Chloramination and Disinfection – The Facts

With our increased understanding of chlorine use and its drawbacks, drinking water and public health scientists have determined that a less powerful form of chlorine, called chloramines, is a better overall solution for public health. Disinfecting the water, while minimizing the by-products formed, is the overall goal of the new EPA regulations.

Manchester Water Works is preparing to convert your water system to chloramines before summer. The conversion will be of significant interest to **dialysis patients and owners of tropical fish**. Otherwise, the conversion should result in reduced chlorine tastes and odors and overall safer water.

Chloramine Q&A

Q: What is chloramine?

A: Chloramine is a disinfectant used to protect water systems that is produced by combining chlorine and ammonia.

Q: Why is MWW changing from chlorine to chloramine disinfection?

A: The primary reason is to reduce the formation of a specific group of by-products when organic matter comes in contact with chlorine, namely, trihalomethanes (THMs). THMs at high concentrations over a lifetime may statistically increase the chance of some cancers. Even with an aging facility, Manchester Water Works has always been able to meet the standard for disinfection by-products. However, with a reduction in the standard from 100 parts per billion ppb to 80 in 2004 and further restrictions under consideration by USEPA, Manchester Water Works changed to Chloramination that effectively controls the formation of THMs.

For more information about Chloramines or the Water Treatment Plant, contact us at

624-6482

or visit our website:

www.manchesternh.gov/citygov/wtr/

This report contains a summary of your drinking water quality. The Safe Drinking Water Act (SDWA) requires that utilities issue an annual "Water Quality" report to customers in addition to other notices that may be required by law.

This report details where our water comes from, what it contains, and the risks our water testing and treatment are designed to prevent.

Le rapport contient information concernant la qualité de l´eau de votre communauté. Faites-le traduire, ou parlez-en à un ami qui le comprend bien.

El informe contiene información importante sobre la calidad del agua en su comunidad. Tradúzcalo o hable con alguien que lo entienda bien.

Manchester Water Works invites its customers to become involved with their water supplier. Your Board of Water Commissioners meets monthly at our offices. Please feel free to call us for information about dates and times. Additionally, you can find out more about Manchester Water Works on the internet at **www.manchesternh.gov/citygov/wtr/**

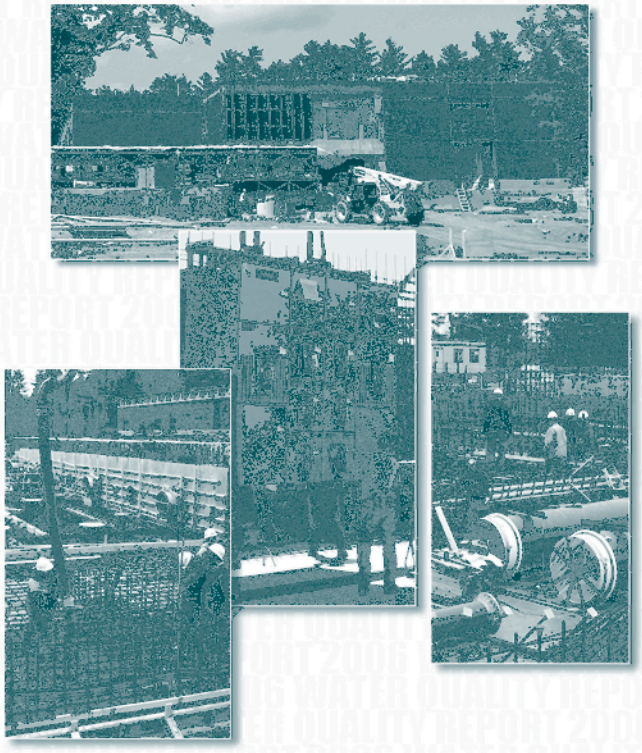
Manchester Water Works

281 Lincoln Street
Manchester, NH 03103
603-624-6494

Manchester Water Works

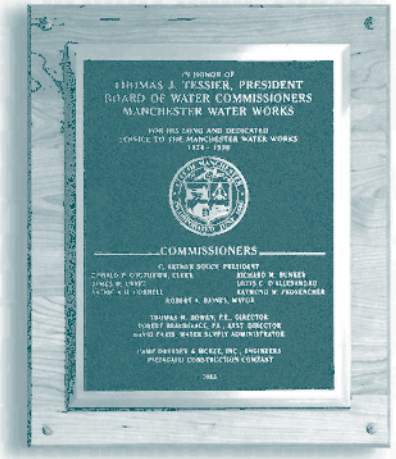
2006 Water Quality Report

A guide to understanding your drinking water and an update on your Water Treatment Plant renovations.



Treatment Plant Dedication

On November 17, 2005, the Manchester Water Works dedicated the new filter ozone facility located at the Water Treatment Plant on Lake Shore Road in Manchester in honor of Thomas J. Tessier, former President of the Board of Water Commissioners. The dedication was the culmination of nearly six years of effort by the Manchester Water Works, our consultant, Camp Dresser & McKee, and contractor, Pizzagalli Construction. We are pleased to report that the nearly $28 million project will be completed within budget. The improved water from the facility has been delivered to Manchester Water Works' nearly 165,000 customers, since August of 2005.



In the next several months, the contractor will be completing the final testing of the ozone disinfection system that will replace free chlorine as the plant's primary disinfectant. Ozone is a more robust disinfectant that will also reduce taste and odor issues for many of our customers, as well as assist the department in meeting new stricter standards for the formation of potentially harmful disinfection byproducts. The new technology at the Lake Massabesic Water Treatment Plant will insure that the department will be able to meet an ever-increasing number of federal drinking water standards, ultimately supplying a safer and better tasting product to our customers.

The Treatment Plant Upgrade We Can All Drink to That!

The Manchester Water Works upgrade of the Water Treatment Plant that supplies your tap water has been in progress for two years. The project not only repaired and replaced most of the old treatment plant equipment, but also instituted new purification processes to give you cleaner, safer, better tasting water.

Safer Drinking Water

The new plant reduces the use of chlorine at two stages in the treatment process and filters water more thoroughly. Chlorine has been used for over a century to disinfect drinking water and has saved countless lives from acute illness due to diseases, such as cholera and typhoid fever. Recently though, health experts suspect that chlorine may increase the risk of certain cancers. Ozone and chloramine are the solutions that we have adopted to reduce these risks.

Healthier Alternatives

Instead of using chlorine as our primary disinfectant during water purification, we will add ozone, a chemical produced on site by mixing oxygen and electricity. This application will disinfect and create optimal conditions for filtration, the process following purification. New, deep bed carbon filters designed to work with ozone have also been built. As the water is pumped to customers, chloramine disinfection will be the final step in the treatment process.

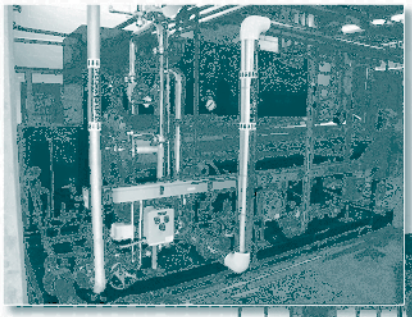
Cleaner Water

We have also added other improvements to help optimize corrosion control and assist in manganese removal, among others. (Manganese is a nuisance contaminant that forms black specs sometimes in toilets and dishwashers.)

Enjoy the improved water quality and feel free to call, if you have any additional questions or would like a tour of the new facility.

Operator studies new control system for real time information on Water Purification Process.

New Filters provide sound, reliable filtration of Lake Massabesic Waters.



Three Ozone Generators disinfect and purify water before it is filtered.

Intermediate Lift Pumps

New Addition includes over 50,000 square feet.

Health Information

To ensure that tap water is safe to drink, the EPA prescribes limits on the amount of certain contaminants in water provided by public water systems. FDA regulations establish limits for contaminants in bottled water.

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.

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 can dissolve many natural minerals and, especially in the case of ground water, radioactive material. Water is also subject to contaminants resulting from the presence of animals or human activity. The wide variety of contaminants that may be present in source water include:

A) Microbiological contaminants, such as viruses and bacteria originating from sewage, septic systems, agricultural livestock and wildlife;

B) Inorganic contaminants, such as road salt, metals, industrial or domestic wastewater discharge, oil and gas production, mining or farming;

C) Synthetic organic chemicals, such as petroleum products from gasoline and oils, or pesticides and herbicides and are present in runoff and as residues from household use;

D) Radioactive contaminants, either natural or man-made. Radon is one such natural, radioactive contaminant currently being regulated by the EPA. Manchester's water does not contain radon.

E) Lead – Infants and young children are typically more vulnerable to lead in drinking water than the general population. It is possible that lead levels at your home may be higher than at other homes in the community as a result of materials used in your home's plumbing. If you are concerned about elevated lead levels in your home's water, you may wish to have your water tested and flush your tap for 30 seconds to 2 minutes before using tap water. Additional information is available from the Safe Drinking Water Hotline (800-426-4791).

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised people, such as people with cancer undergoing chemotherapy, people who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk for infections. These people should seek advice about drinking water from their health provider. EPA/Center for Disease Control guidelines on appropriate means to lessen the risk of infection by Cryptosporidium are available from the Safe Drinking Water Hotline at **1-800-426-4791**.

Manchester Water Works Educational Outreach Program

3rd Grade Poster Contest

Winner
Britini Benoncourt
North West Elementary

1st Place

Water is a Precious Resource

4th Grade Science Fair

Elizabeth Conway
Webster School

Trevor Faulkner
Hallsville School

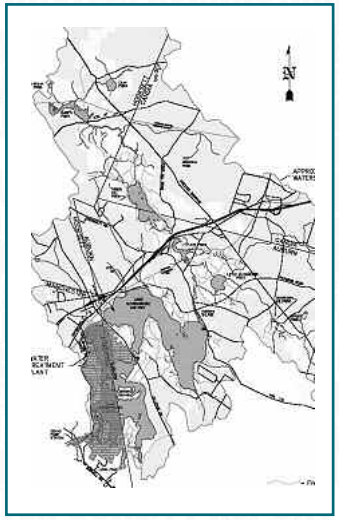
Lake Massabesic

Unspoiled. Undeveloped. Natural.

Cool summer breezes, the sound of gentle waves and perhaps a loon call in the distance… our water source.

Lake Massabessic, located in East Manchester and Auburn, has been the sole supply for our Manchester and out-of-town customers since around 1874. Unlike other lakes in Southern NH, Lake Massabesic retains its natural, pure quality. This is because most of the shore and surrounding lands were purchased by Manchester Water Works to protect the water supply from development. Lake Massabesic is actually the last in a series of water bodies that collect rain and precipitation that flow through streams into the lake. Tower Hill Pond, Little Massabesic Lake and Grant's Pond, all in Auburn, are some of the major impoundments. Clay Pond, Dubes Pond and Hinemen Pond in Hooksett are also important to the quality of water because they act to clarify and filter the water well before it spills into Lake Massabesic.

We are asking our watershed neighbors and our customers to respect their natural condition, take care with their use, and observe the Manchester Water Works rules and regulations established for their benefit. Each of us plays a vital role in preserving these natural treasures for our children and generations to come.



Lake Massabesic and Watershed

For more information regarding rules and regulations for watershed use, go to our web site at:

http://www.manchesternh.gov/citygov/wtr/
or visit the NH Department of Environmental Services website where a copy of their 2002 Source Water Assessment is available at:
http://www.des.state.nh.us/dwspp/reports/manchester.pdf

Water Quality Table

The table to the right provides information about those contaminants that were detected in Manchester's water in 2005. During the year, Manchester had multiple analyses run by the New Hampshire Department of Environmental Services for well over 100 individual contaminants. At the same time, Manchester Water Works' laboratories perform approximately 40 daily tests on the water to assure that it is safe to drink. Please feel free to call us at 624-6482 for additional information about your water quality.

KEY TO TABLES

Definitions

MCLG: Maximum Contaminant Level Goal, or 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.

MCL: 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.

MRDLG: Maximum Residual Disinfection Level Goal. The level of 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 contaminants.

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.

AL: Action Level, or the concentration of a contaminant that, when exceeeded, triggers treatment or other requirements which a water system must follow.

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

Abbreviations

ppb = parts per billion

ppm = parts per million

pCi/l = picocuries per liter, measurement of radiation

NA = not applicable

NTU = Nephelometric Turbidity Unit

ND = not detected

< = less than

mg/l = milligrams per liter

BDL = below detection limit

P = presence of bacteria

2005 CONTAMINANT RESULTS

CONTAMINANT	UNIT	MCL	MCLG	AVERAGE LEVEL	RANGE	VIOLATION	MAJOR SOURCE
Inorganic Contaminants							
Lead	ppb	15 (AL)	0.0	9.5 90^{th} Percentile	0 – 38.0	NO	Corrosion of household plumbing systems; Erosion of natural deposits
Copper	ppm	1.3 (AL)	1.3	0.037	0 – 0.072	NO	Corrosion of household plumbing systems; Erosion of natural deposits; Leaching from wood preservatives
Barium	ppm	2.0	2.0	0.0124	0.0115 – 0.0142	NO	Erosion of natural deposits; Discharge from drilling wastes and metal refineries
Fluoride	ppm	4.0	4.0	0.01	0 – 1.6	NO	Water additive that promotes strong teeth; Erosion of natural deposits
Chlorine	ppm	4.0 (MRDL)	NA	0.51	0.02 – 1.51	NO	Drinking water disinfectant
Nitrate	ppm	10.0	10.0	0.02	0– 0.09	NO	Erosion of natural deposits; Runoff from fertilizer; Sewage leaching from septic tanks
Microbiological Contaminants							
Total Coliform	P	<5%	0%	<1%	0 – 1%	NO	Naturally present in the environment
Turbidity	NTU	0.3	0.0	0.07	0.05 – 0.14	NO	Soil runoff
Total Organic Carbon	mg/l	TT	NA	2.3	1.9 – 3.1	NO	Naturally present in the environment
Volatile Organic Contaminants							
TTHMs (Total Trihalomethanes)	ppb	80	NA	80.0	44 – 91	NO	By-product of drinking water chlorination
Total Haloacetic Acids (5)	ppb	60	NA	22.0	14 – 32	NO	By-product of drinking water disinfection
Methyl Tertiary Butyl Ether	ppb	13.0	0	0.12	0–0.5	NO	Residual from gasoline spill or leakage