

For more information, please contact MWRA at (617) 242-5323, or visit [www.mwra.com](http://www.mwra.com).

## WATER QUALITY UPDATE An Analysis of November 2006 Sampling Data

MASSACHUSETTS WATER RESOURCES AUTHORITY  
100 First Avenue, Charlestown Navy Yard, Boston, MA 02129



## MWRA WATER QUALITY UPDATE

### November 2006 Highlights

- **MWRA has once again met the Lead Action Level.** The 90 percent value for the latest sampling round was 12.5 ppb, below the standard of 15 ppb. MWRA has now met six straight rounds, and 9 of the last 11. Even though MWRA as a system met the Lead Action Level, some homes may still have elevated levels in stagnant water due to household plumbing. For more information read the Special Update on page 10.
- **Carroll Water Treatment Plant is undergoing winter maintenance. On November 1, Train A was shut down, isolated, dechlorinated and drained to allow maintenance and other work to be completed.** On November 30, MWRA began filling Train A. It will be disinfected using American Water Works Association standards before being placed back into service.
- **Bird harassment and observation at Quabbin Reservoir** was initiated on the October 30th. DCR staff continued activities that included observation and harassment. Boat-based harassment performed from 3:30PM until one hour after dark has been effective in keeping waterfowl away.
- **An interesting note on hardness.** Since MWRA water is soft, you can save money on dishwasher detergent as well as other soaps and shampoos. You do not need to fill your dishwasher detergent cups full – generally half or less is enough for our soft water. Using too much may etch your glasses and dishes as well as waste detergent. The hardness of MWRA water averages about 18 to 20 mg/L, or about 1 grain/gallon.
- **MWRA achieved CT disinfection requirements for the month** at the Ware Disinfection Facility and the Carroll Water Treatment Plant. CT results appear on Page 5. No community violated the Total Coliform Rule criteria. See Page 7.

We are continually updating the report. Let us know what you think **(617) 242-5323**

Call **(617) 242-5323** or email [Joshua.Das@mwra.state.ma.us](mailto:Joshua.Das@mwra.state.ma.us)

Release Date: December 20, 2006

## Water Quality Update

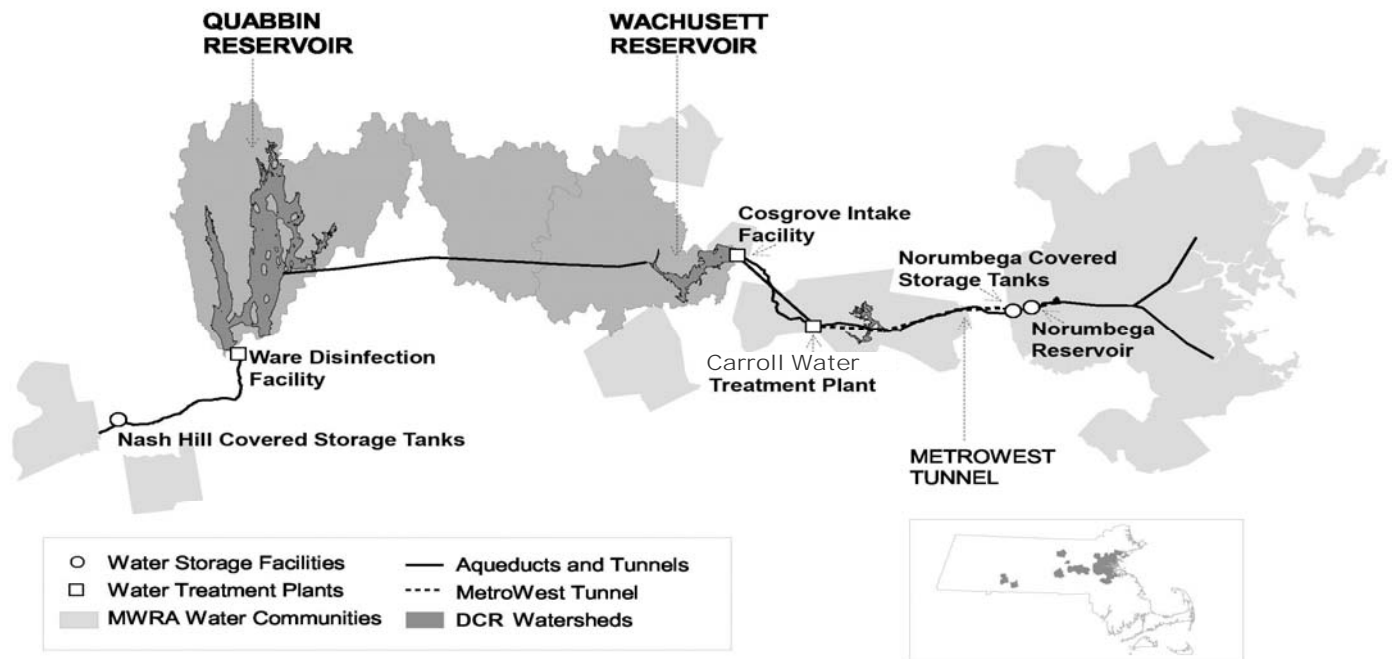
This is a monthly report containing information about the quality of water supplied by MWRA. It provides a more detailed review of water quality than the annual water quality report that is mailed each June to customers in our service area. The report is available at [www.mwra.com](http://www.mwra.com).

## The Water System

The MWRA supplies wholesale water to local water departments in 50 communities, 44 in greater Boston and MetroWest, three in Western Massachusetts, and as a back-up supply for three others. Each municipality is responsible for distributing the water within its own community. More than two million people are served by the MWRA water supply system.

Quabbin Reservoir is the primary source of water for our system and one of the country's largest water supply impoundments, with a capacity of 412 billion gallons. Quabbin water represents source water for the Chicopee Valley Aqueduct (CVA) system. Water is transferred from Quabbin Reservoir to the 65 billion gallon Wachusett Reservoir in Clinton via the Quabbin Aqueduct. Wachusett water represents source water for MetroWest and Metropolitan Boston communities. The watershed areas of the Quabbin and Wachusett Reservoirs total 401 square miles. The Department of Conservation and Recreation (DCR), which manages the watersheds, and MWRA are committed to protection of the water supply through aggressive watershed protection as the first line of defense against water contamination. Three-quarters of the watersheds are protected lands and over 80% are either forest or wetlands.

The map below indicates the location of reservoirs, treatment facilities, and service communities.



## Indicators of Water Quality

Tests are conducted on water sampled at the source reservoirs (source or raw water) and also on water after treatment (treated water). MWRA routinely uses six general indicators of water quality: microbial, corrosiveness, disinfection by-products, turbidity and algae, disinfectant residual, and mineral analysis. Testing frequencies vary by parameter.

The Federal Safe Drinking Water Act (SDWA) sets standards for source and treated water quality. The standards relate to coliform, turbidity, watershed protection, disinfection and disinfection by-products, over 120 potential chemical contaminants, and waterborne disease outbreaks. MWRA monitors for these parameters on schedules ranging from daily to annually.

Customer communities must also meet certain standards under the SDWA concerning distribution of treated drinking water. The Total Coliform Rule (TCR) helps to alert communities to possible microbial contamination as well as the adequacy of residual disinfection within the local distribution system. MWRA tests over 1500 samples per month. Under the SDWA, a violation of the TCR occurs when greater than 5% of the samples in a community are positive for total coliform during a month.

# Source Water – Microbial Results

## November 2006

### Source Water - Microbial Results

Total coliform bacteria are monitored in both source and treated water to provide an indication of overall bacteriological activity. Most coliforms are harmless. Fecal coliform, a subclass of the coliform group, are identified by their growth at temperatures comparable to those in the intestinal tract of mammals. They act as indicators of possible fecal contamination. The Surface Water Treatment Rule for unfiltered supplies requires that no more than 10% of source water samples prior to disinfection over a six-month period have more than 20 fecal coliforms per 100ml.

#### Sample Site: Quabbin Reservoir

Quabbin Reservoir water is sampled at the Ware Disinfection Facility (WDF) raw water tap before entering the CVA system. MWRA met the six-month running average standard for fecal coliform continuously at this location during the last year. DCR initiated their bird harassment program on October 30.

Nineteen of the 30 samples were positive during November. None of the samples exceeded a count of 20 cfu/100ml.

For the current six-month period, 0.0% of the samples have exceeded a count of 20 cfu/100ml.

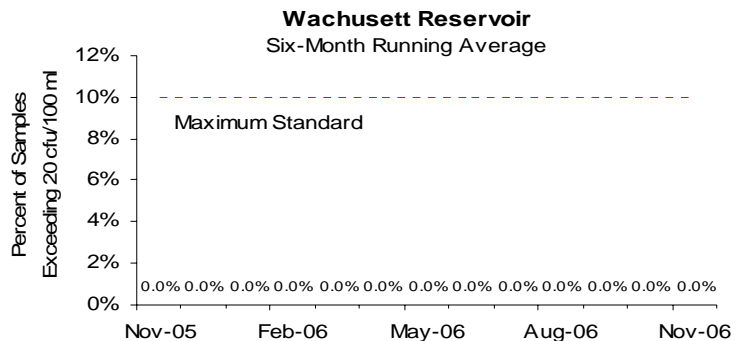
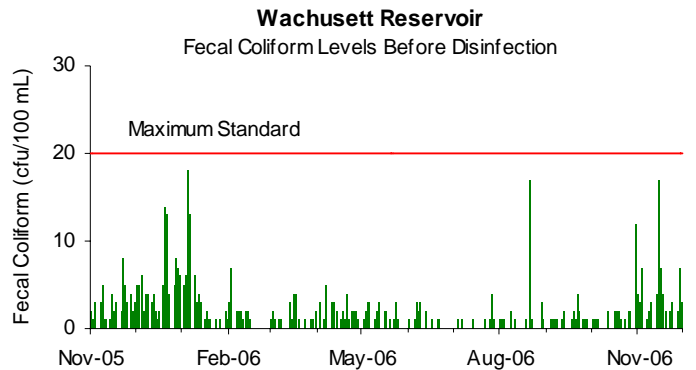
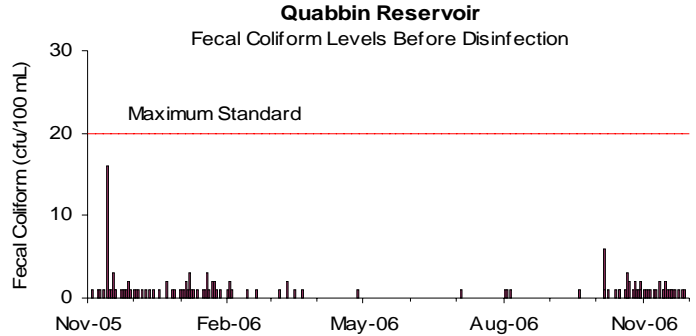
#### Sample Site: Wachusett Reservoir

Wachusett Reservoir water is sampled before it enters the MetroWest/Metropolitan Boston systems at the Carroll Water Treatment Plant raw water tap in Marlborough.

Fecal coliform levels tend to increase during the winter because, when water bodies near Wachusett ice over, waterfowl seek open water. Many roost at Wachusett, which tends to freeze later in the year than smaller ponds nearby. DCR has an active bird harassment program to move the birds away from the intake area.

Twenty of the 22 samples were positive during November. None of the samples exceeded a count of 20 cfu/100ml.

For the current six-month period, 0.0% of the samples have exceeded a count of 20 cfu/100ml.

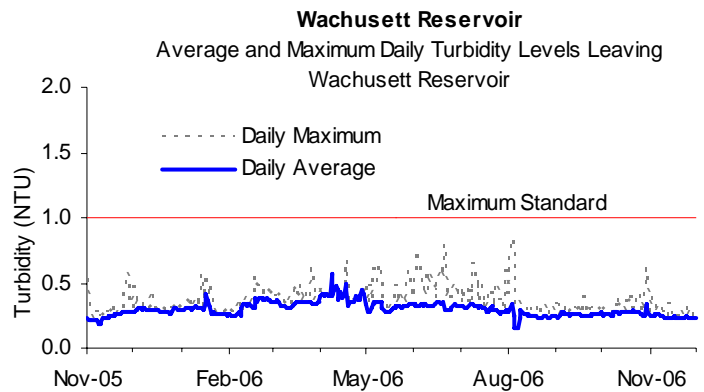
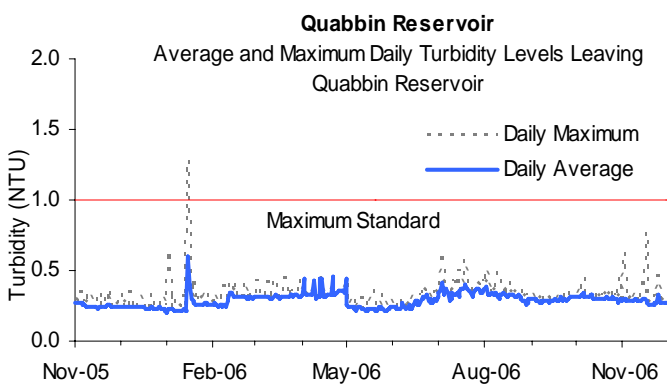


# Source Water – Turbidity and Algae Results November 2006

## Source Water – Turbidity Results

Turbidity is a measure of suspended and colloidal particles including clay, silt, organic and inorganic matter, algae and microorganisms. The effects of turbidity depend on the nature of the matter that causes the turbidity. High levels of particulate matter may have a higher chlorine demand or may protect bacteria from the disinfectant effects of chlorine, thereby interfering with the disinfectant residual throughout the distribution system.

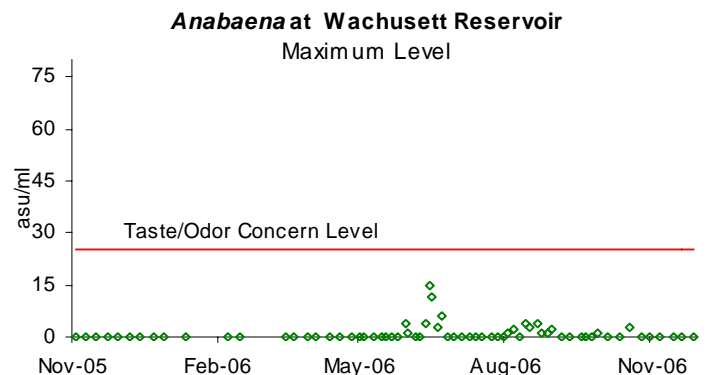
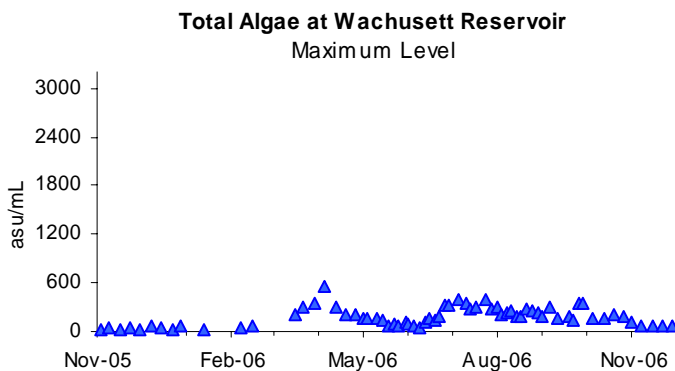
Samples for turbidity from Quabbin Reservoir are collected at the Ware Disinfection Facility before chlorination. Samples from Wachusett Reservoir are taken at the Carroll Water Treatment Plant inlet (raw water line) before treatment. The Massachusetts Department of Environmental Protection standard for source water turbidity for unfiltered water supply systems is a maximum of 1.0 NTU; the EPA standard is a maximum of 5.0 NTU. Maximum turbidity results at Quabbin and Wachusett were within DEP standards for the month.



## Source Water – Algae Levels

Algal levels in Wachusett Reservoir are monitored by DCR and MWRA. These levels, along with taste and odor complaints, are used to make decisions on source water treatment for algae control. Taste and odor complaints at the tap may be due to algae, which originate in source reservoirs, typically in trace amounts. Occasionally, a particular species grows rapidly, increasing its concentration in water. When *Synura*, *Anabaena*, or other nuisance algae blooms, MWRA may treat the reservoir with copper sulfate, an algacide.

Algal levels are currently low and no nuisance algae are present above trigger levels for November.



# Treated Water – Disinfection Results

## November 2006

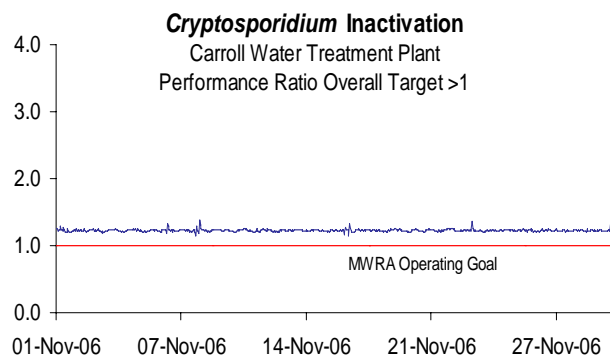
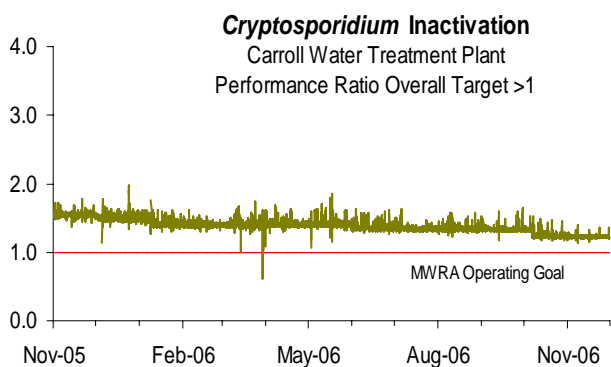
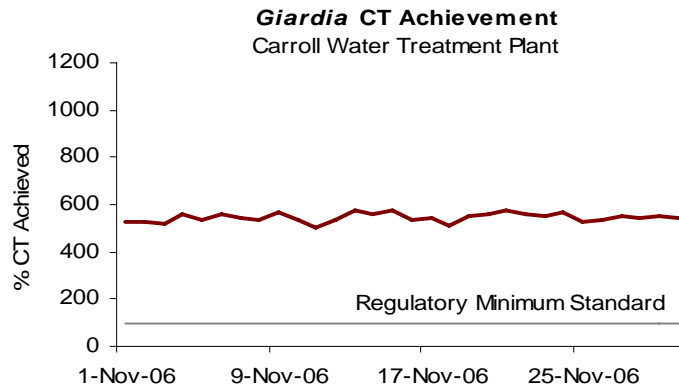
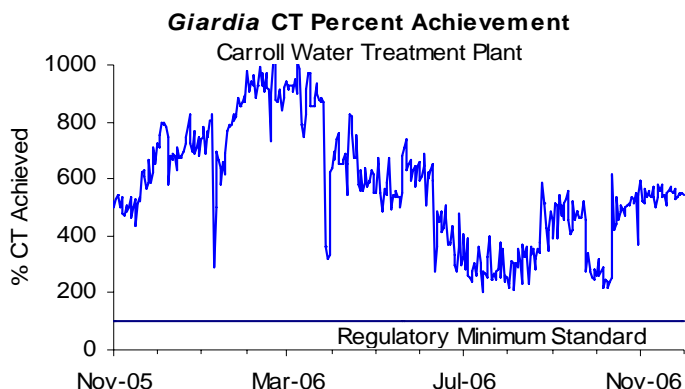
### Treated Water - Primary Disinfection

With the activation of the Carroll Water Treatment Plant, MWRA now reports on both regulatory required 99.9% inactivation for *Giardia*, and our voluntary operating goal of 99% inactivation for *Cryptosporidium*. The concentration (C) of the disinfectant over time (T) yields a measure of the effectiveness of disinfection. CT achievement for *Giardia* assures CT achievement for viruses, which have a lower CT requirement. The required CT for ozonated water varies with water temperature. MWRA calculates hourly CT inactivation rates and reports daily CT inactivation rates at maximum flow, as specified by EPA regulations.

### Wachusett Reservoir – MetroWest/MetroBoston Supply:

*Cryptosporidium* inactivation is reported as Performance Ratio (PR) to avoid confusion with the regulatory requirements. A PR of 1 demonstrates inactivation of 99% of *Cryptosporidium* based on site-specific data. PR was maintained above 1 at all times the plant was providing water into the distribution system. CT calculation for *Giardia* is conservative; subsequently, more inactivation occurs than is being reported. Compliance with the *Giardia* standard is expressed as percent of required CT achieved; 100% is the minimum allowed. On November 1, Train A was shut down, isolated, dechlorinated and drained to allow maintenance and other work to be completed. On November 30, MWRA began filling Train A. It will be disinfected using American Water Works Association standards before being placed back into service. CT was met each day in November, as well as every day for the last year.

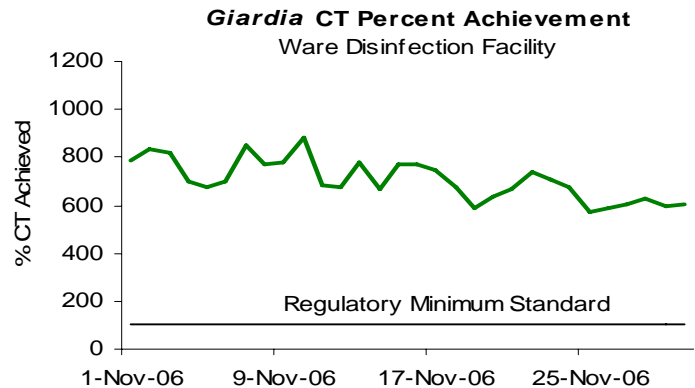
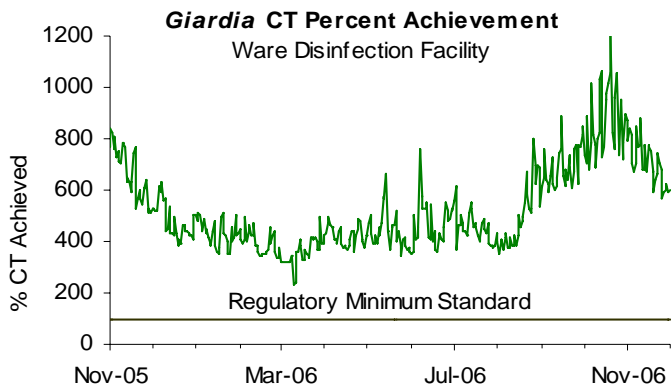
Ozone dose at Carroll Water Treatment Plant varied between 2.1 to 2.5 mg/L for November.



# Treated Water – Disinfection, pH and Alkalinity Results November 2006

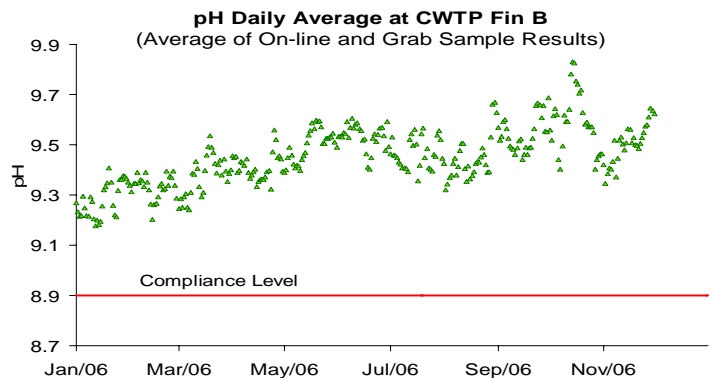
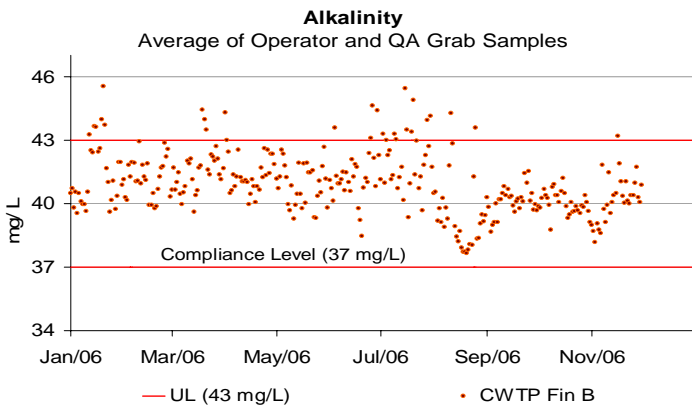
## Quabbin Reservoir at Ware Disinfection Facility (CVA Supply):

Chlorine dose remained at 1.3 mg/L. CT was met each day in November, as well as every day for the last year.



## pH and Alkalinity Compliance:

MWRA adjusts the alkalinity and pH of Wachusett water to reduce its corrosivity to minimize the leaching of lead and copper from service lines and home plumbing systems into the water. MWRA's target for distribution system pH is 9.3 and alkalinity is 40 mg/l. Per DEP requirements, daily samples from Carroll Water Treatment Plant (CWTP) Fin B site have a minimum compliance level of 8.9 for pH and 37 mg/L for alkalinity. In addition, quarterly samples from 27 distribution system taps have a minimum compliance level of 8.8 for pH and 37 mg/L for alkalinity. For no more than nine days in a six-month period may results be below these levels. Quality Assurance and operator staff test pH and alkalinity daily at CWTP Fin B. Distribution system samples are collected March, June, September, and December. In November and over the past six months, no sample results were below the target levels.



## Bacteria & Chlorine Residual Results for Communities in MWRA Testing Program November 2006

While all communities collect bacteria samples for the Total Coliform Rule (TCR), 39 systems (including Deer Island and Westboro State Hospital) use MWRA's Laboratory for TCR compliance testing. These systems collect samples for bacteriological analysis and measure water temperature and chlorine residual at the time of collection. The other ten MWRA customer communities (including Lynn's GE plant) have their samples tested elsewhere and these towns should be contacted directly for their monthly results.

There are 141 sampling locations for which MWRA is required to report TCR results. These locations include a subset of the community TCR locations, as well as sites along MWRA's transmission system, water storage tanks and pumping stations.

The Safe Drinking Water Act (SDWA) requires that no more than 5% of all samples may be total coliform positive in a month (or that no more than one sample be positive when less than 40 samples are collected each month). Public notification is required if this standard is exceeded.

*Escherichia coli* (*E.coli*) is a specific coliform species that is almost always present in fecal material and whose presence indicates likely bacterial contamination of fecal origin. If *E. coli* are detected in a drinking water sample, this is considered evidence of a critical public health concern. Additional testing is conducted immediately and joint corrective action by DEP, MWRA, and the community is undertaken. Public notification is required if follow-up tests confirm the presence of *E. coli* or total coliform. MWRA considers a disinfectant residual of 0.2 mg/L a minimum target level at all points in the distribution system.

### Highlights

Two of the 1,878 community samples (0.11%) system-wide tested positive for confirmed total coliform during the month of November. One of the 663 MWRA samples (0.15%) tested positive for confirmed total coliform. None of the samples tested positive for *E.coli*. All 39 systems that submitted chlorine residual data maintained an average disinfectant residual of at least 0.2 mg/L. Only 2.5% of the system samples had a disinfectant residual lower than 0.2 mg/L.

**TCR results by Community**

Town	Samples Tested for Coliform (a)	Total Coliform # (%) Positive	E.coli % Positive	Public Notification Required?	November 2006 Minimum Chlorine Residual (mg/L)	November 2005 Minimum Chlorine Residual (mg/L)	November 2006 Average Chlorine Residual (mg/L)	November 2005 Average Chlorine Residual (mg/L)
ARLINGTON	70	0 (0%)	0.0%		0.18	0.01	1.70	0.86
BELMONT	32	0 (0%)	0.0%		0.16	0.05	1.42	0.95
BOSTON	252	0 (0%)	0.0%		0.45	0.77	2.16	1.77
BROOKLINE	68	0 (0%)	0.0%		1.37	1.20	2.11	1.80
CHELSEA	40	0 (0%)	0.0%		1.60	0.93	1.97	1.81
DEER ISLAND	16	0 (0%)	0.0%		1.65	1.65	2.05	1.86
EVERETT	40	0 (0%)	0.0%		0.50	0.43	0.80	0.85
FRAMINGHAM	75	1 (1.33%)	0.0%	NO	0.24	0.05	1.65	1.40
LEXINGTON	45	0 (0%)	0.0%		1.16	0.63	2.15	1.67
LYNNFIELD	6	0 (0%)	0.0%		0.13	0.12	0.90	0.86
MALDEN	61	0 (0%)	0.0%		0.00	0.91	1.13	1.12
MARBLEHEAD	24	0 (0%)	0.0%		0.21	0.25	1.72	1.55
MARLBOROUGH (b)	52	0 (0%)	0.0%		0.09	0.23	1.82	1.28
MEDFORD	68	0 (0%)	0.0%		0.22	0.19	1.58	1.36
MELROSE	36	0 (0%)	0.0%		0.03	0.05	0.64	0.95
MILTON	32	0 (0%)	0.0%		0.86	0.17	1.42	1.18
NAHANT	10	0 (0%)	0.0%		0.02	0.05	1.43	0.83
NEEDHAM (b)	41	0 (0%)	0.0%		0.04	0.36	0.42	1.71
NEWTON	92	0 (0%)	0.0%		0.48	0.07	1.64	1.63
NORTHBOROUGH	16	0 (0%)	0.0%		0.08	0.08	1.00	0.96
NORWOOD	36	0 (0%)	0.0%		0.02	0.02	1.47	1.16
QUINCY	100	0 (0%)	0.0%		0.02	0.01	1.64	1.44
READING (b)	40	0 (0%)	0.0%		0.22	-	1.70	-
REVERE	65	0 (0%)	0.0%		1.08	0.55	1.77	1.34
SAUGUS	32	0 (0%)	0.0%		1.62	1.37	1.80	1.52
SOMERVILLE	100	0 (0%)	0.0%		0.02	0.03	1.79	1.58
SOUTH HADLEY FD1 (c)	17	0 (0%)	0.0%		0.25	-	0.03	-
SOUTHBOROUGH	11	0 (0%)	0.0%		0.18	0.15	1.19	0.66
STONEHAM	35	0 (0%)	0.0%		0.66	0.11	1.84	1.49
SWAMPSCOTT	18	0 (0%)	0.0%		0.01	0.03	1.06	0.90
WAKEFIELD (b)	55	0 (0%)	0.0%		0.37	0.17	1.47	1.21
WALTHAM	72	0 (0%)	0.0%		0.02	0.01	1.35	1.18
WATERTOWN	50	0 (0%)	0.0%		0.04	0.08	1.39	0.91
WELLESLEY (b)	36	0 (0%)	0.0%		0.21	0.02	0.61	0.69
WESTBORO HOSPITAL	5	0 (0%)	0.0%		0.22	0.95	1.13	1.53
WESTON	16	0 (0%)	0.0%		0.08	0.77	1.60	1.42
WINCHESTER (b)	20	0 (0%)	0.0%		0.03	0.04	0.79	0.58
WINTHROP	24	0 (0%)	0.0%		0.20	0.17	1.75	1.48
WOBBURN (b)	70	1 (1.43%)	0.0%	NO	0.07	0.07	0.62	0.73
<b>Total:</b>	<b>1878</b>	<b>2 (0.11%)</b>						
MASS. WATER RESOURCES AUTHORITY (d)	663	1 (0.15%)	0.0%	NO	0.03	0.02	1.94	1.68

(a) The number of samples collected depends on the population served and the number of repeat samples required.

(b) These communities are partially supplied, and may mix their chlorinated supply with MWRA chloraminated supply.

(c) Part of the Chicopee Valley Aqueduct System. Free chlorine system.

(d) MWRA sampling program includes a subset of community TCR sites as well as sites along the transmission system, tanks and pumping stations. Some MWRA TCR sites which are entry points to the community had low chlorine residuals due to various reasons.

# Treated Water - Disinfection By-Product (DBP) Levels in Communities

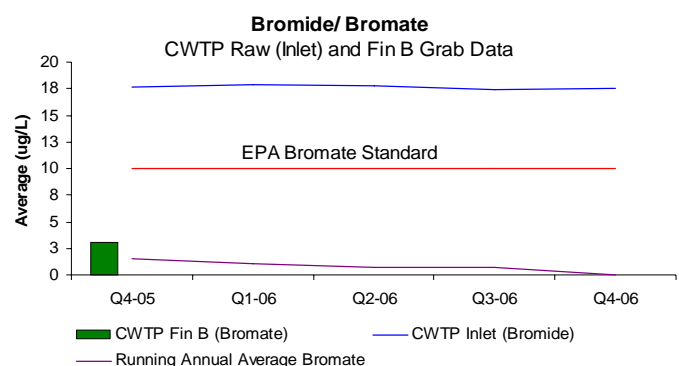
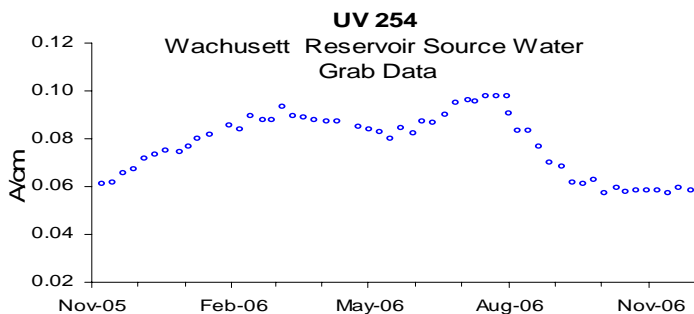
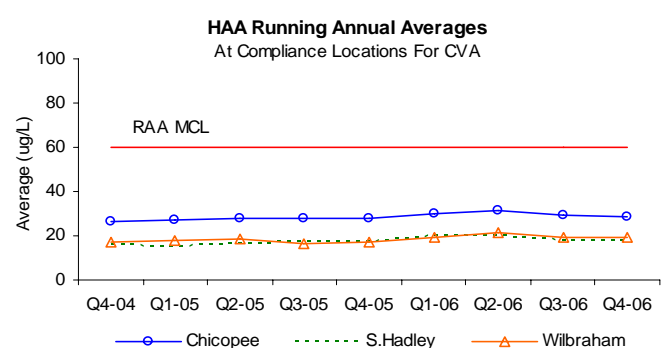
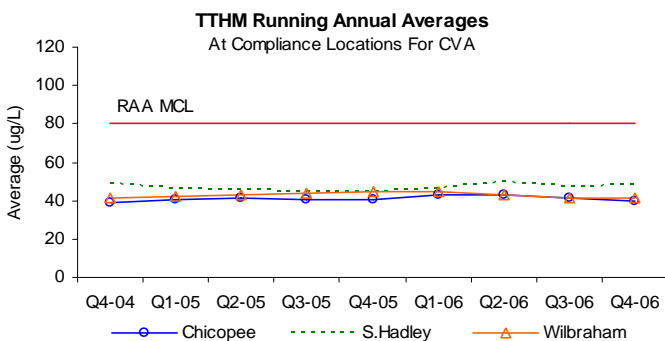
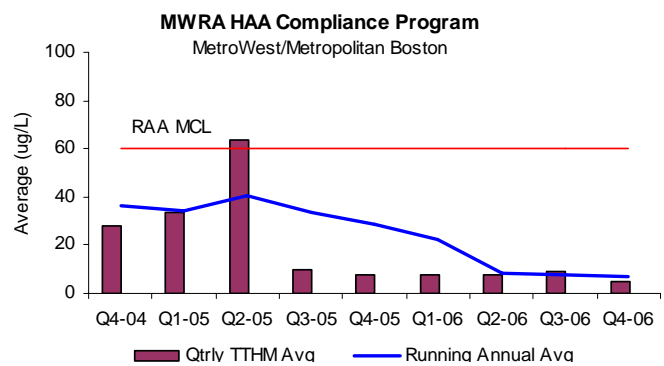
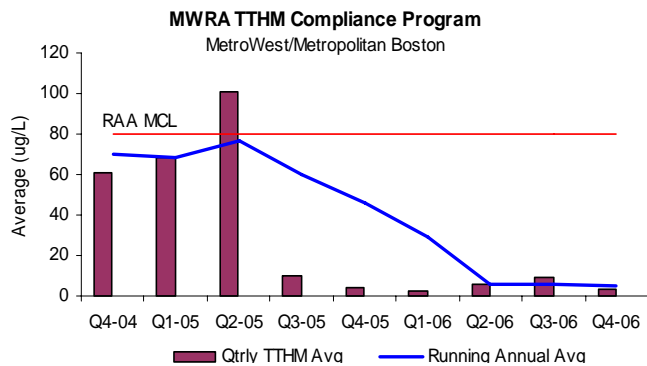
## November 2006

Total Trihalomethanes (TTHMs) and Haloacetic Acids (HAA5s) are by-products of disinfection treatment with chlorine. Chlorination levels, the presence of organic precursors, pH levels, the contact time of water with chlorine used for disinfection, and temperature all affect TTHM and HAA5 levels. DBPs are of concern due to their potential adverse health effects at high levels. EPA's running annual average (RAA) standards are 80 ug/L for TTHMs and 60 ug/L for HAA5. This was implemented July 2005. DEP requires that compliance samples be collected quarterly; MWRA samples more frequently at some locations. Partially served communities are responsible for their own compliance monitoring and reporting and must be contacted directly for their results.

Absorbance, measured as UV-254, is a surrogate measure of reactive organic matter. Regulated DBP levels have dropped to very low levels with Carroll Water Treatment Plant (CWTP) coming on-line. However, UV-254 levels remain useful for estimating ozone dosage and serving as a trigger for Quabbin transfer consideration.

Bromate is tested monthly per DEP requirements for water systems that treat with ozone. Bromide in the raw water may be converted into bromate following ozonation. EPA's RAA Maximum Contaminant Level (MCL) standard for bromate is 10 ug/L.

The RAA for TTHMs and HAA5s at compliance locations (represented as the line in the top two graphs below) remained below current standards. HAA5 and TTHM levels at all sampling locations for MetroWest/Metropolitan Boston communities have declined dramatically since August 2005 following activation of the Carroll Water Treatment Plant which uses ozone, rather than chlorine for primary disinfection. With four quarters of results from CWTP, the RAA for TTHMs = 5.1 ug/L; HAA5s = 7.2 ug/L. CVA's DBP levels continue to be below the standards. UV-254 levels are currently around 0.06 A/cm. The RAA for Bromate = 0.0 ug/L, and the quarterly results for bromate did not exceed the standard.





# MWRA Monthly Water Quality Analysis

## November 2006

This page provides information on water quality at five locations in the MWRA transmission system. Results reflect a "snapshot" in time and may not represent typical conditions. Monitoring for parameters indicated in bold is quarterly as they either have minimal variability or are always below detection limits. The "Wachusett System" locations represent: raw water from the Wachusett Reservoir (CWTP inlet), finished water leaving the treatment plant (CWTP Finished water tap), and a location at an endpoint in the main transmission system (Shaft 9A, Malden).

Component	CVA System		Wachusett System			Standards	Units	Exceedance
	Quabbin Res. at Ware Disinfection Facility (Raw)	Ludlow Monitoring Station (Treated)	Carroll Water TP Inlet (Raw) <sup>1</sup>	Carroll Water TP Fin. Water Tap (Treated) <sup>1</sup>	Shaft 9A, Malden (Treated)			
Alkalinity	<b>2.7</b>	<b>3.3</b>	<b>5.7</b>	<b>39.0</b>	<b>40.3</b>		MG/L	
Aluminum	< 15.0	< 15.0	< 15.0	< 15.0	< 15.0	50-200 (e)	UG/L	NO
Ammonia-N	0.01	< 0.01	<b>0.01</b>	<b>0.62</b>	<b>0.61</b>		MG/L	
Antimony	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	6 (a)	UG/L	NO
Arsenic	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	10 (a)	UG/L	NO
Barium	7.1	7.8	9.2	9.0	9.6	2000 (a)	UG/L	NO
Beryllium	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	4 (a)	UG/L	NO
Bromate	< 2.5	<b>&lt; 2.5</b>	<b>&lt; 2.5</b>	<b>&lt; 2.5</b>	<b>&lt; 2.5</b>	10 (a)	UG/L	NO
Bromide	9.5	<b>5.7</b>	<b>17.4</b>	<b>17.5</b>	<b>18.1</b>		UG/L	
Cadmium <sup>(1)</sup>	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	5 (a)	UG/L	NO
Calcium	2070	2220	4750	4680	4870		UG/L	
Chloride	<b>7.8</b>	<b>9.3</b>	<b>23.0</b>	<b>24.9</b>	<b>25.5</b>	250 (e)	MG/L	NO
Chlorine, Free	NA	<b>0.68</b>	NA	<b>0.03</b>	<b>0.09</b>	4 (c)(d)	MG/L	NO
Chlorine, Total	NA	NA	NA	<b>2.7</b>	<b>2.3</b>	4 (c)(d)	MG/L	NO
Chromium	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	100 (a)	UG/L	NO
Coliform, Fecal, MF Method	<b>0</b>	NA	<b>1</b>	NA	NA	20 (b)	CFU/100 mL	NO
Coliform, Total, MF Method (h)	<b>7</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	100 (b) 0 (c)	CFU/100 mL	NO
Copper **	< 3.0	< 3.0	<b>&lt; 3.0</b>	<b>&lt; 3.0</b>	<b>5.6</b>	1300 (f) 1000 (g)	UG/L	NO
Cyanide	< 0.01	<b>&lt; 0.01</b>	<b>&lt; 0.01</b>	<b>&lt; 0.01</b>	<b>&lt; 0.01</b>	0.2 (a)	MG/L	NO
Fluoride	< 0.02	< 0.02	0.03	1.05	1.01	4 (a)	MG/L	NO
Hardness <sup>(2)</sup>	7.3	7.6	15.6	15.5	15.8		MG/L	
Iron **	11.6	11.5	<b>22.1</b>	<b>24.6</b>	<b>112.0</b>	300 (e)	UG/L	NO
Lead	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2	15 (f)	UG/L	NO
Magnesium	504	516	909	905	876		UG/L	
Manganese	4.7	3.3	<b>9.7</b>	<b>9.3</b>	<b>17.8</b>	50 (e)	UG/L	NO
Mercury <sup>(1)</sup>	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	2 (a)	UG/L	NO
Nickel	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0		UG/L	
Nitrate-N	< 0.005	< 0.005	<b>0.087</b>	<b>0.092</b>	<b>0.096</b>	10 (a)	MG/L	NO
Nitrite	< 0.005	< 0.005	<b>&lt; 0.005</b>	<b>&lt; 0.005</b>	<b>0.005</b>	1 (a)	MG/L	NO
Orthophosphate	0.007	0.007	<b>0.004</b>	<b>0.006</b>	<b>0.007</b>		MG/L	
pH	<b>6.4</b>	<b>6.9</b>	<b>7.0</b>	<b>9.3</b>	<b>9.5</b>		S.U.	
Potassium	478	469	942	960	933		UG/L	
Selenium	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	50 (a)	UG/L	NO
Silica (SiO <sub>2</sub> )	<b>2240</b>	2220	<b>3290</b>	<b>3680</b>	<b>3690</b>		UG/L	
Silver	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	100 (e)	UG/L	NO
Sodium	4.9	5.8	13.7	31.2	29.9		MG/L	
Specific Conductance	<b>49</b>	<b>54</b>	<b>119</b>	<b>196</b>	<b>196</b>		UMHO/cm	
Standard Plate Count, HPC (48 Hrs @ 35C)	NA	NA	<b>18</b>	<b>4</b>	<b>3</b>	500 (c)	CFU/mL	NO
Sulfate (SO <sub>4</sub> )	<b>4.9</b>	5.0	<b>7.1</b>	<b>8.2</b>	<b>8.2</b>	250 (e)	MG/L	NO
Thallium	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	2 (a)	UG/L	NO
Total Dissolved Solids	<b>35.0</b>	27.0	<b>66.0</b>	<b>92.0</b>	<b>99.0</b>	500 (e)	MG/L	NO
Total Organic Carbon	<b>1.7</b>	2.0	<b>2.0</b>	2.4	<b>2.0</b>		MG/L	
Total Phosphorus	0.006	0.007	0.010	0.009	0.009		MG/L	
UV-254	<b>0.025</b>	0.022	<b>0.058</b>	0.037	0.037		A/cm	
Zinc **	3.3	2.6	<b>&lt; 1.5</b>	<b>&lt; 1.5</b>	<b>3.7</b>	5000 (e)	UG/L	NO

(a) = Primary MCL standard (health related). DEP "Drinking Water Regulations", 310CMR 22.00.

(b) = Primary MCL standard (health related), applies to source (raw) water only. DEP "Drinking Water Regulations", 310CMR 22.00.

(c) = Primary MCL standard (health related). DEP "Drinking Water Regulations", 310CMR 22.00. Applies to samples of treated water downstream of Wachusett and Quabbin Reservoirs.

(d) = Maximum Residual Disinfectant Level. DEP "Drinking Water Regulations", 310CMR 22.00.

(e) = Secondary MCL standard (aesthetic related). DEP "Drinking Water Regulations", 310CMR 22.00.

(f) = Refers to 90th percentile Action Level

(g) = Refers to a single sample, secondary MCL

(h) = Confirmed results only are reported

MCL = Maximum Contaminant Level

CFU = Colony Forming Unit

S.U. = Standard Units

UG/L = micrograms per liter = parts per billion

NA = Not Applicable

NTU = Nephelometric Turbidity Unit

MG/L = milligrams per liter = parts per million

< = less than method detection limit

HPC = Heterotrophic Plate Count

Inv Res = Invalid sample result

\*\* = Metal results may be elevated due to local plumbing at the sample tap.

**Bold Italics = November samples**

Regular Font = Quarterly Samples from October

Most results are based on single grab samples collected on November 6, 7 and 14 of 2006 and analyzed by MWRA and contract laboratories.

### NOTES:

(1) MWRA tests for cadmium and mercury are more sensitive than the EPA-set levels of detection and reporting. For cadmium any level below 1.0 ug/L and for mercury any level below 0.2 ug/L are under the EPA minimum detection limits. MWRA will continue to report any result below these detection limits here in the monthly report but will follow EPA reporting requirements and not report them in the EPA-regulated annual Consumer Confidence Report.

(2) MWRA water is considered soft. Water is measured by hardness - which is the amount of dissolved minerals in the water. MWRA water has a hardness of about 15-20 mg/l or about 1 grain/gallon (1 grain/gallon = 17.1 mg/L). For comparison, hard water would have greater than 75 mg/l hardness.

# Special Update on Lead and Copper Sampling for 2006

## Continued Good News on Lead Levels

The most recent sampling round, once again, meets the Lead Action Level. Results from lead and copper samples collected in September 2006 show that ninety-two percent of the targeted high-risk homes had lead levels equal to or below the Lead Action Level (AL) of 15 parts per billion (ppb), meeting the requirement of at least 90 percent. The 90th percent value was 12.5 ppb. MWRA, as a system, has met six straight rounds, and over the last five years, 9 of the last 11 sampling rounds.

Even though MWRA as a system met the Lead Action Level, some homes may still have elevated levels in stagnant water due to household plumbing. Concerned users should let their water run until after it is cold. For more information please visit [www.mwra.com](http://www.mwra.com).

## Background

MWRA source waters contain virtually no lead, but lead can leach from lead service pipes connecting homes to water mains and from lead solder and brass and chrome-plated brass fixtures in homes. In 1991, EPA issued the Lead & Copper Rule which set action levels of 15 ppb for lead and 1,300 ppb for copper, and required that 90 percent or more of targeted high-risk homes be below that level. The samples must be first flush samples taken at homes and locations most likely to have high levels of lead after the water has sat stagnant overnight.

In 1996, MWRA began to add sodium carbonate and carbon dioxide to the water to make it less corrosive. Lead levels dropped significantly after this change in treatment, but still did not consistently meet the standard. Since 2002, MWRA has adjusted the corrosion control process by fine-tuning the pH and alkalinity levels, with further optimization in 2006 after the ozone plant had come online. MWRA continues to work so that the service area will consistently be below the 15-ppb Action Level.

## Current Results

The September 2006 data showed that 92.0% percent of the targeted high-risk homes had lead levels below the Action Level, meeting the target of 90 percent. The 90th percentile of lead results was 12.5 ppb, meeting the 15-ppb standard. Figure 1 shows the over 80% reduction in lead levels since 1992. The 90th percentile for copper was 132 ppb, compared with the Action Level of 1,300 ppb. MWRA has always been in compliance with the Copper Action Level.

