MASSACHUSETTS WATER RESOURCES AUTHORITY

WATER QUALITY UPDATE

An Analysis of November 2001 Sampling Data

This is a monthly report containing information about the quality of water supplied by MWRA. We hope this report is useful to you as a local water supplier, public health official, water consumer or observer of MWRA' s system performance. It provides a more detailed review of water quality than the annual water quality report that is mailed each June to every customer in our service area. To view this annual report, please visit www.mwra.com/water/html/awqr.htm.

Indicators of Water Quality
MWRA routinely uses six general indicators of water quality:

- Microbial
- Corrosiveness (pH and alkalinity)
- Disinfection By-Products
- Turbidity & Algae
- Disinfectant Residual
- Mineral Analysis

Tests are conducted on water sampled at the source reservoirs (source or raw water) and also on water after treatment that is sampled from MWRA or community lines (treated water). A map on Page 2 indicates the location of reservoirs, treatment facilities, and service communities. Testing frequencies vary by parameter. The following pages contain information on all of the above indicators.

November 2001 Highlights

• **Bird harassment and observation at Wachusett Reservoir continued**. MDC staff continued activities that included weekend shifts, weekend harassment about 2 hours before sunset, and observation and harassment Monday through Friday from 8 AM to 3:30 PM. Boat-based harassment has been effective in keeping waterfowl away from Cosgrove Intake. Fecal coliform numbers at Cosgrove have been low. See Page 3 for details.

• **Construction of a small pilot plant for use in studying water treatment with ozone and UV disinfection is on schedule**. The facility will help MWRA staff to understand potential effects of these treatment technologies on distribution system pipes. In addition, the facility will be used to simulate and test operating conditions for the Walnut Hill Treatment Plant, and to train operators in working with this treatment approach. The plant is scheduled to be on-line in early 2002.

• **MWRA achieved CT disinfection requirements for the month** at both Ware Disinfection Facility (WDF) and Cosgrove Disinfection Facility (CDF). Chlorine dose at CDF was reduced from1.8 to 1.6 mg/L on 11/26. Levels of disinfection by-products (DBPs) were comparable to those in October. No town violated the Total Coliform Rule criteria. CT results appear on Page 5. DBP results appear on Page 7. TCR results are on Page 6.

• **Pipe break in Boston.** During preparation for the removal of an old blow off on Morton Street in Dorchester and the installation of a new blow off**,** a 2-3'section of pipe burst. This resulted in severe road damage and prompted the immediate isolation of Section 20. There was no service or water quality impact to the Boston area that it supplies. The road was shut down in both directions for several hours. Materials have been located to make timely repairs.

•**Lead Levels:** Lead and copper test results for September 2001 provided disappointing news. Only 88% of tested worst case homes met the lead action level, just below the 90% standard. The 90th percentile of lead results was 18.8 ug/L compared to the 15 ug/L level. See Page 9.

For more information, please contact MWRA at (617) 242-5323, or visit www.mwra.com
100 First Avenue, Charlestown Navy Yard, Boston, MA 02129.

For further information regarding health concerns, please contact
the Department of Public Health/Division of Epidemiology at (617) 983-6800
or Boston Public Health Commission at (617) 534-5611.

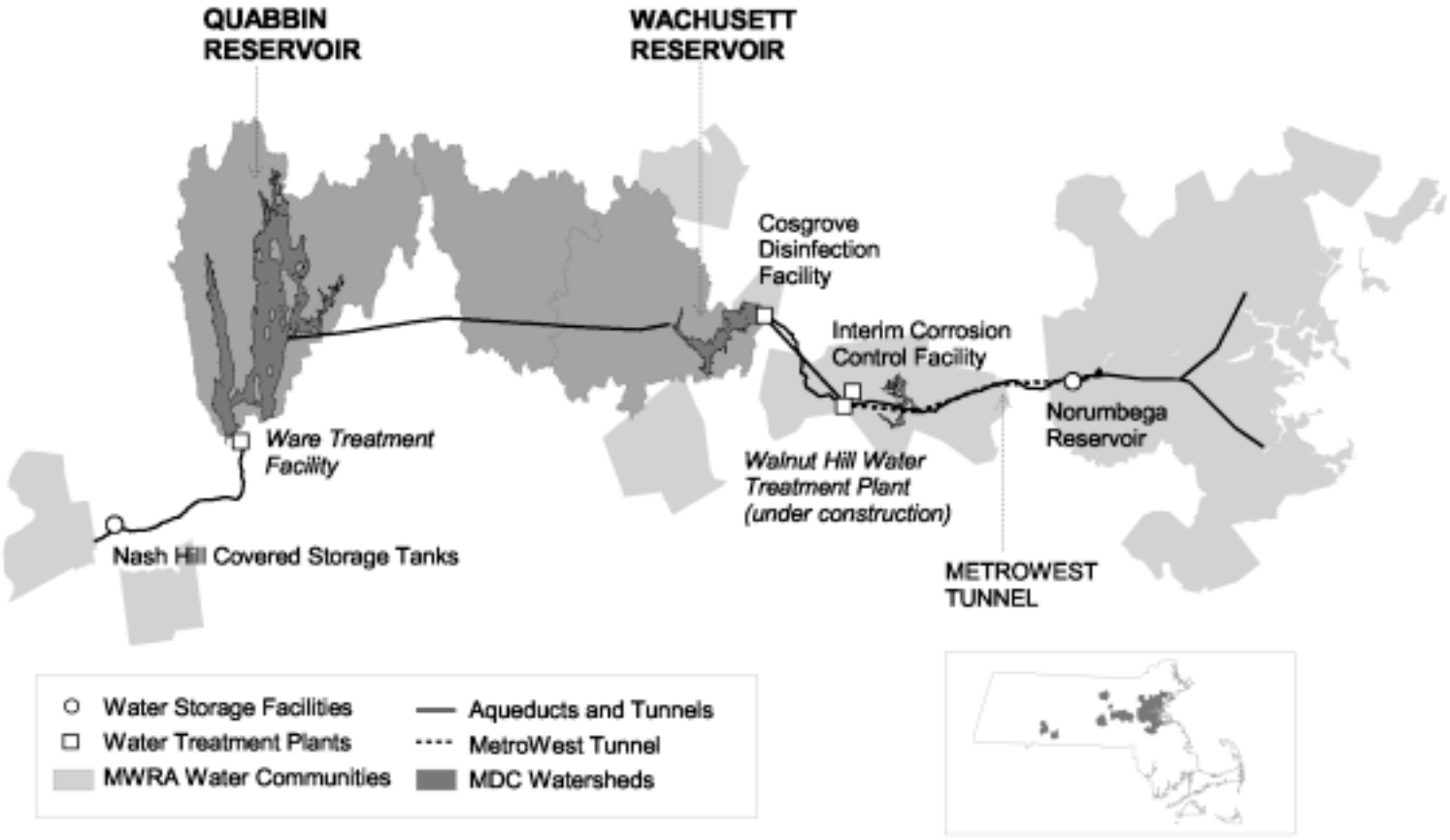
Release Date: December 20 2001

The Water System

MWRA provides about 250 million gallons of water each day to 46 cities and towns in Massachusetts. Each municipality is responsible for distributing the water within its own community. Thirty of the customer communities are fully supplied by MWRA. The other communities use MWRA water to augment their own supplies, either on a regular basis or in times of water shortage. 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, serving South Hadley Fire District #1, Chicopee, and Wilbraham. 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 Metropolitan District Commission (MDC), 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.



Federal Safe Drinking Water Act (SDWA)

The 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 provides testing services for many of the communities, and 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 2001

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 is a subclass of the coliform group which 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 any six-month period have over 20 fecal coliforms per 100ml.

Sample Site: Quabbin Reservoir
Quabbin Reservoir water is sampled at Winsor Dam before entering the CVA system.

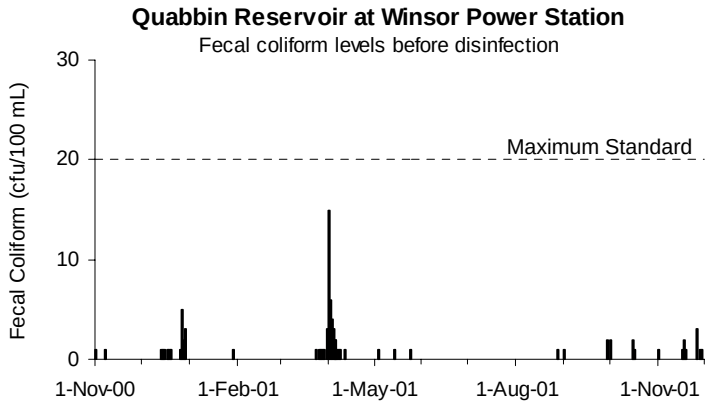
2 of 29 samples were positive during November. MWRA met the six-month running average standard for fecal coliform continuously at this location over the last year.

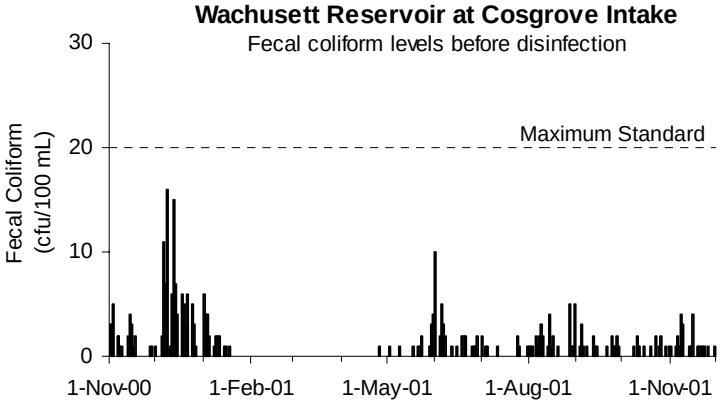
Sample Site: Wachusett Reservoir
Wachusett Reservoir water is sampled at Cosgrove Intake before entering the MetroWest and Metropolitan Boston systems. Fecal coliform levels tend to increase during the winter, when water bodies near Wachusett ice over and waterfowl seek open water. Many roost at Wachusett, which tends to freeze later in the year than smaller ponds nearby.

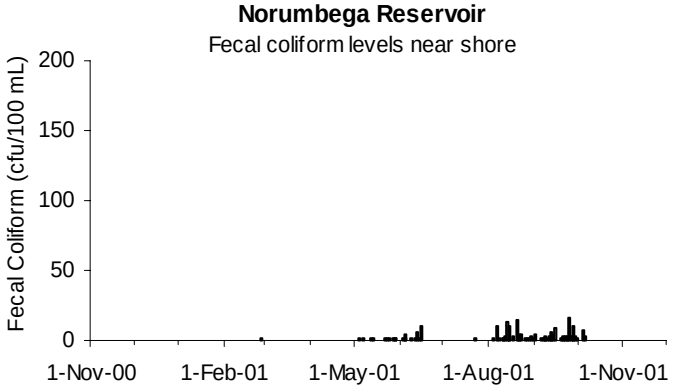
14 of 22 samples were positive for fecal coliform, but colony counts were low. MWRA also performs a screening test for total coliform which includes fecal and other environmental coliform. This test is rapid and simple, but the results are unconfirmed, or "presumptive". Additional testing is required to confirm that total coliform are present in the sample. Results from these tests trended up beginning in April, but most have not confirmed positive. MWRA staff are analyzing historical data, including results from 2001, to find a likely cause for the trend.

Sample Site: Norumbega Reservoir
Norumbega Reservoir in Weston receives flows from Wachusett for temporary storage each day during low demand hours, which are then discharged during high demand. Norumbega water is sampled from the shore near the gatehouse before disinfection. Coliform levels are elevated periodically, partly because samples collected from the shore of this small reservoir are more susceptible to local disturbances. Covered storage is scheduled to replace this open reservoir in 2004.

0 of 30 samples from water taken along the shore were positive for fecal coliform during November.





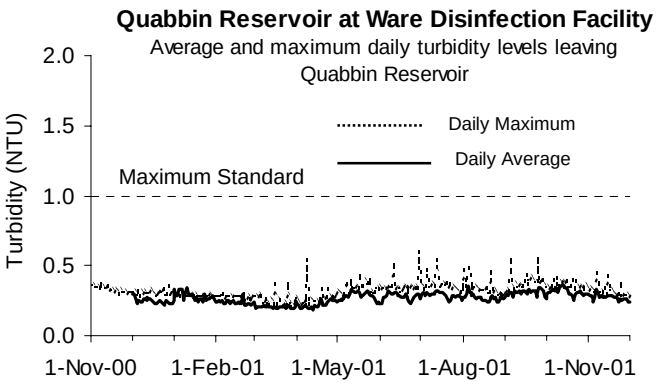


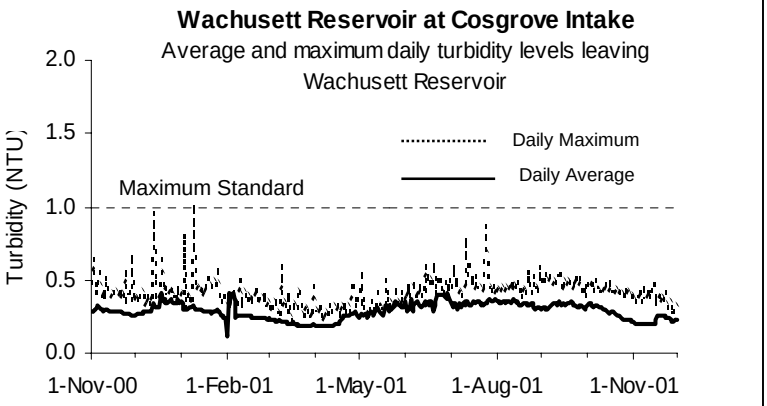
Source Water – Turbidity and Algae Results
November 2001

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.

Since December 2000, samples for turbidity from Quabbin Reservoir are collected at the Ware Disinfection Facility before chlorination. These samples represent reservoir water entering the CVA system. Samples are also taken at Cosgrove Intake, representing water quality before chlorination for source water serving the MetroWest and Metropolitan Boston systems. 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 Reservoir and at Wachusett Reservoir were within DEP standards for the month.

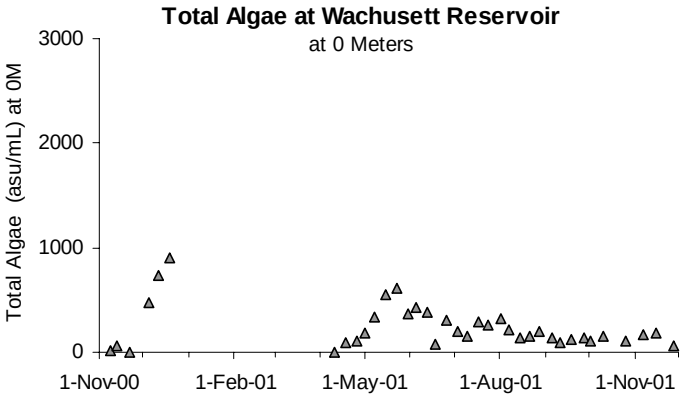


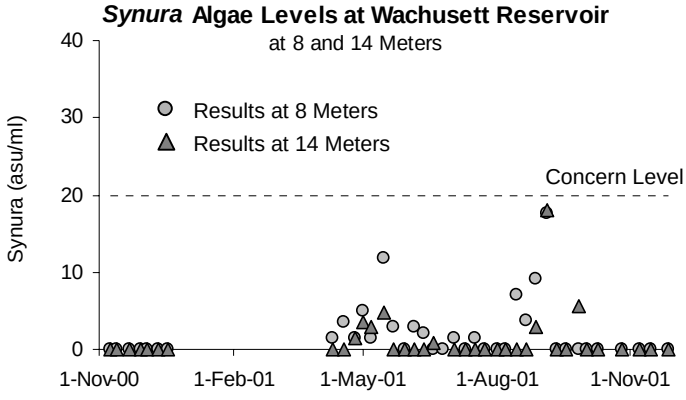


Source Water – Algae Results

Algal levels in reservoirs are monitored by MDC and MWRA. These results, along with taste and odor complaints, are used to make decisions on source water treatment for algae control.

Most taste and odor complaints at the tap are 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 alga blooms, MWRA treats the reservoirs with copper sulfate, an algaecide. MWRA treated Wachusett Reservoir for algae at about 20 foot depths on 9/5/01 in order to reduce levels of *Synura*. Levels for these algae have been very low since treatment. Of 69 complaints received during November from local water departments, 1 concerned taste and odor that may be due to algae.





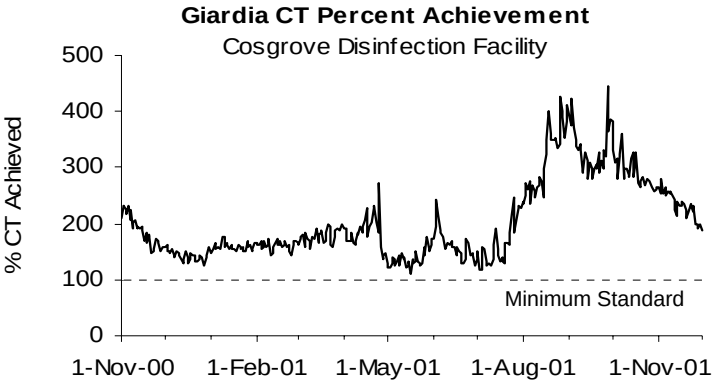
Treated Water – Disinfection and pH Results
October 2001

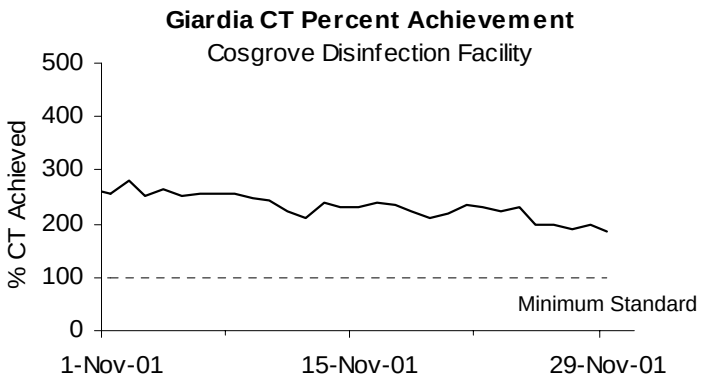
Treated Water - Primary Disinfection

Wachusett Reservoir at Cosgrove Disinfection Facility (MetroBoston Supply):

MWRA provides disinfection adequate to achieve EPA's requirement of 99.9% inactivation of *Giardia* cysts and 99.99% inactivation of viruses in drinking water using a calculation based on three sample points that DEP approved in June, 1999. CT achievement for *Giardia* assures CT achievement for viruses, which have a lower CT requirement. The concentration (C) of the disinfectant in the water over time (T) yields a measure of the effectiveness of disinfection, CT. The required CT varies with disinfectant type, water temperature, pH, and other factors. MWRA calculates daily CT inactivation rates at maximum flow, as specified by EPA regulations.

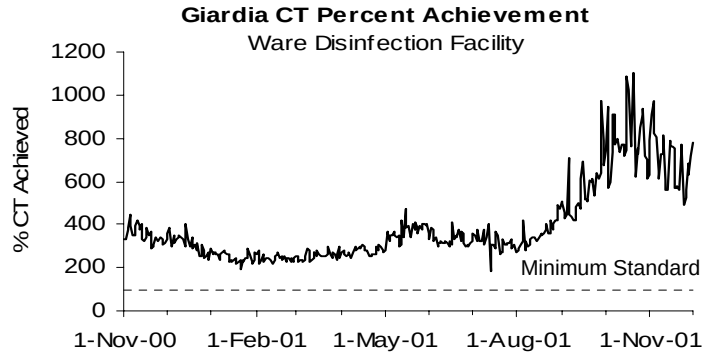
Chlorine dose was decreased from 1.8 mg/L to 1.6 mg/L on 11/26/01. CT was met each day in November, as well as every day for the last year.

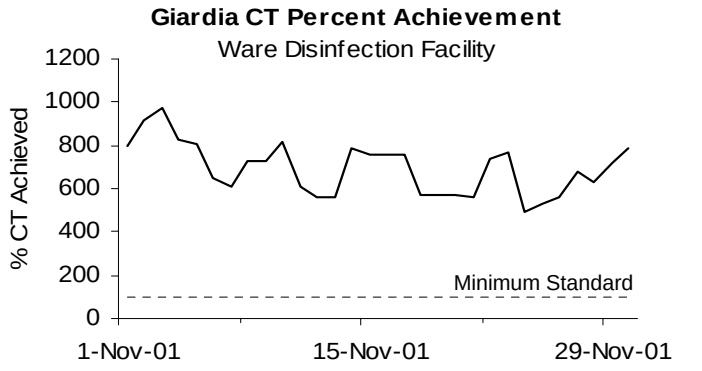




Quabbin Reservoir at Ware Disinfection Facility (CVA Supply):

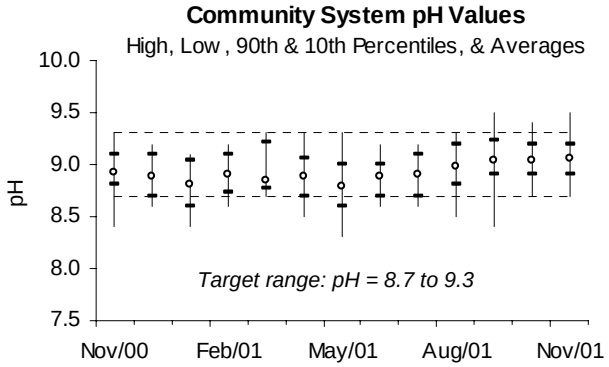
CT was met each day in November, as well as every day since reporting began in August, 2000.





Treated Water – pH Results

MWRA adjusts the alkalinity and pH of Wachusett water to reduce its corrosivity in order to minimize the leaching of lead and copper from service lines and home plumbing systems into the water. MWRA targets distribution system pH levels between 8.7 and 9.3 to minimize leaching of lead. In order to maintain these levels this summer, the target pH at Shaft 4 increased from 9.3 to 9.4 on 6/1 to counter a seasonal downward drift of pH levels in the distribution system. MWRA staff collects and analyzes samples for pH from 26 community locations on a biweekly schedule to measure pH levels.



Bacteria & Chlorine Residual Results for Communities in MWRA Testing Program
November 2001

Background

While all communities collect bacteria samples for the TCR, 36 cities and towns (including Westboro State Hospital) use the MWRA Laboratory for Total Coliform Rule compliance testing. These communities collect samples for bacteriological analysis and measure water temperature and chlorine residual at the time of collection. Cambridge conducts their own monitoring. The other 9 MWRA customer communities have their samples tested elsewhere and these towns should be contacted directly for their monthly results.

The SDWA requires that no more than 5% of all samples may be total coliform positive in a month (or that no more than 1 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

One of the 1723 samples (0.1% system-wide) tested positive for confirmed total coliform during the month of November. No samples tested positive for *E. coli*. No town failed the TCR rule for the month.

All of the thirty-five communities that submitted chlorine residual data maintained an average disinfectant residual of at least 0.2 mg/L. Thirteen communities had one or more samples with 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 2001 Minimum Chlorine Residual (mg/L)	November 2000 Minimum Chlorine Residual (mg/L)	November 2001 Average Chlorine Residual (mg/L)	November 2000 Average Chlorine Residual (mg/L)
ARLINGTON	70	0 (0%)	0.0%		0.06	0.09	1.16	1.20
BELMONT	32	0 (0%)	0.0%		0.20	0.10	0.98	1.04
BOSTON	241	1 (.41%)	0.0%		0.71	0.33	1.72	1.74
BROOKLINE	68	0 (0%)	0.0%		0.30	0.70	1.46	1.81
CHELSEA	32	0 (0%)	0.0%		0.43	1.01	1.39	1.62
EVERETT	40	0 (0%)	0.0%		1.10	0.70	1.58	1.45
FRAMINGHAM (c)	72	0 (0%)	0.0%		0.10	0.26	1.43	1.39
LEXINGTON	36	0 (0%)	0.0%		1.17	0.80	1.72	1.60
LYNNFIELD	6	0 (0%)	0.0%		0.31	0.17	0.92	1.12
MALDEN	60	0 (0%)	0.0%		0.07	0.03	1.16	1.21
MARBLEHEAD	24	0 (0%)	0.0%		0.33	0.35	1.35	1.45
MARLBOROUGH (b)(c)	47	0 (0%)	0.0%		0.15	0.52	1.57	1.23
MEDFORD	68	0 (0%)	0.0%		0.30	0.3	1.27	1.13
MELROSE	36	0 (0%)	0.0%		0.10	0.10	1.29	1.21
MILTON	32	0 (0%)	0.0%		0.78	0.70	1.32	1.35
NAHANT	10	0 (0%)	0.0%		0.03	0.00	1.01	0.79
NEEDHAM (b)	41	0 (0%)	0.0%		0.04	0.01	1.20	0.28
NEWTON	88	0 (0%)	0.0%		0.61	1.06	1.46	1.55
NORTHBOROUGH	14	0 (0%)	0.0%		0.75		1.70	
NORWOOD	40	0 (0%)	0.0%		0.05	0.05	0.80	0.83
QUINCY	92	0 (0%)	0.0%		0.10	0.10	1.67	1.43
REVERE	65	0 (0%)	0.0%		0.99	0.56	1.58	1.55
SAUGUS	32	0 (0%)	0.0%		1.40	1.50	1.50	1.67
SOMERVILLE	80	0 (0%)	0.0%		0.40	0.30	1.24	1.35
SOUTHBOROUGH (c)	11	0 (0%)	0.0%		0.30	0.30	1.06	0.84
STONEHAM	35	0 (0%)	0.0%		1.24	1.34	1.66	1.70
SWAMPSCOTT	18	0 (0%)	0.0%		1.22	0.61	1.59	1.21
WAKEFIELD (b)	55	0 (0%)	0.0%		0.40	0.43	1.47	1.44
WALTHAM	68	0 (0%)	0.0%		0.10	0.20	1.51	1.49
WATERTOWN	50	0 (0%)	0.0%		0.50	0.80	1.35	1.37
WELLESLEY (b)	36	0 (0%)	0.0%		0.15	0.20	0.38	0.36
WESTBORO HOSPITAL	4	0 (0%)	0.0%					
WESTON (c)	18	0 (0%)	0.0%		0.23	0.40	1.03	1.21
WINCHESTER (b)	20	0 (0%)	0.0%		0.05	0.08	0.70	0.55
WINTHROP	24	0 (0%)	0.0%		0.50	0.80	1.40	1.40
WOBURN (b)	58	0 (0%)	0.0%		0.03	0.00	0.53	0.57
Total:	1723	1 (0.1%)						

(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) These communities chloraminate

Treated Water - Disinfection By-Product (DBP) Levels in Communities
November 2001

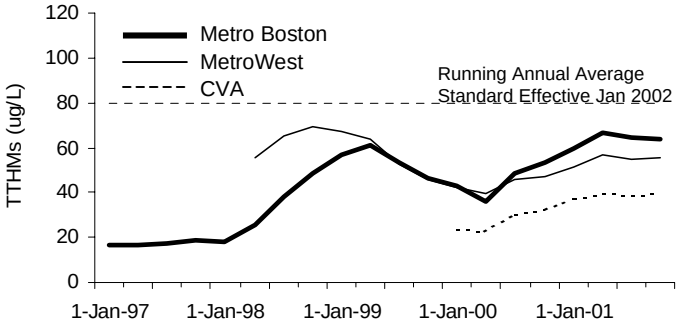
Total Trihalomethanes (TTHMs) and Haloacetic Acids (HAAs) are by-products of disinfection treatment with chlorine. Chlorination levels, the presence of organic precursors, pH levels, the contact time of water with chlorine used for disinfection, and temperature all affect TTHM and HAA levels. DBPs are of concern due to their potential adverse health effects at high levels. EPA recently established new running annual average standards of 80 ug/L for TTHMs and 60 ug/L for HAA 5 that take effect January 2002. DEP requires that compliance samples be collected quarterly. MWRA samples weekly at some locations, monthly and quarterly at others. **Metro Boston numbers are used for compliance purposes;** results presented below from CVA and MetroWest sampling sites enable MWRA staff to monitor control of MWRA treatment processes. Individual CVA and MetroWest communities are responsible for their own compliance monitoring and reporting. They must be contacted directly for their results.

Monthly TTHM and HAA5 levels at all process control sampling locations are similar to those of last year in all regions. The running annual average for TTHMs at compliance locations, represented in the graphs at the top of the page, remained below both current and future standards.

TOTAL TRIHALOMETHANES

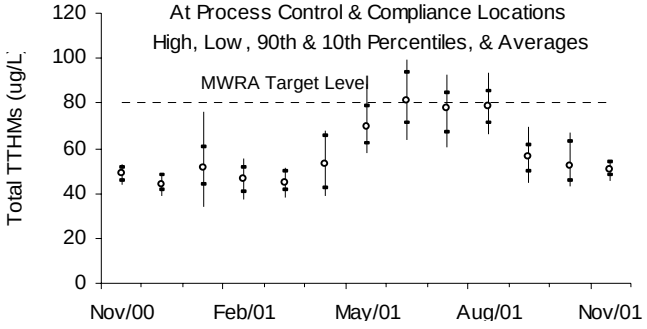
TTHM Running Annual Averages

At Compliance Locations For CVA, MetroWest, and Metro Boston Sites



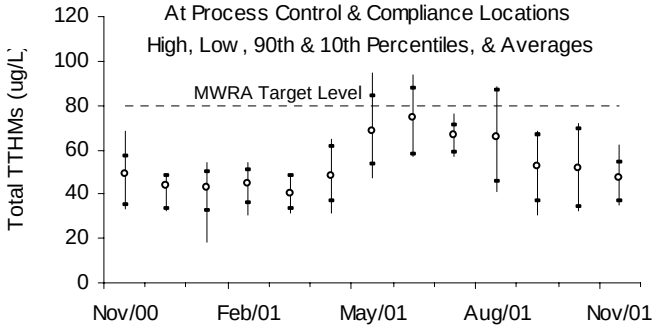
Metropolitan Boston

At Process Control & Compliance Locations
High, Low , 90th & 10th Percentiles, & Averages



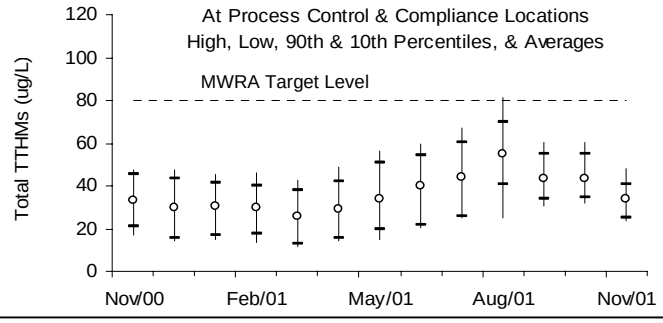
MetroWest Communities

At Process Control & Compliance Locations
High, Low , 90th & 10th Percentiles, & Averages



Chicopee Valley Aqueduct (CVA)

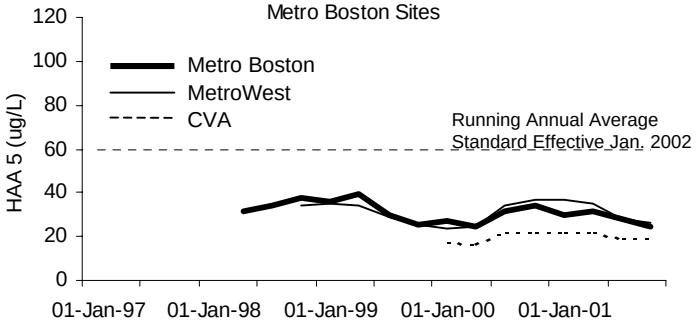
At Process Control & Compliance Locations
High, Low, 90th & 10th Percentiles, & Averages



HALOACETIC ACIDS

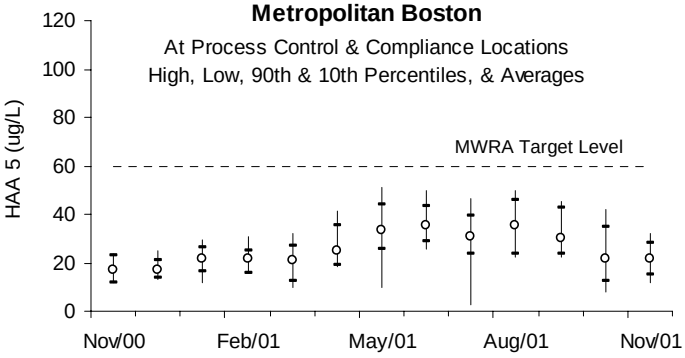
HAA Running Annual Averages

At Compliance Locations For CVA, MetroWest, and Metro Boston Sites



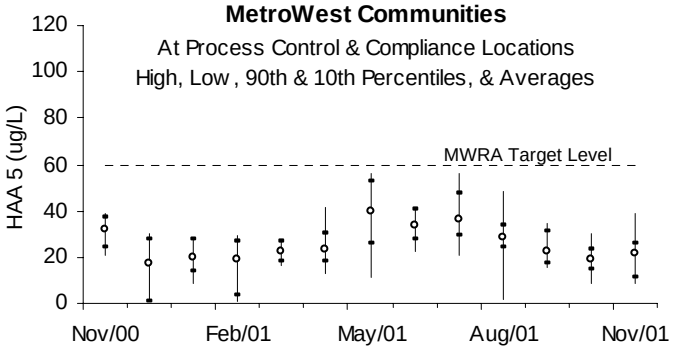
Metropolitan Boston

At Process Control & Compliance Locations
High, Low, 90th & 10th Percentiles, & Averages



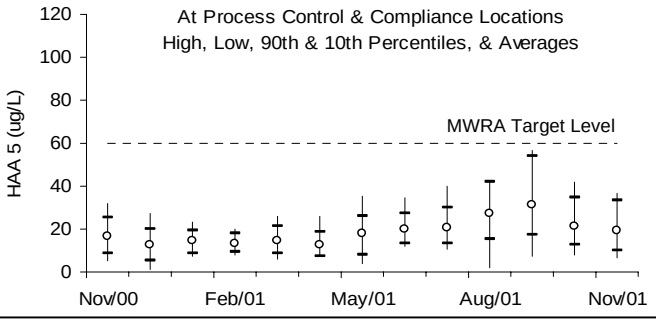
MetroWest Communities

At Process Control & Compliance Locations
High, Low , 90th & 10th Percentiles, & Averages



Chicopee Valley Aqueduct (CVA)

At Process Control & Compliance Locations
High, Low, 90th & 10th Percentiles, & Averages



MWRA Monthly Water Quality Analysis
November 2001

This page provides information on water quality at six locations in the MWRA transmission system. Results reflect a "snapshot" in time and may not represent typical conditions. Elevated levels of a particular parameter may occur from time to time. MWRA staff review these numbers carefully and follow-up unusual results by re-analyzing samples, collecting new samples, or auditing sample sites. More rigorous daily or weekly monitoring of select parameters at these and other locations provides a better overall picture of water quality and is reported for some parameters elsewhere in this document.

	CVA System →		Metropolitan Boston →				Standards →		
Component	Quabbin Reservoir at Ware Disinfection Facility (Raw)	Nash Hill Storage Tanks (Treated)	Wachusett Reservoir at Cosgrove Intake (Raw)	ICC, Marlboro (Treated)	Comm Ave., Newton (Treated)	Shaft 9A, Malden (Treated)	MCL Standard	Units	Exceedance
Alkalinity	2.8	3.6	5.1	29	29	29.1		MG/L	
Aluminum	< 15	< 15	< 15	< 15	< 15	17.2	50-200 (a)	UG/L	NO
Ammonia-N	0.005	< .005	0.00735	< .005	0.410	0.408		MG/L	
Antimony	< .9	< .9	< .9	< .9	< .9	< .9		UG/L	
Arsenic	< .8	< .8	< .8	< .8	< .8	< .8	50 (b)	UG/L	NO
Barium	6.49	6.68	8.7	8.34	8.49	9.25	2000 (b)	UG/L	NO
Beryllium	< .1	< .1	< .1	< .1	< .1	< .1	4 (b)	UG/L	NO
Bromate	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	10	UG/L	NO
Bromide	14.1	3.3	17.4	4.11	4.0	< 2.5		UG/L	
Cadmium	< .2	< .2	< .2	< .2	< .2	< .2	5 (b)	UG/L	NO
Calcium	2080	2300	3870	3840	3860	4020		UG/L	
Chloride	5.7	7.1	17.3	19.4	18.9	16.9	250 (a)	MG/L	NO
Chlorine, Free	-	0.40	-	0.58	0.57	0.14		MG/L	
Chlorine, Total	-	-	-	0.89	2.03	1.99		MG/L	
Chromium	< .6	< .6	< .6	< .6	< .6	< .6	100 (b)	UG/L	NO
Coliform, Fecal, MF Method	0	-	0	-	-	-	20 (c)	CFU/100 mL	NO
Coliform, Total, MF Method (e)	10	0	0	0	0	0	100 (c) 0 (d)	CFU/100 mL	NO
Color	3	3	14	10	12	13	15 (a)	C.U.	NO
Copper **	< .9	17.1	13.0	4.4	3.5	6.7	1300 (b)	UG/L	NO
Cyanide	< .01	< .01	< .01	< .01	< .01	< .01	0.2 (b)	MG/L	NO
Fluoride	< .02	0.03	< .02	0.84	0.94	1.11	4 (b)	MG/L	NO
Hardness	7.2	7.8	12.8	12.7	12.8	13.3		MG/L	
Iron **	15.9	15.4	17	12.3	20.1	48.7	300 (a)	UG/L	NO
Lead	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2	15 (b)	UG/L	NO
Magnesium	497	489	767	761	758	802		UG/L	
Manganese	4.5	4.0	13.2	5.7	10.5	31.7	50 (a)	UG/L	NO
Mercury	< .01	< .01	< .01	< .01	< .01	< .01	2 (b)	UG/L	NO
Nickel	1.10	< 1	< 1	< 1	< 1	< 1		UG/L	
Nitrate-N	0.007	0.008	0.061	0.065	0.052	0.069	10 (b)	MG/L	NO
Nitrite	< .005	< .005	< .005	< .005	< .005	< .005		MG/L	
Orthophosphate	0.003	0.003	0.003	0.010	0.010	0.013		MG/L	
pH	6.6	7.1	6.8	8.9	8.8	9.0		S.U.	
Potassium	512	644	869	858	900	858		UG/L	
Selenium	< .9	< .9	< .9	< .9	< .9	< .9	50 (b)	UG/L	NO
Silica (SiO2)	1230	1280	1860	2340	2180	2440		UG/L	
Silver	< .4	< .4	< .4	< .4	< .4	< .4	100 (a)	UG/L	NO
Sodium	3.9	5.4	10.4	23.0	23.5	22.2		MG/L	
Specific Conductance	42	48		140				UMHO/C	
Standard Plate Count, HPC (48 Hrs @ 35C)	108	10	37	1	7	4	500 (d)	CFU/mL	NO
Sulfate (SO4)	5.5	5.5	6.9	7.0	6.9	6.8		MG/L	
Thallium	< 1	< 1	< 1	< 1	< 1	< 1		UG/L	
Total Dissolved Solids	32	26	< 25	79	74	73		MG/L	
Total Organic Carbon	1.79	1.79	2.30	2.03	2.00	2.41		MG/L	
Total Phosphorus	0.005	0.045	0.006	0.009	0.011	0.009		MG/L	
Turbidity	0.38	0.31	0.47	0.43	0.63	0.45	1 (c)	NTU	NO
UV-254	0.02	0.02	0.040	0.031	0.042	0.04		A	
Zinc **	0.9	3.2	4.5	1.4	3.2	7.5	5000 (a)	UG/L	NO

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

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

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

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

(e) - 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
NS = No sample
C.U. = Color Unit
NTU = Nephelometric Turbidity Unit
MG/L = milligrams per liter = parts per million
< = less than method detection limit
** = Metal results may be elevated due to local plumbing at the sample tap.
HPC = Heterotrophic Plate Count
umhos = ohms/1000
Inv Res = Invalid sample result

Most results are based on single grab samples collected on November 5 & 6, 2001 and analyzed by MWRA and contract laboratories.

Special Update on Lead and Copper Sampling for 2001

Results from the September 2001 lead and copper sampling round show that only 88 percent of the targeted high-risk homes had lead levels at or below the Lead Action Level of 15 ppb compared to the requirement of at least 90 percent. The results from September 2001 were especially disappointing, as the March 2001 results had indicated that 92 percent of homes were at or below the Action Level. These results mean that the MWRA system did not reach full compliance with the Lead and Copper Rule this year, and MWRA and communities will need to continue mandatory lead education efforts.

Background

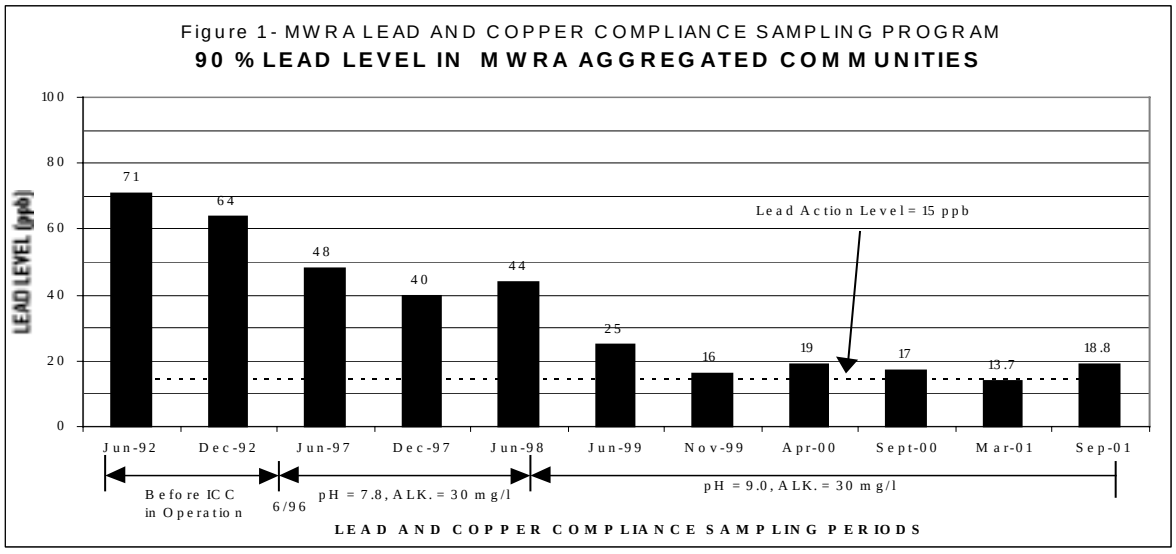
MWRA source waters contain virtually no lead, but lead can leach from lead service pipes connecting homes to water mains and from lead solder and brass fixtures in homes. In 1991, EPA issued the Lead & Copper Rule which set action levels of 15 ppb for lead and 1,300 ppb for copper, and required that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

In 1993, the MWRA Board of Directors approved a fast-track program to improve treatment to reduce lead levels at consumers' taps through construction of the Interim Corrosion Control (ICC) facility in Marlborough. This interim facility will be used until the new Walnut Hill Water Treatment Plant is completed in 2004.

A three phase ramp-up of the facility was completed in July 1998, and the first full-scale compliance sampling round was carried out in June 1999. Subsequent rounds were taken in November 1999, and April and September 2000. Over 500 samples were collected for each sampling round, of which over 400 samples were residential samples and about 100 samples were school samples. Samples are collected by each of the 29 fully served communities in the metro Boston area.

Results

The 90th percentile lead level for the September 2001 round of sampling was 18.8 ppb and 125 ppb for copper. Both lead and copper 90th percentile levels have been reduced significantly over the last 3 years. As a system, MWRA is getting closer to consistently passing the Lead Action Level of 15 ppb. The chart below illustrates the history of full scale testing of lead in the MWRA system since 1992. MWRA has always been in compliance with the Copper Action Level of 1,300 ppb.



Treatment acclimation of a large distribution system to lead corrosion control is a slow process. The first compliance sampling round in June 1999 indicated that the MWRA system initially responded quite quickly, showing reduction in lead levels from 44 ppb to 25 ppb within 12 months of treatment optimization. However, the next three sampling rounds' results in November 1999, April and September 2000, with lead levels of 16 ppb, 19 ppb and 17 ppb respectively, indicated that further reductions would come more slowly. Results from March 2001 round were promising as MWRA was in compliance with the Lead Action Level for the first time, but MWRA staff was cautious about the results because the water temperature for this sampling round was particularly low which may have resulted in lower than usual lead levels. MWRA believes that compliance with the lead standard is achievable, but further evaluation may be necessary after future sampling rounds are investigated. Furthermore, capital improvement program construction over the next few years could affect treatment consistency and water quality stability and may create temporary increases in lead levels.

Other Water Quality Benefits

In addition to the lead and copper reduction, the corrosion control treatment has provided additional benefits in helping maintain chlorine residual and controlling nitrification. Since the implementation of high pH for corrosion control and modification of chloramine disinfection, chlorine booster stations for remote communities have been shut down, average chloramine residuals have risen substantially, and less than 2% of the over 400 chlorine sample locations have residuals less than 0.10 mg/l. Complaints about red/yellow water from iron corrosion of unlined cast iron pipes have also gone down significantly.

Benefits have extended to the wastewater system as well. Copper levels in the biosolid pellets produced at the Fore River pelletizing plant have dropped substantially over the last 2½ years. The weekly lead concentrations have lower peaks and have not exceeded the EPA standard for unrestricted use of 300 mg/kg since September 1999. The copper concentrations have reduced significantly below the EPA standard for unrestricted use of 1000 mg/kg since August 1998. Presently, both lead and copper concentrations in the biosolid pellets are under the EPA limit of lead and copper for unrestricted use.

Lead and Copper Rule Public Education

MWRA has helped to develop and support education efforts targeted to the most vulnerable populations (children under 6 and pregnant women). A brochure is available. It covers:

- The many exposures of lead, including the leading causes of lead poisoning: lead paint and lead paint dust.
- The sources of lead in consumer tap water - home service piping, lead solder and some brass fixtures.
- A description of health effects of lead.
- A summary of what MWRA and local water departments are doing to reduce lead levels at the tap.
- A list of eight simple steps to reduce exposure to lead in tap water.
- Other sources of information including many useful web links and phone numbers.

The response to this improved lead education brochure has been positive, and we expect many of our service communities to continue to use it. Other lead education and outreach efforts include an improved web page on lead in tap water based on the lead brochure with links to the lead results for each town in the *Report on Your Drinking Water*. Also included on this improved web page are links to a list of DEP approved labs to test tap water, the DPH Childhood Lead Prevention Program, the NSF, and local water departments. Check out these resources through the available links at our web page, www.mwra.com, and feel free to direct consumer questions on lead to this site. For copies of the lead education brochure, contact your local water department, or contact MWRA at (617) 242-5323 or visit us on-line.