

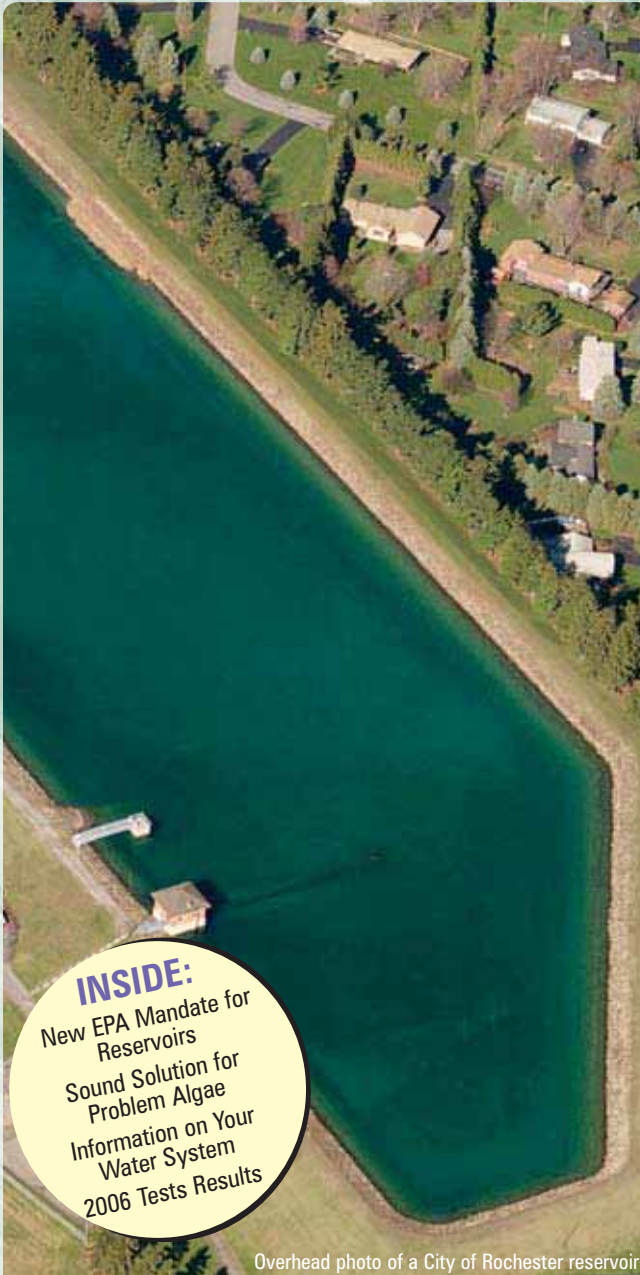


City of Rochester, New York

Department of Environmental Services
Bureau of Water

2006 WATER QUALITY REPORT

131 Years of Pure and Wholesome Drinking Water



INSIDE:

New EPA Mandate for
Reservoirs

Sound Solution for
Problem Algae

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2006 Tests Results

Overhead photo of a City of Rochester reservoir

Water Supply ID # NY2704518

EPA ISSUES MANDATE THAT AFFECTS ROCHESTER RESERVOIRS

In December of 2005, the EPA enacted a regulation that impacts Rochester's three uncovered drinking water reservoirs: Cobb's Hill Reservoir, Highland Reservoir and Rush Reservoir. The regulation, commonly known as the LT2 Rule (www.epa.gov/safewater/disinfection/lt2/index.html), forces the City to take one of three actions at each reservoir: **1)** install a cover or water tank; **2)** employ additional treatment at the outlet of each reservoir; or **3)** abandon the reservoir.

The LT2 Rule increases protection against microbes that can cause waterborne disease outbreaks. The EPA based the LT2 Rule on scientific studies that showed uncovered reservoirs are subject to microbial contamination from bird and animal wastes, human activity, and airborne deposits. Of particular concern to the EPA is the protozoan *Cryptosporidium*, an organism difficult to kill with chlorine disinfection. The LT2 Rule is a nationwide mandate, and not specifically targeted at Rochester.

There has never been a known disease problem associated with Rochester's uncovered reservoirs, but there have been incidents that highlight EPA's concerns with uncovered reservoirs. A recent example was the September boil water advisory issued for neighbors of Cobb's Hill reservoir after a routine water test found the bacteria *E. coli* present in the water leaving the reservoir (See Test Results for more information). The bacteria most likely originated in the droppings of seagulls that tend to gather at the reservoir.

City staff have been working with a consultant to evaluate alternatives and select the best approach to comply with the LT2 Rule.

The LT2 Rule requirements may result in some visible changes at the city reservoirs. Residents can be assured that their input into the reservoir issue will be solicited in a variety of ways. Among them, you will be able to follow the progress of the study and offer comments at www.cityofrochester.gov.

SOUND SOLUTION FOR PROBLEM ALGAE

Last summer, City staff completed a successful test at Cobb's Hill

reservoir using an innovative device that employs ultrasonic sound waves to control algae. Six of the ultrasound units were suspended off the perimeter of the 144 million gallon reservoir. Subsequent testing found a significant reduction in algae when compared to previous years. The devices allowed a dramatic reduction in the amount chemical (copper sulfate) used to control algae in that reservoir. The ultrasonic devices will be tested again this summer to verify results.

INFORMATION ON YOUR WATER SYSTEM

Where does my water come from?

Since 1876, Rochester residents

have relied upon Hemlock and Canadice Lakes for their drinking water supply. These lakes and surrounding 61 square miles of watershed are "upland" in the hills of Livingston and Ontario counties, about 30 miles south of Rochester. The City owns roughly 7000 acres of the watershed, including the lakes and their surrounding shorelines. It is this ownership that helps us protect the lakes from potential sources of contamination.

Working Together to Protect



The City of Rochester Water Bureau's Hemlock Filtration Plant has received a 2007 national award from the Partnership for Safe Water. The Hemlock Water Treatment Plant has maintained the Award for five years.

The City supplements its water supply with Lake Ontario water purchased from (MCWA). This water is treated at the MCWA's Shoremont Treatment Plant located in Greece (www.MCWA.com).

How is my water treated?

The Hemlock and Shoremont treatment plants both employ similar treatment processes involving coagulation, filtration, and disinfection. During coagulation, chemicals are added to untreated water, causing particles like algae, bacteria, and silt in the water to clump together into larger particles called floc. The floc particles are then filtered out by passing the water through layered beds of granular media.

The filtered water is disinfected through the addition of chlorine, and fluoride is added to help prevent tooth decay. The water may also be seasonally adjusted for pH.

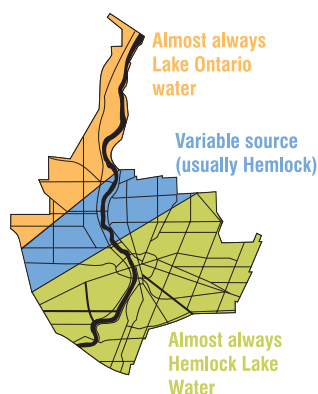
What happens to the water after treatment?

Water treated at the Hemlock Filtration Plant flows to the city by gravity through three, large 100 year-old pipelines. Along the way, some water is sold wholesale to water districts in the towns/villages of Livonia, Lima, North Bloomfield, and Richmond. It is also sold to the MCWA, who in turn supply it to several Monroe County communities. A large volume of treated water is stored in the three aforementioned uncovered reservoirs, with the water being re-disinfected with chlorine as it exits each

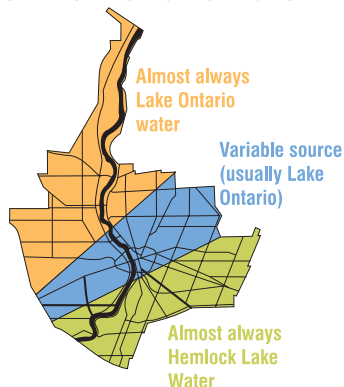
reservoir. From the three reservoirs, water enters a complex grid (over 500 miles) of water mains that distribute the water to city homes and businesses.

Lake Ontario water is pumped into the city distribution system primarily in the area of Mt. Read Blvd. and West Ridge Rd. The volume of purchase varies from 0 to 30 million gallons per day (MGD), depending on the season. This variability means that some areas of the City may receive either Hemlock or Lake Ontario water, or a mixture of both, depending on the season and the prevailing pattern of demand. The accompanying maps illustrate the typical distribution patterns of the two sources of water during summer and winter conditions.

Winter Distribution Pattern



Summer Distribution Pattern



What types of water system improvements were completed or initiated in 2006?

The Water Bureau completed construction of its new \$12 million Operations Center at its former headquarters site at 10 Felix St. This new facility houses administrative and operations offices, as well as a garage for the Bureau's fleet. It was constructed following strict guidelines for environmental friendliness, and will be the City's first building to be awarded a special green-building certification by the U.S. Green Building Council.

Water system improvements included replacement of 2.7 mile segment of the 130 year-old pipeline that conveys water from Hemlock Lake to Rochester. Another 26 mile segment of the old transmission pipe was subjected to a system that uses electrodes and electrical currents to suppress corrosion on the exterior of the pipe. Pipe improvements within the City distribution system included cleaning and cement lining over five miles of aging cast-iron water mains.

Are there any new major capital improvement projects on the horizon?

The water system is continually being updated and improved. The Water Bureau's capital investment plan calls for more than \$7 million of investments over the next fiscal year, and about \$57 million over the next five years. These sums include pipe replacements and improvements, treatment plant updates, reservoir modifications, vehicle replacements, and more. The largest capital project on the horizon will be the reservoir improvements necessary to meet the EPA's LT2 Rule, as described in the introduction to this report.

How can I save money on water?

Simple changes in your daily routine can save you money on your water bill and also the environment. Here are some tips:

- Turn off the faucet while shaving, washing up, brushing teeth, and washing dishes.
- Fix dripping and leaking faucets and toilets.
- Throw used facial tissues into the waste basket instead flushing down the toilet.
- Mulch around shrubs and garden plants to save on watering needs.
- Wash cars less frequently.

INTERESTING WATER SYSTEM FACTS

Statistics	2006
Average Daily Production (MG)	36.9
Average Daily City Consumption (MG)	22.9
Average Daily Wholesale Sales (MG)	18.9
Average Daily Wholesale Purchase (MG)	11.0
Average Daily Lost Water (MG)	6.1
Cost (\$/1,000 gals for 1st 20,000 gals)	\$2.63
Population Served	219,000
Number of Retail Accounts	60,166

Table Notes:

Lost water is that portion of water put into the system that cannot be accounted for by metered sales or other permitted uses. MG=Millions of gallons

More conservation tips can be found on this internet site: <http://www.dec.state.ny.us/website/dow/whatdo.html>.

Another money saving tip: drink tap water (at 1 penny for 3.5 gals) instead of bottled water (\$1 to \$4 a gallon). If you find the chlorine flavor objectionable, keep a fresh glass bottle of tap water in your refrigerator.

Can I visit the watershed or tour the water plant?

Thousands of people visit the watershed each year and enjoy activities such as hiking, fishing, hunting, boating, and bird watching. Visitors are required to obtain a free permit that describes usage rules. The permit is available at the self-serve permit station located on Rix Hill Road just off Hwy 15A in Hemlock, or download from www.cityofrochester.gov/des/index.cfm?id=319.

Tours of the Hemlock Water Filtration Plant are available by appointment and can be scheduled by calling **428-6680**.

Should I be concerned about chemical contaminants in my water?

We have found no chemical contaminants in our water at levels that raise concern. Please understand that all drinking water, including bottled water, con-

tains at least small amounts of impurities. The mere presence of a chemical does not mean there is a health risk, and in fact, some substances such as chlorine and fluoride are added to the water supply for health reasons. More information about contaminants and potential health effects can be obtained by calling the EPA Safe Drinking Water Hotline at **1-800-426-4791**.

How do contaminants get into the water?

The sources of drinking water (both tap and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and underground aquifers. As water travels over the surface of the land or through the ground, it dissolves naturally-occurring minerals, and in some cases, radioactive material. It can also pick up contaminants that result from the presence of animals and from human activities. These contaminants may include: microbial and inorganic contaminants; pesticides and herbicides; organic chemical contaminants; and, radioactive substances.

Are there any particular concerns regarding pollution in the watershed?

The City's ownership and control of a large amount of property surrounding the lakes, coupled with its routine surveillance and testing programs, helps assure on-going protection of this precious resource. Testing confirms that our lakes' quality remains high.

Who is in charge of regulating the quality of drinking water?

The New York State Department of Health (NYSDOH) and the EPA both prescribe regulations that limit the amounts of contaminants that can be present in public drinking water, as well as in bottled water. They dictate how we monitor, test, and report data. The State and the FDA's regulations establish limits for contaminants in bottled water which must provide the same protection for public health. The Monroe County Department of Public Health (contact at 753-5057) helps enforce these regulations. You can find detailed information about the State's water supply program at www.health.state.ny.us/nysdoh/water/main.htm and about the EPA program at www.epa.gov/ogwdw/

TEST RESULTS FOR 2006

What kinds of testing was performed on our drinking water, and how well did Rochester comply with the health department standards for water quality?

Your water was tested for more than 130 types of regulated biologic agent and chemical compounds in 2006. Samples were collected from all stages of the system, including the source (streams and lakes), various steps in the treatment process, the storage reservoirs, and from the customers' taps. All but one test showed the water quality to be superior to government standards.

The following two paragraphs address a legal requirement to describe the Sept. 15 violation of the *E.coli* standard. Much of the language in the second paragraph is specifically required by regulation.

On September 15, 2006, a sample of water leaving Cobb's Hill reservoir tested positive for the fecal bacteria, *E.coli*. This positive test resulted in an acute violation of the Total Coliform Rule, and as such, resulted in a two-day boil water advisory for the nearby neighborhood. The affected water mains were flushed, and the reservoir was taken off-line while follow up testing ensued.

While the precise source of the *E.coli* bacteria remains unknown, it is believed likely to have originated in the droppings of seagulls and ducks that frequent the reservoir. Wastes from humans and animals are also a potential source of *E.coli*. Consumption of water contaminated with *E.coli* can cause short-term effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a special health risk for infants, young children, and people with severely-compromised immune systems.

Were the protozoans *Cryptosporidium* or *Giardia* found in our water?

No. September of 2005 marked the end of an EPA mandated, two-year monitoring program that tested for *Cryptosporidium* and *Giardia*, and none of the monthly Hemlock Lake samples collected tested positive for these microbes. These results are a testament to the pristine character of the lakes' watersheds and underscore the need for continued watershed protection.

Nonetheless, if your immune system is severely compromised (infants, infirm elderly, persons undergoing chemotherapy, persons who have undergone organ transplants, and people with HIV/AIDS or other immune disorders), you are at higher risk of disease, and should seek advice from your health care provider regarding drinking water. You can get more information about these and other pathogens by calling the EPA Safe Drinking Water Hotline at **1-800-426-4791**, or by logging onto:

www.cdc.gov/ncidod/dpd/parasites/cryptosporidiosis/default.htm

Is there lead in my drinking water?

At-the-tap lead levels in the vast majority of Rochester households remain well within allowable limits, but the amount of lead present does vary by the age and types of plumbing materials found in individual households. Infants and young children are typically more vulnerable to the effects of lead than the general population. If you are concerned about elevated lead levels in water, call us at 428-6477. You can minimize your lead intake from water by simply allowing the tap to run for one or two minutes before use. For more information about lead in drinking water, call the Safe Drinking Water hotline at **1-800-426-4791**, or log onto: www.epa.gov/safewater/lead/index.html

Do I need a water softener, or any other type of in-home treatment unit?

City water customers need not consider any type of in-home water treatment unit unless they have a special need. The hardness level of city water is generally considered to be low enough to not require softening. Softeners and other in-home treatment units can be effective, but they can also be expensive to install and maintain. If not maintained to manufacturer's recommendations, some can actually degrade water quality. If you are thinking about an in-home treatment unit, be sure to first check out the recommendations of the National Sanitation Foundation at: www.nsf.com/consumer/drinking_water/dw_treatment.asp?program=WaterTre

How can I find out more about fees and water service related issues?

You may contact a customer service representative (24 hr) at **428-5990**. If the representative cannot answer your question directly, they will put you in

touch with someone who can. You can also find more information about Bureau services, fees, and contacts at: www.cityofrochester.gov/des/index.cfm?id=536

The following contaminants were tested for but not detected in 2005:

1,1,1,2-Tetrachloroethane, 1,1,1-Trichloroethane, 1,1,2,2-Tetrachloroethane, 1,1,2-Trichloroethane, 1,1-Dichloroethene, 1,1-Dichloropropene, EDB, 1,2,3-Trichlorobenzene, 1,2,3-Trichloropropane, 1,2,4-Trichlorobenzene, 1,2,4-Trimethylbenzene, 1,2-Dichlorobenzene, 1,2-Dichloroethane, 1,2-Dichloropropane, 1,3,5-Trimethylbenzene, 1,3-Dichlorobenzene, 1,3-Dichloropropane, 1,3-Dichloropropene (Cis), 1,3-Dichloropropene (Trans), 1,4-Dichlorobenzene, 2,2-Dichloropropane, 2,4 D, 2,4-5 TP, 2-Chlorotoluene, 3-Hydroxycarbofuran, 4,4-DDT, 4-Chlorotoluene, Aldicarb Sulfone, Aldicarb Sulfoxide, Aldrin, Antimony, Arsenic, Asbestos, Atrazine, Benzene, Benzo(a)pyrene, Beryllium, Bis (2-Ethylhexyl) Phthalate, Bromobenzene, Bromochloromethane, Bromomethane, Butachlor, Cadmium, Carbaryl, Carbofuran, Carbon Tetrachloride, Chlordane, Chlorobenzene, Chloroethane, Chloromethane, cis-1,2-Dichloroethene, Cryptosporidium, Cyanide, DCPA, Dalapon, DBCP, Di (2-Ethylhexyl) Adipate, Dibromomethane, Dicamba, Dichlorodifluoromethane, Dichloromethane (Methylene Chloride), Dieldrin, Dinoseb, Dioxin, Diquat, Endothall, Endrin, Ethylbenzene, Glyphosate, Gross Alpha, Giardia, Gross Beta, Heptachlor, Heptachlorepoxyde, Hexachlorobenzene, Hexachlorobutadiene, Hexachlorocyclopentadiene, Isopropyl Benzene, Lindane, Manganese, Mercury, Methomyl, Methoxychlor, Metolachlor, Metribuzin, Mirex, MTBE, n-Butylbenzene, Nickel, Nitrite, n-Propylbenzene, Oxamyl, PCB's, Pentachlorophenol, Pichloram, p-Isopropyltoluene, Propachlor, Propylene glycol, sec-Butylbenzene, Selenium, Silver, Simazine, Styrene, Surfactants, tert-Butylbenzene, Tetrachloroethene, Thallium, Toluene, Toxaphene, trans-1,2-Dichloroethene, Trichloroethene, Trichlorofluoromethane, Vinyl Chloride, Xylene, Zinc.

A complete list of results for all substances tested in 2006 is available at www.cityofrochester.gov (search for *water quality*), or by calling 428-6680.

DEFINITIONS OF TERMS

The following definitions apply to water quality terms used in this brochure.

µg/L Micrograms per liter— same as parts per billion (ppb); corresponds to one dollar in a billion dollars

AL Action Level— the concentration of a contaminant which, if exceeded, triggers treatment or other requirements a water system must follow. For example, special treatment requirements kick-in if lead levels are not below 15 µg/L at 90% or more of sites tested

ALG Action Limit Goal— the level of a contaminant in water below which there is no known or expected health risk, with allowance for a margin of safety

aquifers— underground source of water

at-the-tap— distribution system sampling location(s) such as a customer's household tap

cyst (protozoan)— an inactive life stage wherein the organism forms a protective sac that allows it to survive harsh environments

DS Distribution System

Entry point— first point where water enters the distribution system following treatment. Identified for regulatory compliance purposes

L Liter— volume of water slightly larger than a quart

MCL Maximum Contaminant Level— the highest level of a contaminant allowed in drinking water. MCLs are set as close to the MCLGs as feasible

MCLG Maximum Contaminant Level Goal— the level of a contaminant in drinking water below which there is no known or expected health risk, with allowance for a margin of safety

MRDL Maximum Residual Disinfectant Level— The highest level of a disinfectant allowed in drinking water. 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 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 contamination

mg/L Milligrams per liter— same as parts per million (ppm); corresponds to one dollar in one million dollars

NA Not Applicable

ND Not Detected— laboratory analysis indicates that the constituent is not present

NS No Standard— no regulatory standard (MCL or MCLG) in effect

NTU Nephelometric Turbidity Unit— a measure of the clarity of water. Turbidity in excess of 5 NTU is just noticeable to the average person

pCi/L Picocuries per liter— a measure of the radio-activity of water

RAW—untreated water

TT Treatment Technique— a required process intended to reduce the level of a contaminant in drinking water

WTP Water treatment plant

ALL SUBSTANCES WERE WITHIN ALLOWABLE LIMITS.

INORGANIC SUBSTANCES

The following substances were detected in water collected at the treatment plant and/or from the water distribution system (customer tap). Not all of these substances are harmful, and in fact,

some are purposely added during the treatment process for their health benefits. The substances that are regulated because of health concerns are printed in bold.

SUBSTANCE	UNITS	MCLG	MCL	HEMLOCK AVERAGE (RANGE)	ONTARIO AVERAGE (RANGE)	TESTED AT	LIKELY SOURCE	MEETS EPA STAND.
Barium	mg/L	2	2	0.015	0.021 (0.019-0.022)	WTP	Erosion of natural deposits	YES
Chlorine (entry point)	mg/L	NS	4	0.95 (0.5-1.2)	1.1 (0.8-1.5)	WTP	Disinfectant additive	YES
Chlorine (at-the-tap)	mg/L	NS	NS	0.7 (ND-1.4)	0.7 (ND-1.7)	DS	Disinfectant additive	NA
Fluoride	mg/L	NS	2.2	0.87 (ND-1.03)	.95 (0.11-1.4)	WTP	Water treatment additive to promote dental health	YES
Nitrate	mg/L	10	10	0.18 (0.05-0.26)	0.32 (0.25-0.42)	WTP	Fertilizers; erosion of natural deposits; septic tank leachate	YES
Chloride	mg/L	NS	250	32 (30-34)	23 (19-24)	WTP	Natural deposits; road salt	YES
Hardness (as CaCO ₃)	mg/L grains	NS	NS	86 5	125 7	WTP	Erosion of natural mineral deposits	NA
Sodium	mg/L	NS	NS	18	12 11-13	WTP	Natural deposits; road salt; water treatment chemical component	NA
Sulfate	mg/L	NS	250	17 (16-21)	28	WTP	Natural deposits	YES

ORGANIC COMPOUNDS

Organic, or carbon containing compounds, can be simple or very complex in form. There are many natural organic compounds and man-made (synthetic) organics such as pesticides, solvents, and petroleum products. Levels of most synthetic organic substances in Rochester's drinking water are too low to measure, but several

organic compounds known as disinfection byproducts (DBP's) are commonly found at low levels. DBP's form when natural organic substances react with the chlorine added during water treatment. Health regulations limit the levels of the most common DBP compounds. Organic contaminants that were tested for but not found are listed elsewhere on these pages.

SUBSTANCE	UNITS	MCLG	MCL	HEMLOCK AVERAGE (RANGE)	ONTARIO AVERAGE (RANGE)	LIKELY SOURCE	MEETS EPA STAND.
Total Trihalomethane	µg/L	NS	80	39 (14-51)	41 (12-81)	Byproduct of water chlorination	YES
Haloacetic acids	µg/L	NS	60	25 (6-39)	15 (6-40)	Byproduct of water chlorination	YES
Total Organic Halides	µg/L	NS	NS	34 (22-44)	101 (54-158)	Byproduct of water chlorination	NA

TURBIDITY

This is a measure of the clarity of water and helps us judge the effectiveness of water filtration. Regulatory compliance is based

on "entry point" samples taken at the water treatment plant and on samples collected from the distribution system.

SUBSTANCE	UNITS	REGULATORY LIMIT	HEMLOCK PLANT			SHOREMONT PLANT		LIKELY SOURCE	MEETS EPA STAND.
			AVERAGE (MAX)	COMPLIANCE W/STANDARD		AVERAGE (MAX)	COMPLIANCE W/STANDARD		
Turbidity (entry point)	NTU	TT=95% of samples must be <0.3 NTU	0.07 (0.20)	100%		0.07 (0.12)	100%	Erosion of soils through runoff, algae	YES
Turbidity (at-the-tap)	NTU	Avg. <5 NTU for month	0.2 (0.04-7.1)	NA		0.15 (0.05-5.7)	NA	Algae, corrosion of pipes	YES

BACTERIA AND PROTOZOA

Total Coliform is a group of bacteria used to indicate the general sanitary conditions in a water system. Most species of this group do not present a health concern, but one species, *E. coli*, can be pathogenic. In 1993, the State Health Department granted the City a "biofilm variance," or exception to the Total Coliform MCL. Biofilm is a layer of bacteria that can be found on almost all surfaces,

including the inside walls of water pipes. A biofilm variance is only granted where it is shown through testing that the species of coliform bacteria recovered from the water system are harmless. The variance does not apply to *E. coli*, *Giardia* and *Cryptosporidium* are chlorine-resistant protozoans that can cause intestinal disease.

ORGANISM	UNITS	MCLG	MCL		HEMLOCK HIGHEST PRESENCE (AVG. PRESENCE)	ONTARIO HIGHEST PRESENCE (AVG. PRESENCE)	TESTED AT	LIKELY SOURCE	MEETS EPA STAND.
Total Coliform bacteria	% monthly presence	0	Violation if present in more than 5% of monthly samples		2.8% (0.7%)	NA	DS	Naturally present in soils and in wastes of warm blooded animals	YES
<i>E. coli</i> bacteria	presence	0	Violation upon any confirmed presence		Present	NA	DS	Wastes of warm blooded animals and humans	NO
<i>Cryptosporidium</i> sp.	#/10 L	NS	NS		ND	ND	WTP Raw	Wastes of infected animals and humans	NA
<i>Giardia</i> sp.	#/10 L	NS	NS		ND	ND	WTP Raw	Wastes of infected animals and humans	NA

COPPER AND LEAD

See discussion elsewhere in report. Lead testing in 2006 (data in table) was performed for regulatory compliance purposes.

SUBSTANCE	UNITS	REGULATORY GOAL (ALG)	REGULATORY LIMIT (AL)		DISTRIBUTION HOUSEHOLDS		LIKELY SOURCE	MEETS EPA STANDARD
					90TH PERCENTILE RANGE	% OF SAMPLES ABOVE AL		
Copper	ug/L	1300	1300		98 (4.3-220)	0	Corrosion of pipes & plumbing fixtures	YES
Lead	ug/L	0	15		9.1 (ND-24)	6%	Corrosion of pipes & plumbing fixtures	YES



City of Rochester, New York
Hemlock Filtration Plant
7412 Rix Hill Rd.
Hemlock, NY 14466

