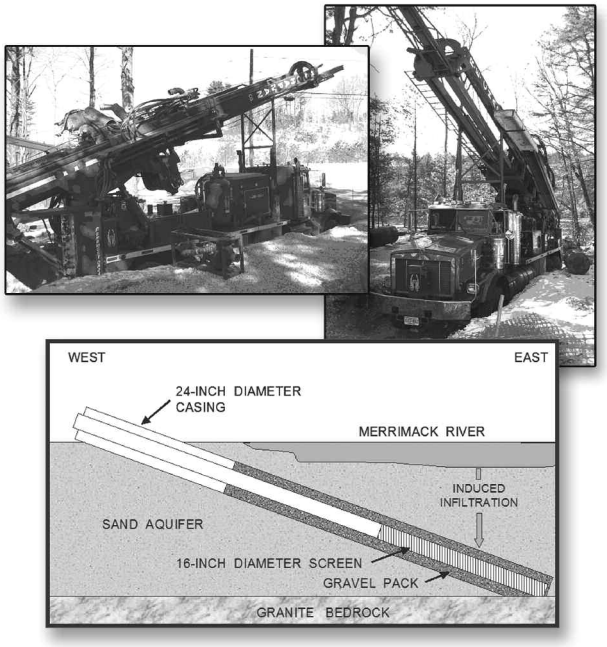
## River Bank Filtration

As our demand for water has increased, the availability of clean water sources has decreased. From drilling wells to building filtering plants, there have been many developments in this science. One method used for centuries combines both ideas. This approach is called River Bank Infiltration. (RBI)

The advantage to RBI is that the riverbed filters the water before it is drafted. This process works best where the riverbed is comprised mainly of sand and gravel. An intake screen placed directly below the bottom extracts the water without the microbes, algae, and general contamination flowing rivers sometimes contain.

Manchester Water Works is evaluating this technique as one possible solution to meet the region's need for water. At the same time, we will implement conservation programs for our customers. However, even with our best efforts, the impact of climate change and population growth will require the development of some added water resource within the next decade to keep our region and economy vital and healthy. Researchers from the University of NH and engineers skilled in this technology are currently working on this approach to answer the important questions of economics and feasibility.




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/**

Have a question about your account balance or wish to pay on line? Visit our new on-line service for details about your balance and payment history and click on Direct Pay – Now to pay your water bill.

MWW
**MANCHESTER WATER WORKS**
281 Lincoln Street
Manchester, NH 03103
603-624-6494

PARTNERSHIP FOR SAFE WATER

***Manchester Water Works is a proud member of The Partnership for Safe Water***

## Manchester Water Works

# 2008 WATER QUALITY REPORT

# Dear Valued Customer

In the 1870s, Lake Massabesic was selected as the source of drinking water for a growing Manchester because of its plentiful supply and pristine quality. Our fore-fathers could not have imagined the technology currently in use at the Water Treatment Plant to provide today's growing number of customers with drinking water that meets the ever increasing and complex federal standards.

This report, which is required of all public water utilities under the Safe Drinking Water Act, is intended to provide you with important information about the source and purity of your drinking water. We take great pride in the fact that all of our customers continue to receive water quality meeting the highest standards.

Last year, we reported that our disinfection byproduct levels listed under organic chemicals in the chart on a following page had dropped considerably with our conversion to ozone and chloramines. Those levels continued to decline during the course of this past year. We are also very pleased with the outcome of our triennial lead and copper monitoring. While previously reported levels have always been below the "action level" standard, the recent results were down considerably due to adjustment to our corrosion control program.

As drinking water regulations evolve over the next decade, Manchester Water Works will continue our effort to meet not only these standards, but your expectations for high quality public drinking water.

We invite you to learn more about your water utility by reviewing this information and by visiting our website, which is printed elsewhere in this publication.

Sincerely,

Thomas M. Bowen, P.E.
Director

# Where Have All The Aspirin Gone?

Today we're living longer, feeling better and looking pretty good for our age. That's thanks to modern medicine for the drugs and personal care products!

Drugs are prescribed for just about any physical and mental ailment you can think of... headaches, stomachaches, depression, infertility, high blood pressure and elevated cholesterol, to name a few. But even if you don't take anything yourself, this wave of drug use has a profound impact on your life because our environment has to assimilate all these left over and semi-digested drug products. Where do you think they go?

When drugs or personal care products are used, only a portion of them are actually removed from the environment. Others may end up in the waste stream and, ultimately, in our rivers. When a water utility downstream extracts water from this river, it may include a very small concentration of that waste.

Fortunately, waste streams do not feed into Lake Massabesic, which is isolated from wastewater discharges and sewerage treatment plants. For now, we have a well-protected supply that relies 100% on precipitation and natural springs for recharge. However, Manchester Water Works will keep a watchful eye on this issue and will be participating in research to determine alternate water treatment techniques for systems like ours. NHDES suggests using personal judgment with disposal of these materials and recommends that they should never be flushed down a toilet or sink. Instead, see if your pharmacy has a disposal policy, or bring them to a hazardous waste collection center. Alternatively, the materials can be disposed of in the household trash as long as they are double bagged. More information can be found at http://www.des.state.nh/us/factsheets/sw/sw-33.htm.

Please feel free to call if you have questions or concerns regarding this topic. We always want our customers to be informed about the quality of their drinking water.

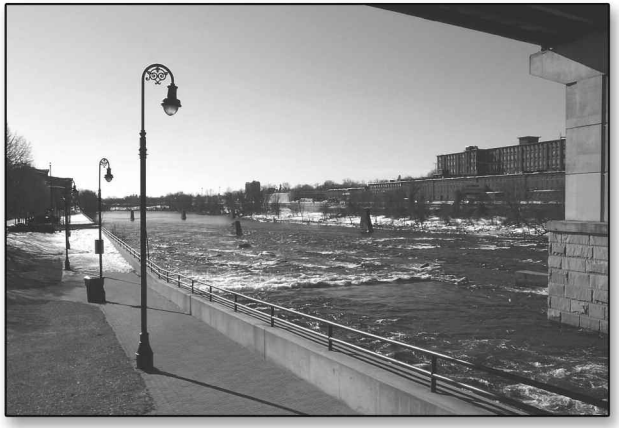
# Water Resource Planning

In 1869, J.B. Sawyer, a Civil Engineer working for the City of Manchester, wrote a report to the Directors of the City Aqueduct Company concerning their upcoming decision to designate a water supply for the City.

Mr. Sawyer's final recommendation was to use Lake Massabesic as the source, but not until the advantages and disadvantages of the Merrimack River, the Piscataquog River and Maple Falls in Hooksett as alternatives were examined. On the feasibility of Lake Massabesic as the water source he stated: *"It is evident enough that there is more water in the lake of this name than the city will ever require…."*

Today Lake Massabesic is the sole source of water supply for the City of Manchester, just as it has been since 1872 when it was first used. The acquisition of nearly 8,000 acres of property around the lake has isolated it from the "*secretions and excretions*" J.B. Sawyer warned of in his initial report. Today we face new challenges, such as contamination from salt and invasive species that threaten its quality, and increasing demands that will soon require a supplemental source.

J.B. Sawyer had a sound long-term plan and one that Manchester Water Works has followed over the years. Even with more efforts in the area of conservation, an additional source of supply must be found within the next decade. The Merrimack River that was rejected in 1869 now looks like a good bet and one that we will be studying as a viable and cost effective alternative water source for our customers.



# Water Quality & 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 – 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 (note that Manchester does not have lead service lines) and home plumbing. Manchester Water Works 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 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 (800-426-4791) or at ***http://www.epa.gov/safewater/lead***.

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised 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

**1st Place**
**Kelsi McGrath,** *Northwest Elementary School*


### 4th Grade Water Science Fair Top Winners

**1st Place**
**Hannah Parè,** *Northwest Elementary School*

**2nd Place**
**Parker McBride,** *Smyth Road School*

**Zara Morrissey,**
*Parker Varney School and* ***"Salt Water Volcano"***

**Travis Byers,** *Gossler Park School and* ***"Water Electrolysis"***

# Manchester Water Works Source of Supply

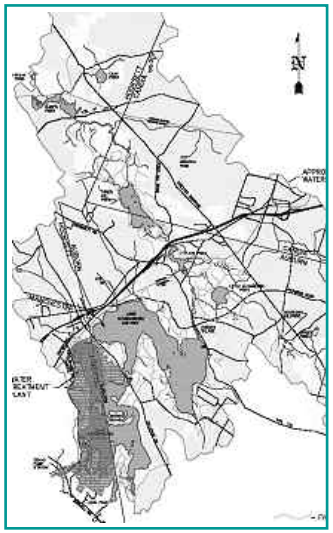
Lake Massabesic, located in Manchester and Auburn, has a surface area of about 2,500 acres with a gross storage capacity of nearly 15 billion gallons. Two large ponds join to comprise the entire lake. Together they create about 28 miles of shoreline and, when filled to the crest of the main outlet dam, the lake surface elevation is 250 feet above mean sea level. Supplementing the lake supply is an upland man-made impoundment known as Tower Hill Pond, which is located in the towns of Auburn and Candia, and contains an additional billion gallons.

The drainage basin for Lake Massabesic is approximately 42 square miles. In order to protect water quality, Water Works owns and controls the use of slightly more than 8,000 acres or nearly 30% of the most sensitive watershed land. As added protection, the Water Works also employs a staff of watershed patrol officers who monitor all activity and enforce watershed regulations aimed at protecting the quality of Lake Massabesic.

While this land and water body is protected for drinking water use, certain limited activities are allowed. These activities are limited to passive recreation and non-motorized vehicles on the land outside a restricted area. Certain types of boating on Massabesic are also only allowed outside restricted areas.

## Lake Massabesic and Watershed

**For more information regarding the Massabesic Watershed, go to our website, or check NHDES for their 2002 Source Water Assessment of the Massabesic Watershed, which categorized the watershed with four high, four medium, and five low level vulnerabilities.**



**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 shown below provides information about those contaminants that were detected in Manchester's water in 2007. 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 50 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, take a look at MWW's website for a typical analysis of both raw and treated water.

## 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

## 2007 CONTAMINANT RESULTS

| ANALYTE | UNIT | MCL | MCLG | LEVEL | RANGE | VIOLATION | SOURCE |
|---|---|---|---|---|---|---|---|
| **Inorganic Chemicals** | | | | | | | |
| Lead | ppb | 15 (AL) | 0 | 3.0 | <1 – 18 | NO | Corrosion of household plumbing systems; Erosion of natural deposits |
| Copper | ppm | 1.3 (AL) | 1.3 | 0.032 | <0.01 – 0.16 | NO | Corrosion of household plumbing systems; Erosion of natural deposits; Leaching from wood preservatives |
| Barium | ppm | 2 | 2 | 0.009 | 0.007 –0.1 | NO | Erosion of natural deposits; Discharge from drilling wastes and metal refineries |
| Fluoride | ppm | 4.0 | 4.0 | 1.141 | 0.80 – 1.48 | NO | Water additive that promotes strong teeth; Erosion of natural deposits |
| Chloramines | ppm | 4.0 | 4.0 | 1.03 | 0.06 – 2.7 | NO | Water additive used to control microbes. |
| Nitrate | ppm | 10.0 | 10.0 | 0.26 | 0.0 – 0.60 | NO | Erosion of natural deposits; Runoff from fertilizer; Sewage leaching from septic tanks |
| Chromium | ppb | 100 | 100 | 0.5 | 0.0 – 0.5 | NO | Discharge from steel and pulp mills; Erosion of natural deposits. |
| **Microbial Related Measurements** | | | | | | | |
| Total Coliform | P | <5% | 0% | <1% | Absent – 2% | NO | Naturally present in the environment |
| Turbidity | NTU | TT | N/A | 0.07 | 0.03 – 0.21 | NO | Soil runoff –a measurement of cloudiness of the water and a way to judge treatment efficiency |
| Total Organic Carbon | ppm | TT | N/A | 1.7 | 1.3 – 2.3 | NO | Naturally present in the environment |
| **Organic Chemicals** | | | | | | | |
| Trihalomethanes | ppb | 80 | N/A | 3 | 1 – 5 | NO | By-product of drinking water chlorination |
| Haloacetic Acids | ppb | 60 | N/A | 5 | 1 – 12 | NO | By-product of drinking water disinfection |
| Bis (2-ethylhexyl) phthalate | ppb | 6 | 0 | 15 | 0 – 15 | NO | Discharge from rubber and chemical factories |