems contributed to major outbreaks of disease by spreading pathogenic organisms.

In the 1890's effective water treatment techniques began to develop. Coagulation and rapid sand filtration were instituted, which significantly reduced both turbidity and bacteria in water supplies. Chlorination of water was eventually introduced in 1908. Finally a community's water supply could, in fact, be considered safe.

Buffalo's water system history began in 1827, when the Buffalo & Black Rock Jubilee Water Works was formed. It supplied well and spring water through an assemblage of wooden pipes. In 1852 the Buffalo Water Works Co. formed, and pumped its water from the Niagara River. The City of Buffalo purchased both companies in 1868 and began construction of an Intake and tunnel system in the Niagara River. This location proved unfortunate. River turbulence and shoreline pollution caused a public outcry for a new intake. In 1913 this new intake was completed. It was located upstream from the original one, in Lake Erie's Emerald Channel. In 1914 Buffalo began chlorinating its delivered water, and in 1926 the Water Treatment Plant was built utilizing coagulation and filtration along with disinfection of its delivered water.

More Water Saving Tips

Leak Detection

- Check the small red (leak detection) dial, found between the 7 & 8 on the face of the new water meter. If this dial is turning when you think the water is not being used, this indicates a leak somewhere inside the house.

- Check for leaks from faucet. A slow drip can waste 15 to 20 gallons a day, fix it and save 6,000 gallons per year. Most leaks are caused by worn out washers, which often can be repaired by the home owner.

- Check for leaks from toilet tanks by putting a few drops of food coloring in the tank. Without flushing; wait 10 to 15 minutes; if the color shows up in the bowl, you have a leak. It's possible to lose up to 100 gallons a day from an "invisible leak", that's more than 30,000 gallons per year. Nearly 90% of all residential leaks are caused by leaks from toilet tanks.

- Check for leaks from tub faucets and showers. Replacing old shower heads with low flow models can save 5 to 10 gallons per minute.

- Detect for leaks on service lines by listening for a "hissing" noise at your water meter when no water is being used inside the house. You could have a water line that goes to another building, such as: (1) front house to rear building; (2) house to garage. If you suspect a problem, you should contact your plumber to check this out.

* Note that water loss due to leaks in a multi-family building are multiplied by the number of units in the complex.

Water Loss In Gallons					
Leak this Size	Loss Per Day	Loss Per Month	Leak this Size	Loss Per Day	Loss Per Month
•	120	3,600	●	6,640	199,520
•	300	10,800	●	6,964	209,520
●	693	20,790	●	8,424	252,720
●	1,200	36,000	●	9,585	296,640
●	1,920	57,600	●	11,324	339,720
●	3,095	92,880	●	12,750	361,600
●	4,295	128,880	●	14,952	448,560

Water Conservation

Water is a vital and limited resource. It is crucial to conserve water. Between the years 1980 and 2000 Americans have more than doubled their water usage. In many areas severe shortages already exist. We must learn to conserve water now, to avoid severe shortages in the future.

By saving water you can also reduce your water, sewer, and utility bills while easing the burden on water storage, purification, distribution, and treatment.

There are four basic ways to save water: economize, repair leaks ,install water- saving devices, reuse water.

Water Saving Tips

The following are some water saving suggestions that you may find useful:

➢Dishwashing: Wash dishes in standing water after you wipe grease off dishes with a paper towel or cloth. Turn off faucet frequently, and you will save over 20 gallons of water a day. Soak pots and pans before washing.

➢Tooth-brushing: Don't let water run while you brush your teeth. Rinse your mouth with water in a glass and you will save over a gallon of water each time you brush.

➢Shower & Bath: Plug the drain before you run water. Take shallow baths. Keep showers short with pressure at low force. Bathe small children together. Reuse bath water to water lawns and shrubs, and for heavy cleaning jobs (e.g. floors, cars, etc.).

➢Sink: Fill bowl with water instead of letting water run when you wash or shave. Try a faucet aerator to reduce the amount of water used.

➢Toilet: Flush only when necessary. Don't use as a wastebasket for cigarette butts or disposable diapers. Install water saving displacement devices.

➢ Laundry: More than 10% of all water used in the home is used in the washing machine. Use the load selector to match water level to size of load. Try to wash full loads whenever possible. Presoak heavily soiled items. If buying a new washing machine, choose one with conservation features.

➢Cleaning: Use a pail or basin instead of running water. Use sponge mops instead of string mops (uses less water for mopping and takes less water to keep clean).

➢Lawn & Garden: Water slowly and thoroughly during cool, shady, and windless times of the day. Let grass grow taller in hot weather. Use judicious amounts of mulch in the garden and around shrubs to conserve moisture. Plant shrubs that don't need a lot of watering.

➢Car Washing: Wet car quickly, turn hose off, wash car from a bucket of soapy water, and rinse quickly with hose. Used water is fine for cleaning chrome, hubcaps, and wheels.

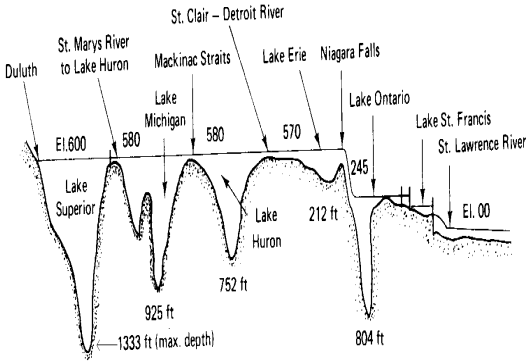
Raw Water Source

The source of all Buffalo's water is Lake Erie. Lake Erie is the shallowest of the Great Lakes, with an average depth of only 62-ft. It also has the shortest detention time of the Great Lakes. Water remains in the lake for only 2.6 years before it is replaced by fresh water (as compared with 191 years in Lake Superior or 22.6 years in Lake Huron). It is also the siltiest of the Great Lakes. Its bottom consists of finely grated sand, easily upset during turbulent storms.

The combination of its shallowness, short detention time and sandy unstable bottom bestows a great asset upon this body of water. The lake is able to quickly flush itself of harmful contaminants such as pesticides and other organic wastes. When Lake Erie becomes turbulent, fine particles of sand and silt become agitated and suspended throughout the lake. Organic contaminants will tightly cling to these particles and will be quickly flushed from the lake. Therefore water treatment begins as a natural process due to the structure and makeup of Lake Erie.

Lake Erie Facts and Figures

Length: 241 miles, Width: 57 miles, Avg. Depth: 62', Max Depth: 210', Vol.: 116 miles³ Surface area: 9,910 miles², Drainage Basin Area: 30,140 miles², Shoreline: 871 miles, Elevation: 569', Outlet: Niagara River & Welland Canal.



Water Treatment

Emerald Channel Intake

Buffalo's water intake is located in the northeastern region of Lake Erie, just before water enters the Niagara River. This region is known as the Emerald Channel, due to the sparkling clarity of its water. Water rushes into the intake through grates and collects in a circular pool where it drops 60 feet to a 12-foot diameter, mile-long tunnel burrowed under the lakebed. The water is gravity fed to an onshore screen house. There traveling screens remove large objects such as sticks and other debris that can damage pumps.

Gravity delivers the water through a conduit where chlorine, fluoride, and polyaluminum chloride (PACl) are added. Chlorine is used to disinfect the water, control zebra mussels and other organisms. Fluoride is added to guard against tooth decay. PACl is a chemical coagulant designed to cause fine particles in the water to bind together forming floc.

Pumps direct the rushing water to an underground basin for flocculation and sedimentation. At the flocculator area, the water is slowly mixed by mechanical paddles to enhance floc formation. This treated water then travels to the settling basins where the heavy floc is allowed to settle out by gravity. .

The water, still containing light floc, is directed over rapid sand filter beds where filtration occurs, removing fine floc. A filter aid (a non-ionic polymer) is added, when necessary, to enhance filtration.

As the water leaves the plant, a corrosion control additive (a sodium orthopolyphosphate blend) is used. This serves as a shield against lead leaching into the water from aged residential water pipes and service lines.

The quality and safety of the water is tested by an in house laboratory at every stage of the treatment process. The final product is pumped through the water mains to the community, where further tests are conducted from samples taken throughout the city, including private homes, businesses and public facilities ensuring that water continues to remain high in quality and safety, at your tap.

Consumer Tips

➔Appearance

■If your cold tap water appears brown or red it is probably mineral deposits (tuberculation) in your water caused by :

- a water main break
- water or sewer workers flushing fire hydrants
- vibrations caused by construction
- children playing with fire hydrants

To report these problems,call the water dept. at 851-4704 or 851-4749. Once the reason has been identified and the disruption of the water main has ceased, run your cold water tap until it clears.

■If your water appears cloudy in winter or early spring it is most likely trapped air. Cold water has a much greater capacity to hold gas than warm water, and if this tendency is combined with a faucet aerator, your water may appear cloudy due to air bubbles. If the water is allowed to sit for a short while, the bubbles will eventually rise to the surface and dissipate.

➔Taste & Odor

■After chlorination there remains minute amounts of chlorine in tap water known as residual chlorine. This residual is necessary to kill pathogenic organisms in the water. Many consumers dislike the inherent taste. The following are some ways to eliminate or improve this taste:

- Expose water, in a clear uncapped bottle, to sunlight for one hour, and the smell of chlorine will be removed.
- Cool water to less than 60ºF in the summer. Cool water definitely tastes better. If the smell of chlorine is removed before cooling, the taste will be much better.
- Leave water in a kettle overnight. The smell of chlorine will be removed.
- Boil water for 5 minutes in a kettle with the lid off, cool to room temperature, then place in a refrigerator with the lid on, but not air tight, until cool.
- A well-maintained point-of-use charcoal filter will eliminate the smell of chlorine.

Drinking Water Standards

The Synthetic Organic Compounds listed below were tested for in our 2002 finished water, but were not detected. No MCL has been assigned to these SOC's		
2,4,5-T	ACENAPHTHENE	2,3-DICHLOROBIPHENYL
2,4-DB	ACENAPHTHYLENE	2-4-DINITROTOLUENE
4,4'-DDE	ACETOCHLOR	2-6-DINITROTOLUENE
4,4'-DDT	ACIFLUORFEN	2-CHLOROBIPHENYL
BENTAZON	ANTHRACENE	alpha-CHLORDANE
BROMACIL	CYANAZINE	BENZO(A)ANTHRACENE
CHRYSENE	DICHLORPROP	BENZO(B)FLUORANTHENE
DACTHAL	FLUORANTHENE	BENZO(g,h,i)PERYLENE
EPTC	METHIOCARB	BENZO(K)FLUORANTHENE
FLUORENE	NAPHTHALENE	BUTYLBENZYLPHTHALATE
MOLINATE	PHENANTHRENE	DIETHYLPHTHALATE
PROMETON	PROPAZINE	DIMETHYLPHTHALATE
PYRENE	THIOBENCARB	DI-N-BUTYLPHTHALATE
TERBACIL	TRIFLURALIN	trans-NONACHLOR
2,2',3,3',4,4',6-HEPTACHLOROBIPHENYL		
2,2',3,3',4,5',6,6'-OCTACHLOROBIPHENYL		
2,2',3',4',6-PENTACHLOROBIPHENYL		
2,2',4,4',5,6'-HEXACHLOROBIPHENYL		
2,2',4,4'-TETRACHLOROBIPHENYL		
2,4,5-TRICHLOROBIPHENYL		
3,5-DICHLOROBENZOIC ACID		
DIBENZO(a,h)ANTHRACENE		
INDENO(1,2,3-cd)PYRENE		

TRIHALOMETHANES for 2003	MCL ppb	# of samples	Avg ppb	Min ppb	Max ppb
BROMOFORM	50	17	0.03	ND	0.51
BROMODICHLOROMETHANE	50	17	7.9	4.6	13.0
CHLORODIBROMOMETHANE	50	17	3.8	2.1	6.3
CHLOROFORM	50	17	11.3	3.7	23.0
TOTAL TRIHALOMETHANES	80	17	23.1	11.8	42.8

HALOGENATED ACETIC ACIDS (HAA) for 2003	MCL ppb	# of samples	Avg ppb	Min ppb	Max ppb
DIBROMOACETIC ACID	60	17	0.46	0	2.3
DICHLOROACETIC ACID	60	17	4.94	2.5	7.9
MONOBROMOACETIC ACID	60	17	0	0	0
MONOCHLOROACETIC ACID	60	17	0	0	0
TRICHLOROACETIC ACID	60	17	4.83	2.3	8.4
TOTAL HAA5	60	17	10.18	4.9	16.0
BROMONCHLOROACETIC ACID	n/a	17	2.86	1.6	5.8

Water Distribution

Water is essential for all life. Besides drinking, bathing and recreation, water is used to fight fire, and has countless industrial applications. The City of Buffalo treated 34.5 billion gallons last year with an average of 95 million gallons each day to a population of approximately 290 thousand people, covering 46 square miles of piping network. This water must be transported, after treatment, throughout the city. Pumps transport the treated water from a 28 million-gallon clear well, located below the filter beds, through two large conduits. The water travels through 800 miles of pipes and 25,000 valves to 90,000 service connections and 7,800 fire hydrants.

This enormous network of pipes, valves, service connections and hydrants is maintained, day and night, throughout all seasons. In the past year the Buffalo Water Authority has replaced or renovated approximately 5.2 miles of water mains.

Customer Costs

Our customer's billing rates are among the lowest in the state. **The average 2003annual water bill was only $257 per year.** The total quarterly bill includes the cost of water used and the service charge. Senior Citizens receive a significant discount.

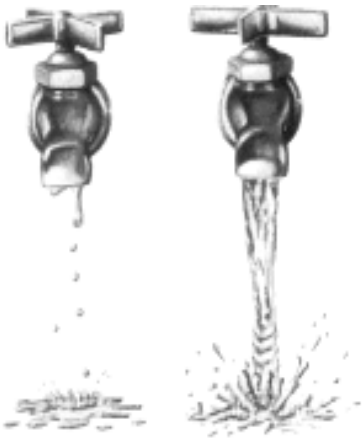
Water Usage (Gallons)	Regular Rate Price per 1000 gallons	Senior Rate Price per 1000 gallons
Up to 67,320	$1.69	$1.02
Over 67,320–269,280	$1.50	89¢
Over 269,280	$1.14	34¢

Quarterly Service Charge for 2003				
Meter Size	Regular Rate	*Senior Rate	Meter Size	Regular Rate
5/8"	$15.75	$9.45	3"	$236.37
¾"	$23.64	$14.22	4"	$393.93
1"	$39.42	$23.64	6"	$787.86
1½"	$78.78	$47.31	8"	$1,260.87
2"	$126.06	$75.63	10"	$1,812.06
*Senior Rates not applicable for meters over 2"				

Drinking Water Standards

The SOC's listed below were tested for in our Finished Water in 2003, but were not detected. All MCL are in ppb

SOC	MCL	SOC	MCL	SOC	MCL
2,4-D	70	2,4,5-TP	10	ALACHLOR	2
ALDRIN	5	PCB 1016	0.5	ALDICARB	3
DCPA	200	PCB 1221	0.5	ATRAZINE	3
DICAMBA	50	PCB 1232	0.5	BUTACHLOR	50
DINOSEB	7	PCB 1242	0.5	CARBARYL	50
DIQUAT	20	PCB 1248	0.5	CHLORDANE	2
ENDRIN	2	PCB 1254	0.5	DALAPON	200
LINDANE	0.2	PCB 1260	0.5	DIELDRIN	5
OXAMYL	200	PCB 1262	0.5	ENDOTHALL	100
HEXACHLOROBENZENE			1	GLYPHOSATE	700
PENTACHLOROPHENOL			1	METHOMYL	50
ETHYLENE DIBROMIDE			.02	METRIBUZIN	50
HEPTACHLOR EPOXIDE			0.2	PICLORAM	500
ALDICARB SULFOXIDE			4	SIMAZINE	4
HEPTACHLOR			0.4	TOXAPHENE	3
3-HYDROXYCARBOFURAN					50
ALDICARB SULFONE					2
BENZO(A)PYRENE					0.2
CARBOFURAN					40
DI(2-ETHYLHEXYL)ADIPATE					400
DI(2-ETHYLHEXYL)PHTHALATE					6
DIBROMOCHLOROPROPANE					0.2
HEXACHLOROCYCLOPENTADIENE					50
METHOXYCHLOR					40
METOLACHLOR					50
PROPACHLOR					50



Drinking Water Standards

Other Volatile Organic Compounds listed below were tested for in 2003 in our Finished Water, but were not detected.	
DIOXIN	1-CHLOROBUTANE
ACETONE	2-NITROPROPANE
2-BUTANONE	ALLYL CHLORIDE
2-HEXANONE	METHYLACRYLATE
NITROBENZENE	HEXACHLORETHANE
ACRYLONITRILE	TETRAHYDROFURAN
DIETHYL ETHER	CARBON DISULFIDE
METHYL IODIDE	PENTACHLOROETHANE
PROPIONITRILE	CHLOROACETONITRILE
ETHYL METHACRYLATE	
METHYL METHACRYLATE	
METHYLACRYLONITRILE	
4-METHYL-2-PENTANONE	
1,1-DICHLOROPROPANONE	
1,2,3-TRICHOROBENZENE	
1,2,3-TRICHOROPROPANE	
tert-AMYL METHYL ETHER	
tert-BUTYL ETHYL ETHER	
trans-1,3-DICHLOROPROPENE	
trans-1,4-DICHLORO-2-BUTENE	

TheVolatile Organic Compounds listed below were tested for in 2003 in our Finished Water, all MCL are 50 PPB	
VOC	Range
BROMOFORM	0 - 0.5
BROMODICHLOROMETHANE	4.6 - 13
CHLOROFORM	2.1 - 6 .3
DIBROMOCHLOROMETHANE	3.7 - 23

Facts About Crypytosporidium

Cryptosporidium is a parasite that lives and multiplies in the intestines of warm-blooded animals. Its eggs are shed through feces, where they can enter lakes, reservoirs and other sources of drinking water. When exposed to adverse conditions, these eggs can form a spore so rugged that they become impervious to even concentrated bleach.

Once the spore is ingested, an intestinal illness called *Cryptosporidiosis* may result. The incubation period may range from 1 - 12 days. *Cryptosporidium* can be spread by person-to-person, or animal-to person contact, and by drinking contaminated water.

Human *Cryptosporidiosis* was first reported in 1976. The primary symptom is acute diarrhea. Other symptoms include abdominal pain, vomiting, headache, loss of appetite and a low-grade fever.

Some persons infected with *Cryptosporidium* will not become ill, but others may be especially susceptible to *Cryptosporidiosis*. In most individuals with normal immune systems, symptoms generally persist for two weeks or less. But immunocompromised persons, including individuals receiving chemotherapy and kidney dialysis patients, persons on steroid therapy, and those with Crohn's disease or HIV/AIDS, may have severe and long-lasting illness.

Properly operated water treatment procedures are effective in providing a barrier to *Cryptosporidium* and other pathogenic microorganisms from reaching the distribution system. Due to their high resistivity to chlorine, normal disinfection methods are ineffective against these parasites. Proper filtration of these small tough organisms, including the coagulation and sedimentation processes, is the most important vehicle in their control and elimination.

Cryptosporidium is spread through contact with fecal matter. One can minimize the risk of acquiring and spreading this parasite by cleansing hands after fecal contacts such as after toilet use, diaper changing and picking up pet waste. Since cattle are a common source, avoid drinking raw milk, and cleanse hands after contact with any farm animals. Avoid drinking unfiltered water, and comply with any water advisory issued by local and state authorities. If uncertain about the quality of a water supply, exposing water to a rolling boil for at least one minute will kill *Cryptosporidium*.

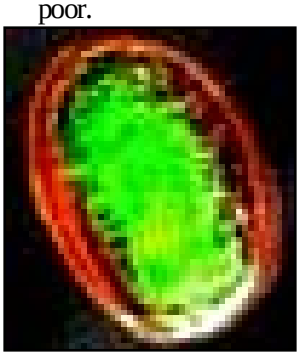
Bottled water, unless distilled or certified for cyst removal may contain *Cryptosporidium*. Current standards for bottled water do not guarantee that it be *Cryptosporidium*-free.

If home water filters are used, filters should have a pore size of less than 2 microns. Home filters should be certified for cyst removal by the National Sanitation Foundation (NSF; Standard #53).

Facts About Giardia

Giardia is a microbial pathogen present in varying concentrations in many surface waters and ground water under the influence of surface water. It is removed/inactivated through a combination of filtration and disinfection or by disinfection. From 7/97 – 12/98, as part of the Information Collection Rule, 18 monthly samples were collected and analyzed for *Giardia* cysts in our source water. 3 samples were presumed positive for *Giardia*, but none were confirmed. Therefore, our monitoring indicated the presence of *Giardia* in our source water. It was tested for on 11/95 in the treated water that goes to your tap and was not found.

Ingestion of *Giardia* may cause giardiasis, an intestinal illness. People exposed to *Giardia* may experience mild or severe diarrhea, or in some instances no symptoms at all. Fever is rarely present. Occasionally, some individuals will have chronic diarrhea over several weeks, with significant weight loss. Giardiasis can be treated with anti-parasitic medication. Individuals with weakened immune systems should consult with their health care provider about what steps would best reduce their risks of becoming infected. Anyone who thinks they may have been exposed to Giardiasis should contact their health care provider immediately. The *Giardia* parasite is passed in the feces of an infected person or animal and may contaminate water or food. Person to person transmission may also occur in day care centers or other settings where hand washing practices are poor.



Microscopic view of giardia

Giardia invading human intestines

Drinking Water Standards

The EPA Regulated Volatile Organic Compounds listed below were tested for in 2003 in our Finished Water, but were not detected.
1,1,1-TRICHLOROETHANE
1,1,2-TRICHLOROETHANE
1,1-DICHLOROETHYLENE
1,2,4-TRICHLOROBENZENE
1,2-DIBROM0-3-CHLOROPROPANE
1,2-DIBROMOMETHANE
1,2-DICHLOROBENZENE (ORTHO)
1,2-DICHLOROETHANE
1,2-DICHLOROPROPANE
1,4-DICHLOROBENZENE (PARA)
BENZENE
CARBON TETRACHLORIDE
CHLOROBENZENE (MONO)
cis-1,2-DICHLOROETHYLENE
DICHLOROMETHANE
ETHYLBENZENE
STYRENE
TETRACHLOROETHYLENE
TOLUENE
trans-1,2-DICHLOROETHYLENE
TRICHLOROETHYLENE
VINYL CHLORIDE
XYLENES

Drinking Water Standards

ENTRY POINT PARAMETERS	MCL	AVG	UNITS	RANGE	# OF TESTS
pH	n/a	7.6	SU	7.4 - 7.9	1334
ALKALINITY	n/a	88	PPM	74.2 - 94.9	24
CALCIUM HARDNESS	n/a	84.8	PPM	82 - 88	24
FREE CHLORINE	4.0	1.03	PPM	.68 - 1.29	2432
TOTAL CHLORINE	n/a	1.26	PPM	0.9 - 1.68	1328
FLUORIDE	2.2	0.85	PPM	.06 - 1.3	2245
TOTAL DISSOLVED SOLIDS	n/a	166	PPM	145 - 178	20
TOTAL SOLIDS	n/a	183	PPM	140 - 222	20
TURBIDITY	TT<0.5	0.11	NTU	.03 - .22	2442
COLIFORM	<1	ND	count/ml	n/a	196
HETEROTROPHIC BACTERIA	<500	1	count/100ml	0 - 16	102

2003 ENTRY POINT RESULTS				
INORGANICS	MCL	RESULTS	UNIT	DATE
ARSENIC	50	1.1	ppb	4/14/03
NICKEL	100	2.4		4/14/03
SELENIUM	50	1.4		4/14/03
BARIUM	2	0.023	ppm	4/14/03
NITRATE-N	10	0.3		4/14/03
SODIUM	n/a	10.0		4/14/03
SULFATE	250	21.0		4/14/03
ZINC	n/a	0.02		4/14/03

THESE INORGANICS WERE TESTED FOR BUT NOT FOUND IN OUR FINISHED WATER IN 2003		
IRON	ANTIMONY	BERYLLIUM
SILVER	CADMIUM	CHROMIUM
MERCURY	THALLIUM	MANGANESE
CYANIDE		NITRITE-N

Aesthetic Qualities

Taste and odor is one component of drinking water's aesthetic quality. The Water Authority in recent years has been experiencing some of the worst episodes of summer taste and odor in its 70-year history. Although water sometimes has a taste and odor, it is 100% safe to drink.

Decaying vegetation and byproducts of microbia are probably the most universal sources of taste and odor problems in surface water. The organisms most often linked to taste and odor problems are the filamentous bacteria *actinomycetes* and the blue-green algae.

Two highly studied by-products of *actinomycetes* and the blue-green algae are geosmin and methylisborneol (MIB). These compounds are responsible for the common earthy-musty odors in water supplies and have been isolated from many genera of *actinomycetes* and the blue-green algae. Both geosmin and MIB can have odor threshold concentrations of less than 10 parts per trillion.

Taste & Odor Algae

Zebra Mussels

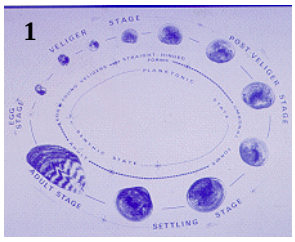
The zebra mussel is a small freshwater shellfish native to the Black & Caspian seas of western Russia. They were introduced into European waters in the 18th Century. By 1986 the mollusks were transported to North America from freshwater European ports, through the discharge of ballast tanks from international shippers.

They are prolific breeders. Each female can produce up to 40,000 eggs each year. Using elastic-like fibers they can attach to any hard surface and quickly colonize large areas, reaching densities of more than 100,000 per square meter. They feed by filtering water containing microorganisms through their gill system.

Once the zebra mussels invaded Lake Erie they spread like wildfire. Their impact on Lake Erie has been profound. Nearly all particulate matter is strained from the lake's water. Uneaten suspended matter is bound with mucous and amassed among the shells in its immense colonies. Because of this filtering activity, the clarity of Lake Erie has greatly improved, allowing light to penetrate much deeper, and with much greater intensity than ever before.

Unfortunately this phenomenon has serious consequences to the lake's ecosystem and water quality. Besides severely affecting the aquatic food chain, this increase in light intensity causes the foul summertime taste and odor problem. The additional light entering the lake causes a steep acceleration in the blue-green algae growing cycle, the main source of taste and odor problems.

1



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3

(1) Life cycle of the zebra mussel; (2) Zebra mussel close-up; (3) beach wash-up of zebra mussels

Drinking Water Standards

The Safe Drinking Water Act (SDWA) was passed in 1974 because of congressional concerns about organic contaminants in drinking water and uneven state supervision of public drinking water supplies. Last year we conducted over 15000 tests for over 80 drinking water contaminants. No contaminants detected were in violation of a Maximum Contaminant Level (MCL), a Treatment Technique (TT), or exceeding an Action Level. (AL).

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).

SOURCE WATER PARAMETERS FOR 2003				
PARAMETER	UNITS	AVG.	RANGE	# OF TESTS
pH	SU	8.1	7.8 - 8.5	1375
ALKALINITY	PPM	100	94 - 104	24
CALCIUM HARDNESS	PPM	94	90 - 100	24
FLUORIDE	PPM	0.01	0 - .11	216
TOTAL DISSOLVED SOLIDS	PPM	176	160 - 201	24
TOTAL SOLIDS	PPM	180	148 - 202	24
TURBIDITY	NTU	4.2	0.45 - 110	2545
COLIFORM	count/ ml	63	0 - 1000	210
HETEROTROPHIC BACTERIA	count/ 100ml	15	0 - 1000	115