



Water Quality

ANNUAL REPORT

To Our Customers

I am pleased to present you this year's Concord Public Works' Annual Water Quality report, which details basic information regarding our water treatment and distribution systems, how we monitor water quality, and valuable information and tools necessary to use water as efficiently as possible.

Water Division staff worked throughout 2006 to ensure that Concord continues to comply with all state and federal drinking water standards including three new regulations promulgated by the U.S. Environmental Protection Agency (EPA). These regulations, described within this report, will provide further protection of public health and safety by requiring increased monitoring and treatment.

As many of you may know, the Division also continued to work in cooperation with the Concord Municipal Light Plant on the installation of radio reading technology. This eliminates the need for a meter reader to walk up to each customer's building to get water and electric meter readings. When completed in 2009, meter readers will be able to receive information broadcast from these meters while simply driving down the street.

Please take a moment and leaf through the information on the following pages. I hope you find it easy to read and helpful. Your feedback is important to us, so do not hesitate to contact us if you have any questions or comments regarding this report or the water system.

Respectfully,

Alan H. Cathcart,
Superintendent, Water/Sewer Division
Concord Public Works

2006 HIGHLIGHTS

- Construction was initiated on a new iron and manganese filtration plant at the Deaconess well site. This facility will house treatment equipment for both the Deaconess and White Pond well sites and will improve drinking water quality for the entire community.
- In conjunction with the successful completion of the Phase 1 Sewer Project, over 1,600 feet of water main was replaced in the Elm Brook neighborhood and 2,300 feet of new water main was added to the system along Cambridge Turnpike and Bolton Street.
- The 2.5 million gallon reservoir at Annursnac Hill was drained, inspected, and repaired.
- The Town adopted a senior discount rate for water customers over the age of 65 with limited income.
- A \$31,000 grant was awarded by the Massachusetts Environmental Trust to implement the Community Conservation Challenge, a water conservation outreach campaign.

Water Supply

Concord's water system consists of six groundwater supply wells located in Concord and one surface water supply located on the Acton/Littleton town line. In addition, it has associated pumping stations, two storage reservoirs with a 7.5 million gallon total capacity, approximately 122 miles of water main, and 1,227 fire hydrants. Depending on the season, all available production facilities may be called upon to satisfy system demands which may fluctuate between 1.5 million gallons per day (MGD) during the winter months to over 4 MGD in the summer. Concord's public water system is interconnected with Acton and Bedford for emergency backup, if ever needed.

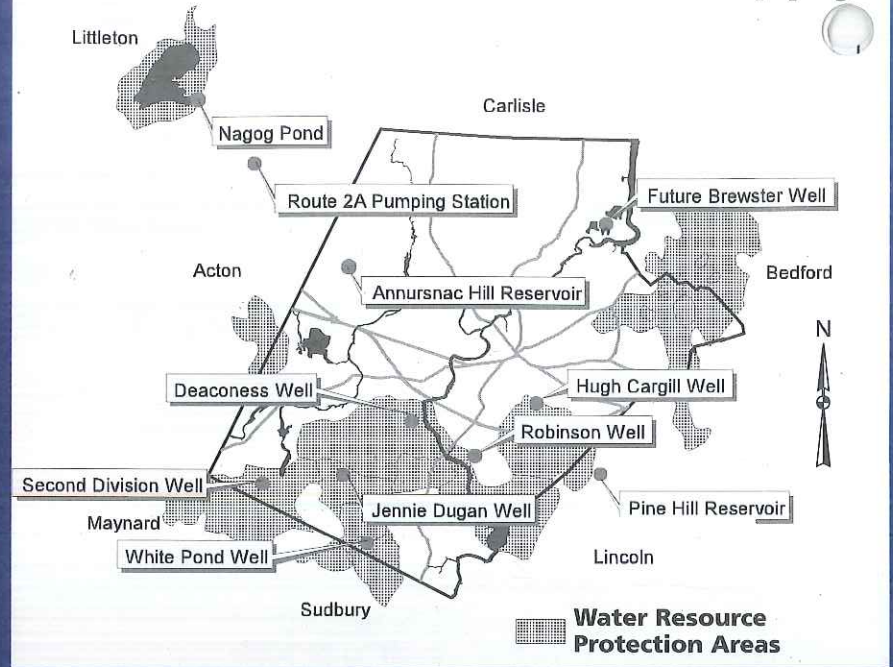
Quality Control

To ensure that tap water is safe to drink, the EPA enforces regulations that require stringent monitoring of specific contaminants within public water supply systems. Within Concord's system, over 500 tests are run each year to assess approximately 145 potential contaminants. We are proud to report that Concord's water quality testing program not only meets EPA's requirements for drinking water but goes above and beyond those requirements to satisfy the higher standards we have set for ourselves. Additional water quality information is available on our website at www.concordnet.org.

Water Treatment

In accordance with state and federal drinking water requirements, Concord water is treated before it gets to your tap. Treatment includes: *disinfection*—via the addition of liquid chlorine at all groundwater supplies and ozone/UV light plus chlorine gas at the Nagog Pond water supply; *corrosion control*—via the addition of potassium hydroxide to raise the natural pH of the water and reduce its corrosiveness to household plumbing; *fluoridation*—via the addition of sodium fluoride to help in the prevention of tooth decay; and *iron sequestration*—performed by adding polyphosphate or sodium silicate to reduce the frequency of discoloration events.

Town of Concord Water Supply



Questions?

For more information about Concord's drinking water and its supply system contact Matthew Mostoller, Environmental Analyst at Concord Public Works 978-318-3250 or visit our website at www.concordnet.org.

Potential Sources of Contaminants

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 will dissolve naturally occurring minerals and, in some cases, radioactive material, and can pick up other substances resulting from the presence of animals or human activities. Contaminants that might be expected in untreated water include: biological contaminants such as viruses and bacteria; inorganic contaminants, such as metals and salts; pesticides and herbicides; organic chemicals from industrial or petroleum use; and radioactive materials.

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SOURCE TREATMENT

	Nagog Pond Acton, MA	Second Division Well	Deaconess Well	Robinson Well	Jennie Dugan Well	White Pond Well	Hugh Cargill Well
pH Adjustment for Corrosion Control	•	•	•	•	•	•	•
Ultra Violet Light for Disinfection	•						
Chlorine for Disinfection	•	•	•	•	•	•	•
Ozone for Disinfection	•						
Fluoride to Promote Strong Teeth	•	•	•	•	•	•	•
Polyphosphate for Iron & Manganese Treatment	•	•	•	•	•	•	•
Sodium Silicate for Iron & Manganese Treatment & Corrosion Control			•				

Water Quality Summary

Listed below are the substances detected in Concord's drinking water in 2006. The presence of these substances does not necessarily indicate that the water poses a health risk. These substances are divided into 3 categories, Primary, Secondary, and Lead & Copper Parameters. Primary parameters protect drinking water quality by limiting the levels of contaminants that can adversely affect public health and are known or anticipated to occur in public water systems. Secondary parameters are set for aesthetic purposes and are designed to assist the EPA in determining their occurrence in drinking water and whether future regulation is warranted. Not listed are over 130 substances we tested for but did not detect. All substances listed below are in units of ppm (parts per million) unless otherwise noted.

PRIMARY PARAMETERS

Substance	Highest Level Detected	Range of Levels Found	Highest Level Allowed (EPA's MCL)	Ideal Goal (EPA's MCLG)	Major Sources in Drinking Water
Arsenic	0.004	ND-0.004	0.01	0	Erosion of natural deposits, Runoff from agriculture
Barium	0.03	0.004-0.03	2	2	Erosion of natural deposits
Chlorine	1.22	0.02-1.22	4 (MRDL)	4 (MRDLG)	Water treatment for disinfection
Fluoride*	1.35	ND-1.35	4	4	Water treatment for tooth decay prevention
Haloacetic Acids (ppb)	2.4**	ND-7.6	60	No Standard	By-product of drinking water disinfection
Nitrate	1.9	0.38-1.9	10	10	Runoff from fertilizer use; Erosion of natural deposits
Trihalomethanes (ppb)	14.3**	1.6-36	80	No Standard	By-product of drinking water disinfection

SECONDARY PARAMETERS

Substance	Highest Level Detected	Range of Levels Found	Highest Level Allowed (EPA's MCL)	Ideal Goal (EPA's MCLG)	Major Sources in Drinking Water
Aluminum	0.03	ND-0.03	No Standard	No Standard	Erosion of natural deposits
Calcium	21.2	9.2-21.2	No Standard	No Standard	Erosion of natural deposits
Chloride	108	19.9-108	250	250	Naturally present in the environment
Hardness	78	32-78	No Standard	No Standard	Erosion of natural deposits
Iron	1.2	ND-1.2	0.3	No Standard	Erosion of natural deposits
Magnesium	6.1	2.3-6.1	No Standard	No Standard	Erosion of natural deposits
Manganese	0.22	ND-0.22	0.05	No Standard	Erosion of natural deposits
Nickel	0.006	ND-0.006	No Standard	No Standard	Erosion of natural deposits
Potassium	42	8.9-42	No Standard	No Standard	Naturally present in the environment
Sodium	40.3	7.3-40.3	No Standard	No Standard	By-product of drinking water treatment; Naturally present in the environment
Sulfate	41.2	9.5-41.2	250	No Standard	Naturally present in the environment
Total Dissolved Solids	420	103-420	500	500	Naturally present in the environment
Zinc	0.03	ND-0.03	5	No Standard	Naturally present in the environment

LEAD & COPPER PARAMETERS***

Substance	90th Percentile Level Detected	Range of Levels Found	90th Percentile Action Level (EPA's MCL)	Ideal Goal (EPA's MCLG)	Major Sources in Drinking Water
Lead (ppb)	2	ND-31	15	0	Household plumbing, see statement below
Copper	0.31	0.04-0.35	1.3	1.3	Household plumbing, see statement below

TERMS & ABBREVIATIONS

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

MCL: (Maximum contaminant Level) The highest level of a contaminant that is allowed in drinking water. MCL's are set as close to the MCLG's as feasible using the best available treatment technology.

MCLG: (Maximum Contaminant Level Goal) The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLG's allow 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 expected risk to health.

MRDLG's do not reflect the benefits of the use of disinfectants to control microbial contaminants.

ppb: parts per billion or micrograms per liter

ppm: parts per million or milligrams per liter

ND: none detected

* **Fluoride:** The Department of Public Health's ideal goal for fluoride is 1 ppm.

** **Haloacetic Acids and Trihalomethanes:** The highest level detected represents the highest running annual average for these contaminants. The range of levels found may have results in excess of the MCL but the running annual average of all sample locations is used to determine compliance.

*** **Lead and Copper:** In accordance with EPA regulations, Concord Public Works tests the tap water of 30 homes in Concord for lead and copper every 3 years. Testing was last done during August and September 2005 and is next scheduled for completion during the summer of 2008. EPA determines whether the protection against corrosion is sufficient by requiring that at least 90% of the sampled homes have lead levels under 15 parts per billion (ppb). This is called the Action Level.

Important Information From EPA About 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 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. Additional information is available from the Safe Drinking Water Hotline (800-426-4791).

Water Conservation

In 2006, water use was down approximately 5 percent over 2005. That's to be expected, since the summer of 2006 started off wetter and cooler than normal. In fact, Concord received over 12 inches of rain during June and July.

As we enter the "peak" water season of 2007, we again remind our customers to use water efficiently. All six ground-water supply wells and Nagog Pond are often required to operate at maximum levels during the summer. When this occurs, there is more wear and tear on town pumps, water quality is subjected to greater variation and production costs are increased. It makes little sense to pump water (a finite resource) from the ground, treat it to enhance its quality so it's safe to drink, send it through miles of pipeline, only to waste it.

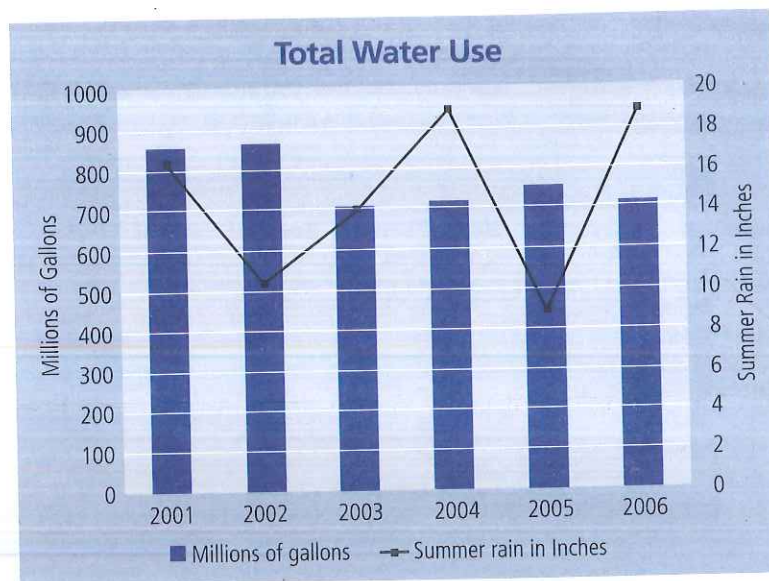
Being "water-efficient" means using less water to provide the same benefit. There are many ways to enhance your water efficiency—detecting and fixing leaks, installing high-efficiency clothes washers and toilets, and watering lawns and gardens with the minimum amount of water needed. This year, thanks to a grant from the Massachusetts Environmental Trust, we are able to offer numerous opportunities to cut your water use: toilet replacement rebates, water-use audits, educational workshops, irrigation system audits and more.

You are encouraged to take advantage of these opportunities to conserve water and reduce water bills. Contact Water Conservation Coordinator, Joanne Bissetta, at 978-318-3259 for further information or visit our website, www.concordnet.org/cpw.

Seasonal Rates Start May 1

Concord's Water Conservation Rate is in effect each year between May 1 and October 31 for residential customers. Water customers using more than 2,400 cubic feet of water bimonthly (more than 300 gallons daily) pay higher rates for their extra consumption, reflecting the higher cost of meeting peak water demand. Below are proposed rates, effective June 1, subject to Public Works Commission approval. One hundred cubic feet = 748 gallons.

- Base Rate:** \$3.61 per 100 cubic feet (ccf) bimonthly.
Step 2: \$6.71 per ccf for 2,500 – 4,800 cubic feet bimonthly May 1 through October 31.
Step 3: \$8.83 per ccf over 4,800 cubic feet bimonthly May 1 through October 31



Opportunities for Learning

All of the workshops listed below are free and open to the public. To ensure adequate materials are available, please register by calling 978-318-3259 or by emailing joanneb@concordnet.org. Funding for these workshops is provided by the Massachusetts Environmental Trust.

Healthy Lawn Workshop, 10 a.m., Saturday, March 31, Mahoney's Garden Center, 1625 Sudbury Road. Tips and tools to help you care for your lawn without using chemical pesticides and fertilizers.

Water Conservation 101, 7 p.m., Wednesday, April 11, in the Hearing Room at the Town House. Presented by Water Conservation Coordinator Joanne Bissetta and a local plumber, you will learn how to check for leaks and perform simple repairs that you can do at home. Bring your questions! Call 978-318-3259 to register.

Native Landscaping, 7–9 p.m., Wednesday, May 9, at CCHS. Learn how to reduce maintenance and water use by incorporating native, low-water use plants into your landscape. Discover the importance of the "right plant in the right place," the benefits of compost and the value of healthy soil. Presented by Donald Bishop, landscape consultant and owner of "Gardens Are..." a Marlborough-based organic landscaping and design business.

Water-Efficient Lawn Care, 7–9 p.m., Tuesday, May 15, at CCHS. Come hear from U-Mass Extension Turf Expert Mary Owen about the best management practices to cultivate a healthy lawn that doesn't require excessive watering.

Irrigation Systems 101, 9–11 a.m., Saturday, June 2, at the Town House. Certified Irrigation Auditor and Contractor Ted Moriarty will guide you on how to properly maintain your irrigation systems.

News and Notes

Let's Make Water Conservation a Habit

In-ground Irrigation Bylaw

Town bylaw requires that all in-ground irrigation systems connected to the public water supply be registered with the Town and equipped with automatic timers, rain sensors and backflow prevention devices. Call 978-318-3250 or go to www.concordnet.org/cpw for registration forms.

Special Offer for In-Ground Irrigation Owners

Want to learn how to water your lawn more efficiently? Concord Public Works will send a certified irrigation system auditor to check out your system top-to-bottom. You will receive a report documenting your property's irrigation water use with recommendations for repairs and/or improvements that can save water and cut summer water bills. Call 978-318-3259 to schedule an audit. *Limited time offer.*

"Water-Smart" Landscape Plans

Thanks to grants from The Garden Club of Concord and the Massachusetts Department of Environmental Protection, four landscape templates have been developed by local landscape designers. These landscapes, once established, are easy to maintain and require little or no supplemental water. These templates are posted on our website www.concordnet.org/cpw and are available as handouts at our office at 135 Keyes Road.

Rain Barrel Only \$56.50*

Additional barrels \$66.50 each

Collect rainwater for
your garden and plants

To order, contact the New England Rain Barrel Company at 877-977-3135 (toll free) or order online at www.nerainbarrel.com.

Order by May 18

Pick up rain barrels at CPW, 135 Keyes Rd.
on Wednesday, May 23



* Discount offer limited while supplies last

CPW Offers Free Water Audits

Want to conserve but aren't sure where to start? Concord Public Works will send a certified water-use advisor to your home to conduct a free water-use audit. You will receive a computer printout documenting your household's water consumption and recommendations for conservation. The report even calculates potential savings on water bills that can be achieved by adopting conservation recommendations. To sign up for an audit, call 978-318-3259 or email joanneb@concordnet.org.

Join the Community Conservation Challenge

Applications are still being accepted from community groups and individuals interested in joining the Community Conservation Challenge, an outreach campaign sponsored by Concord Public Works (CPW) and the Massachusetts Environmental Trust that links water conservation with fundraising by local non-profit organizations

The Community Conservation Challenge will raise awareness about the importance of water efficiency by providing an incentive to water customers to save water. Participating water customers that use less water next summer will earn funds for local organizations that they care about.

Local groups such as civic organizations, business groups, arts associations and others are eligible to participate. CPW will help participants learn how to become more water-efficient

by offering workshops, water use audits, toilet replacement rebates and more. If successful at reducing their water use, groups can earn up to \$1,000.

All Concord water account holders are able to participate. Go to www.ConservationChallenge.org for more information or contact Water Conservation Coordinator Joanne Bissetta at 978-318-3259 or joanneb@concordnet.org for more information. Application deadline is Friday, April 13.

The town received a \$31,000 grant from the Massachusetts Environmental Trust to conduct the Challenge. Grant funds are derived primarily through the sales of the Trust's environmental license plates.





Concord Public Works Joins EPA's WaterSense

Americans use large quantities of water inside and outside of their homes. Here in Concord, the average family of four uses about 9,000 gallons of water every month.

WaterSense is a voluntary public-private partnership program sponsored by the U.S. Environmental Protection Agency. Its mission is to protect the future of our nation's water supply by promoting and enhancing the market for water-efficient products and services. Saving water is easy—many products are already available for use, and it doesn't require changing the way most of us live or do business. By choosing products labeled through the WaterSense program, you know you'll be saving water for future generations.

WaterSense helps conserve water by providing information on products and programs that save water without sacrificing performance. In fact, every average household that fully adopts water efficient products and practices saves 30,000 gallons per year—enough to supply a year of drinking water for 150 thirsty neighbors.

Soon, you'll start seeing products with the WaterSense label. These products will have significant water savings over traditional products, just as the EnergyStar label has come to represent significantly more energy-efficient equipment. Using WaterSense labeled products and services will save you at least 20 percent of water over average counterparts. High-efficiency toilets are among the first products to be certified by WaterSense. As of April 1, Concord



water customers that replace an old toilet with a WaterSense toilet are eligible for a rebate of up to \$150. As a Promotional Partner with the Water-Sense program, Concord Public Works will help keep you informed of the latest WaterSense products and opportunities.

For more information, please visit www.epa.gov/watersense.

Show You Care

Is your lawn chemical pesticide-free? Have you "gone organic?" If so, display your commitment to reducing the use to toxic chemicals that can threaten the environment, as well as the health of your family and pets. As part of the Healthy Lawns for Healthy Families campaign funded by the UMass-Lowell Toxics Use Reduction Institute, Concord Public Works has lawn signs available to residents wishing to promote their "healthy" lawns. Call Joanne Bissetta at 978-318-3259 to get your sign today. For more information about reducing pesticide use and organic lawn care, visit www.healthylawnsforhealthyfamilies.com.

Ask me about
**Healthy
Lawns for
Healthy
Families**



Or go to
www.healthylawnsforhealthyfamilies.com

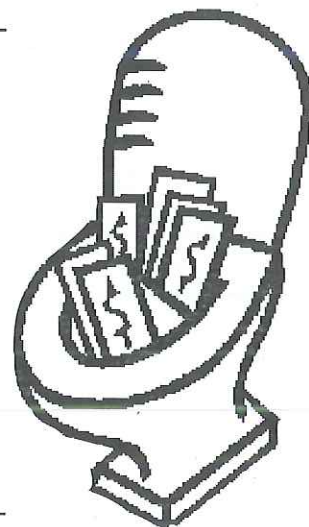
Sponsored by a grant from
the UMass-Lowell Toxics Use
Reduction Institute

New! Changes to Toilet Replacement Rebate Program

Starting April 1, the following changes will be effective:

- Only toilets meeting the Uniform North American Requirements (UNAR) for toilets are eligible for rebates.
- **High Efficiency Toilets** (max. 1.3 gallons/flush) and those with the WaterSense label will be rebated at \$150 each.
- **Regular low-flow toilets** (1.6 gallons/flush) are eligible for a \$75 rebate.
- Commercial water account holders will be eligible for new toilet rebates.

For rebate instructions, forms, and the list of eligible toilets, go to www.concordnet.org/cpw or call 978-318-3259



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Drinking water, including bottled water, may reasonably be expected to contain at least some small amounts of certain substances which the EPA calls "contaminants." The presence of these substances does not necessarily indicate that the water poses a health risk. For example, naturally occurring dissolved minerals are commonly found in well water. More information about the substances found in drinking water and their potential health effects can be obtained by calling the EPA's Safe Drinking Water Hotline at 1-800-426-4791 or the Massachusetts Drinking Water Program at 1-617-292-5770.

Drinking Water and People with Weakened Immune Systems

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

Regulatory Update

In 2006, the United States Environmental Protection Agency (EPA) promulgated three new drinking water regulations requiring increased monitoring and treatment to reduce risks for potential chemical or pathogenic exposure.

The Long-Term 2 Enhanced Surface Water Treatment Rule (LT2) and Stage 2 Disinfection Byproduct Rule (DBPR) complement each other. Together they increase protection against pathogens such as *Cryptosporidium* and *E. coli* (LT2) and reduce risks associated with disinfection byproducts (DBPR). Raw water monitoring for LT2 has been done at Nagog Pond in anticipation of this rule. Assessment of disinfection by-products (break down of chlorine over time) has also been on-going and results are typically well below the limits set by EPA.

The Groundwater Rule protects against potential microbial contamination. Concord is already protected through the use of liquid chlorine and land use regulations. Source water samples indicate that no significant risks exist in Concord, and should any deficiencies be found, corrective actions will be implemented.

In addition to these EPA regulations, the Massachusetts Department of Environmental Protection (DEP) established a drinking water standard for perchlorate, a chemical commonly used in blasting operations, fireworks, and military applications. Baseline monitoring initiated in 2004 showed that the chemical was not present in any of Concord's water sources. Ongoing monitoring is required under the new state law, which is the most stringent in the country.



Annursnac Hill Reservoir

This structure was originally built in 1908 as an open air storage facility and in the mid-seventies was covered over with a geodesic dome to prevent contamination. Not only does it provide storage capacity to meet demand and fire suppression, it also acts as a pressure regulator for the water system. Combined with the 5 million gallon Pine Hill Reservoir, located in Lincoln, we are able to enhance pressure and ensure a supply of water during power outages.

During the late fall and early winter this 2.5 million gallon finished water storage reservoir was taken out of service for inspection, cleaning, and repairs. Significant work was performed by Division personnel including concrete repairs, new screening, repairs to the dome, reconfiguration of the overflow, and operational improvements. Upon completion of this work, the facility was disinfected, filled and purged, and after water quality monitoring indicated stabilization, was finally returned to service. Additional work is planned for the future to insure the longevity of this facility, reduce water loss, and improve water quality.

Get Involved

The Public Works Commission is the overseeing body of CPW and their meetings provide an opportunity to become more involved in issues relating to the water system. They typically meet the second Wednesday of each month at 7 pm. Please check the CPW website for exact dates and location. For more information regarding water quality and resource protection initiatives, or if you have a neighborhood concern in a resource protection area (depicted on map, page 2), please contact Matthew Mostoller, Environmental Analyst at 978-318-3250 or mmostoller@concordnet.org.

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Printed on 100%
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Concord, MA 01742

CONCORD PUBLIC WORKS
Water/Sewer Division
PWS ID 3067000
135 Keyes Road
Concord, MA 01742



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Free Water Conservation Devices

Concord Public Works wants to help you conserve water. Stop by our office at 135 Keyes Road weekdays 7:30 a.m. - 4 p.m. or call Joanne Bissetta, Water Conservation Coordinator, at 978-318-3259.



Rain Gauge - Keep track of rainfall to avoid over-watering your lawn.



Bathroom Flip Aerator - Temporarily halt the flow of water with a flip of the switch without readjusting temperature controls. Great for shaving and brushing teeth.

Dual Setting Flip Aerator with Swivel for the Kitchen - A swiveling aerator that has a full flow for filling pots, a wide spray for rinsing fruits and vegetables, and a flow restrictor for use when washing dishes.



Low-flow Showerhead - An attractive, high-quality showerhead that uses 2.0 gallons per minute that doesn't feel "low-flow." Cut your shower water use in half.

"Water Miser" Garden Hose Nozzle - Enjoy watering your garden with this six-spray pattern nozzle that ranges from a fine mist to a high-powered spray.

Shower Timer - Helps you keep your showers to five minutes.

Presentations to Local Groups

Concord Public Works staff is available to come to your organization to talk about water resource protection and conservation. Give us a call!