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WATER QUALITY UPDATE
An Analysis of March 2011 Sampling Data
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MASSACHUSETTS WATER RESOURCES AUTHORITY
100 First Avenue, Charlestown Navy Yard, Boston, MA 02129



MWRA WATER QUALITY UPDATE

March 2011 Highlights

- Special Report on hexavalent chromium.** MWRA has begun a research sampling program for hexavalent chromium, an unregulated form of total chromium. Results from the first quarter's results were just above the very sensitive detection level of 0.02 parts per billion.
- MWRA achieved CT disinfection requirements for the month** at the Ware Disinfection Facility and the Carroll Water Treatment Plant. CT results appear on Page 3. No community violated the Total Coliform Rule criteria. See Page 4.
- MWRA reduced the length of the printed copy of the Monthly Water Quality Update to reduce printing and postage costs.** A longer more detailed version will continue to be posted on the MWRA web site. You can help us save paper and money by requesting an electronic copy of the Update – call (617) 242-5323 or email Joshua.Das@mwra.state.ma.us

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Release Date: April 20, 2011

Source Water – Microbial and Turbidity Results

March 2011

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. However, 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 water supplies allows for no more than 10% of source water samples prior to disinfection over any six-month period to 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.

None of the 31 samples were positive during March.

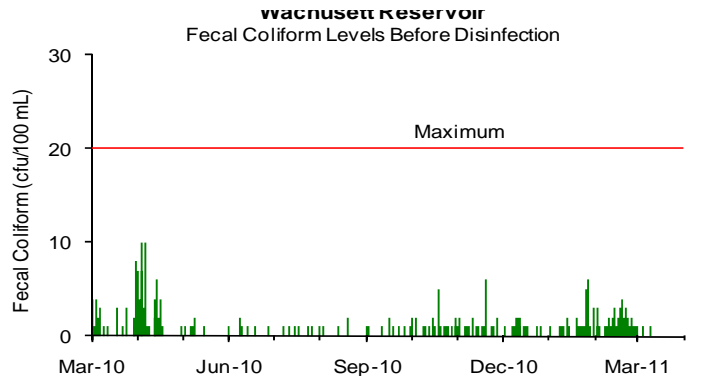
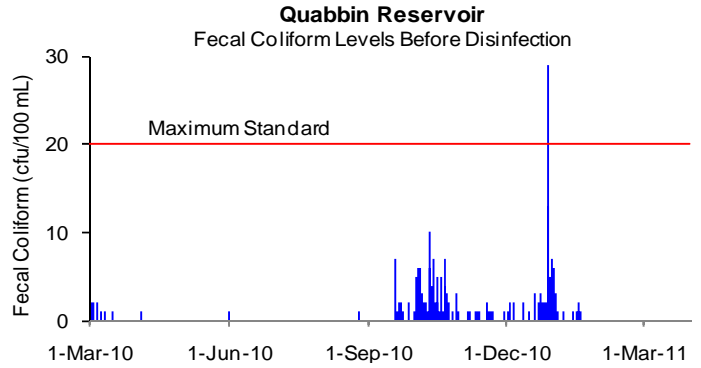
For the current six-month period, 0.5% of the samples have exceeded a count of 20 cfu/100ml due to a single positive sample in December 2010.

Sample Site: Wachusett Reservoir

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

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.

Seven of the 31 samples were positive during March. None of the samples exceeded a count of 20 cfu/100ml. For the current six-month period, 0% of the samples have exceeded a count of 20 cfu/100mL.

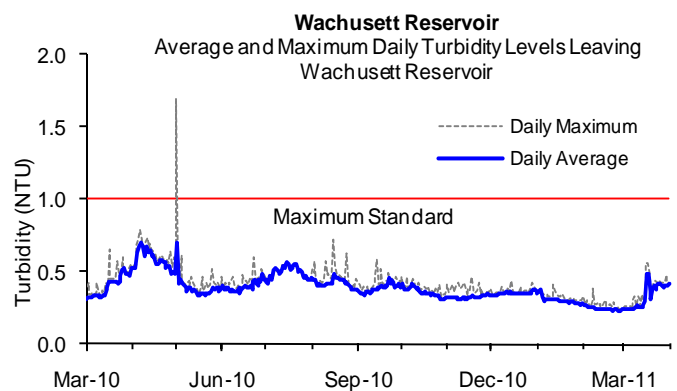
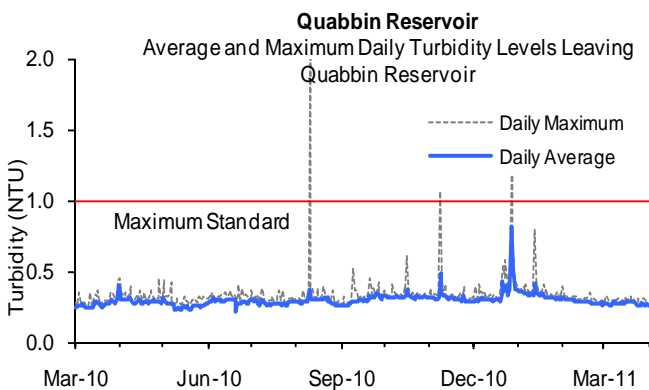


Source Water – Turbidity Results

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.

There are two standards for turbidity: all water must be below 5 NTU (Nephelometric Turbidity Units), and water only can be above 1 NTU if it does not interfere with effective disinfection.

Turbidity of Quabbin Reservoir water is monitored continuously using on-line analyzers at the Ware Disinfection Facility (WDF) before chlorination. Turbidity of Wachusett Reservoir is monitored continuously at the Carroll Water Treatment Plant (CWTP) before ozonation. Maximum turbidity results at Quabbin and Wachusett were within standards for the month.



Treated Water – Disinfection, pH and Alkalinity Results

March 2011

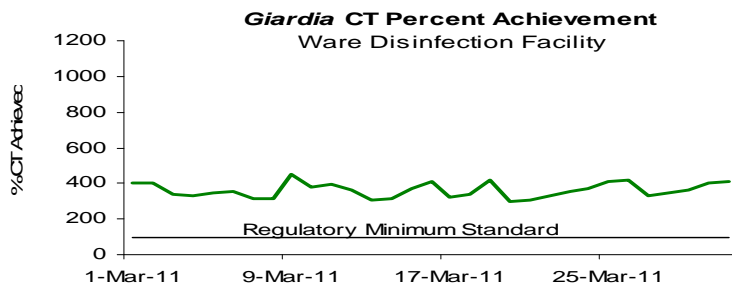
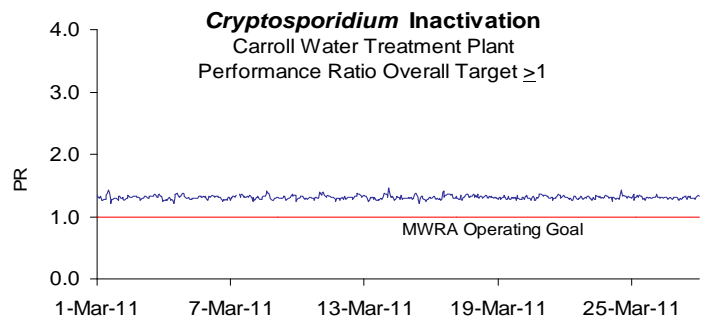
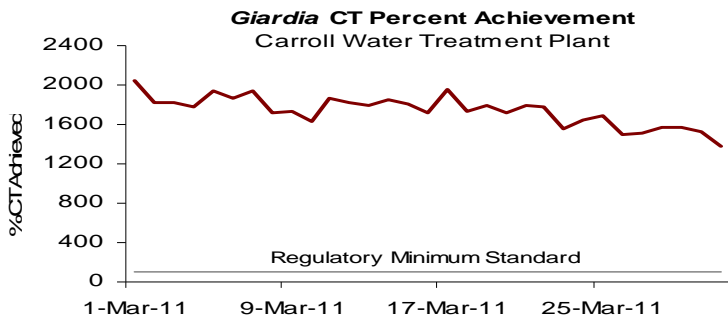
Treated Water - Primary Disinfection

With the activation of the Carroll Water Treatment Plant (CWTP), MWRA now reports on both regulatory required 99.9% inactivation for *Giardia* (reported as "CT"), and its voluntary operating goal of 99% inactivation for *Cryptosporidium* (reported as "PR"). MWRA calculates hourly CT inactivation rates and reports daily CT inactivation rates at maximum flow, as specified by EPA regulations. 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.

Compliance with the *Giardia* standard is expressed as percent of required CT achieved; 100% is the minimum allowed. To avoid confusion with the regulatory requirements, inactivation of *Cryptosporidium* is reported as Performance Ratio (PR). A PR of 1 demonstrates inactivation of 99% of *Cryptosporidium* based on site-specific data.

Wachusett Reservoir – MetroWest/MetroBoston Supply:

- *Giardia* CT was maintained above 100% at all times the plant was providing water into the distribution system for March; MWRA's operating goal to meet a *Cryptosporidium* PR of 1 was met for every hour of the month.
- Ozone dose at the CWTP varied between 2.2 to 2.8 mg/L for March.
- During months when the water is cold, a higher level of disinfection is required to achieve MWRA's PR target for *Cryptosporidium*; this results in a much higher CT achievement for *Giardia*.



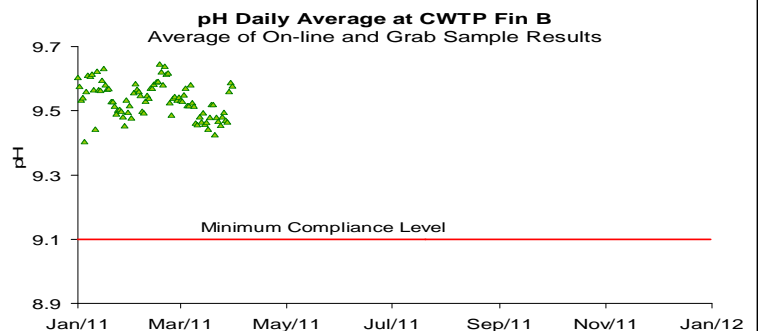
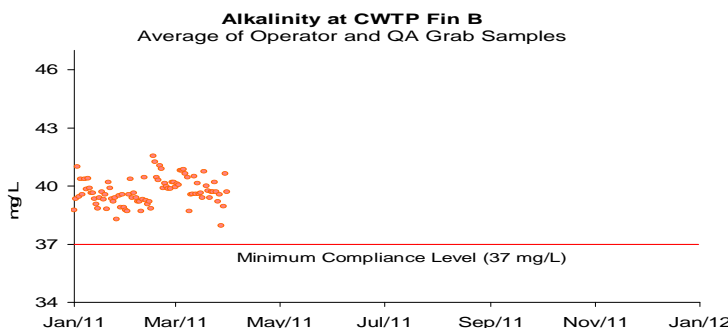
Quabbin Reservoir at Ware Disinfection Facility (CVA Supply):

Giardia CT was maintained above 100% at all times the plant was providing water into the distribution system for March. The chlorine dose remains at 1.3 mg/L.

pH and Alkalinity Compliance:

MWRA adjusts the alkalinity and pH of Wachusett water to reduce its corrosivity which minimizes 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; the target for alkalinity is 40 mg/L. Per DEP requirements, samples from the CWTP Fin B tap have a minimum compliance level of 9.1 for pH and 37 mg/L for alkalinity. Samples from 27 distribution system taps have a minimum compliance level of 9.0 for pH and 37 mg/L for alkalinity. Results must not be below this level for more than 9 days in a six-month period. MWRA tests finished water pH and alkalinity daily at the CWTP Fin B sampling tap. Distribution system samples are collected in March, June, September, and December. Distribution system samples were collected on March 21 and 22, 2010. Distribution system sample pH ranged from 9.2 to 9.7 and alkalinity ranged from 40 to 42 mg/L.

In March and over the past six-months, no sample results were below the target levels.



Bacteria & Chlorine Residual Results for Communities in MWRA Testing Program March 2011

While all communities collect bacteria samples for the Total Coliform Rule (TCR), 41 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 10 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 139 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 TCR 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 likely indicates potential 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. A disinfectant residual is intended to maintain the sanitary integrity of the water; MWRA considers a residual of 0.2 mg/L a minimum target level at all points in the distribution system.

Highlight

Two of the 2,024 community samples (0.1%) system-wide tested positive for confirmed total coliform during the month of March. None of the 761 MWRA samples (0.0%) tested positive for confirmed total coliform. No sample tested positive for *E.coli*. All 41 systems that submitted chlorine residual data maintained an average disinfectant residual of at least 0.2 mg/L. Only 1.6% of the samples had results lower than 0.2 mg/L.

TCR results by Community								
Town	Samples Tested for Coliform (a)	Total Coliform # (%) Positive	<i>E.coli</i> % Positive	Public Notification Required?	March 2011 Minimum Chlorine Residual (mg/L)	March 2010 Minimum Chlorine Residual (mg/L)	March 2011 Average Chlorine Residual (mg/L)	March 2010 Average Chlorine Residual (mg/L)
ARLINGTON	70	0 (0%)	0.0%		0.11	0.44	1.88	1.80
BELMONT	32	0 (0%)	0.0%		1.30	1.22	1.84	1.78
BOSTON	273	2 (0.73%)	0.0%	No	1.61	1.61	2.12	1.98
BROOKLINE	85	0 (0%)	0.0%		0.08	0.04	1.92	1.91
CHELSEA	52	0 (0%)	0.0%		1.47	0.55	1.83	1.86
DEER ISLAND	16	0 (0%)	0.0%		1.92	1.75	2.06	2.00
EVERETT	40	0 (0%)	0.0%		0.01	1.01	1.04	1.12
FRAMINGHAM	72	0 (0%)	0.0%		0.56	0.33	1.95	1.88
HANSCOM AFB (Bedford) (b)	9	0 (0%)	0.0%		0.21	0.05	1.59	0.25
LEXINGTON	45	0 (0%)	0.0%		1.19	0.76	2.02	1.89
LYNNFIELD	6	0 (0%)	0.0%		0.60	0.95	1.36	1.77
MALDEN	60	0 (0%)	0.0%		1.29	1.27	1.38	1.30
MARBLEHEAD	24	0 (0%)	0.0%		0.37	0.51	1.75	1.73
MARLBOROUGH (b)	42	0 (0%)	0.0%		1.35	1.23	1.97	1.52
MEDFORD	85	0 (0%)	0.0%		1.12	0.91	1.86	1.90
MELROSE	36	0 (0%)	0.0%		0.04	0.02	1.21	0.87
MILTON	32	0 (0%)	0.0%		1.36	1.27	1.86	1.63
NAHANT	10	0 (0%)	0.0%		0.09	0.09	1.41	1.43
NEEDHAM (b)	41	0 (0%)	0.0%		0.08	0.17	0.70	0.44
NEWTON	92	0 (0%)	0.0%		0.68	0.22	1.86	1.75
NORTHBOROUGH (b)	16	0 (0%)	0.0%		0.24	0.14	1.06	1.39
NORWOOD	36	0 (0%)	0.0%		0.56	0.21	1.71	1.65
QUINCY	115	0 (0%)	0.0%		0.43	0.42	1.77	1.74
READING	50	0 (0%)	0.0%		1.03	0.80	1.79	1.71
REVERE	76	0 (0%)	0.0%		1.41	1.24	1.86	1.87
SAUGUS	40	0 (0%)	0.0%		1.61	1.72	1.91	1.94
SOMERVILLE	104	0 (0%)	0.0%		1.64	1.20	2.29	2.07
SOUTH HADLEY FD1 (c)	16	0 (0%)	0.0%		0.05	0.04	0.43	0.42
SOUTHBOROUGH	10	0 (0%)	0.0%		1.03	0.03	1.98	1.52
STONEHAM	35	0 (0%)	0.0%		1.64	1.51	1.99	1.89
SWAMPSCOTT	16	0 (0%)	0.0%		1.20	0.64	1.75	1.37
WAKEFIELD (b)	55	0 (0%)	0.0%		0.63	0.37	1.51	1.39
WALTHAM	72	0 (0%)	0.0%		1.26	1.14	1.97	1.96
WATERTOWN	50	0 (0%)	0.0%		1.01	0.89	1.98	1.79
WELLESLEY (b)	36	0 (0%)	0.0%		0.08	0.08	0.60	0.55
WESTBORO HOSPITAL	5	0 (0%)	0.0%		0.55	0.53	1.18	1.72
WESTON	17	0 (0%)	0.0%		1.30	0.82	1.92	1.70
WILMINGTON (b)	29	0 (0%)	0.0%		1.58	-	1.96	-
WINCHESTER (b)	25	0 (0%)	0.0%		0.23	0.11	0.87	0.74
WINTHROP	24	0 (0%)	0.0%		0.41	0.3	1.17	1.47
WOBURN (b)	75	0 (0%)	0.0%		0.16	0.07	1.02	1.23
Total:	2024	2 (0.10%)	0.0%					
MASS. WATER RESOURCES AUTHORITY (d,e)	761	0 (0%)	0.0%		0.01	0.02	1.90	1.78

(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.

(e) MWRA total coliform and chlorine residual results include data from 125 community pipe locations as described above. In most cases these community results are accurately indicative of MWRA water as it enters the community system; however, some are clearly strongly influenced by local pipe conditions. Residuals in the MWRA system are typically between 1.0 and 2.8 mg/L.

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

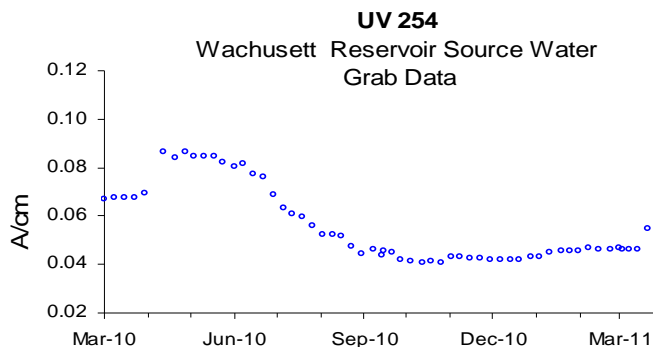
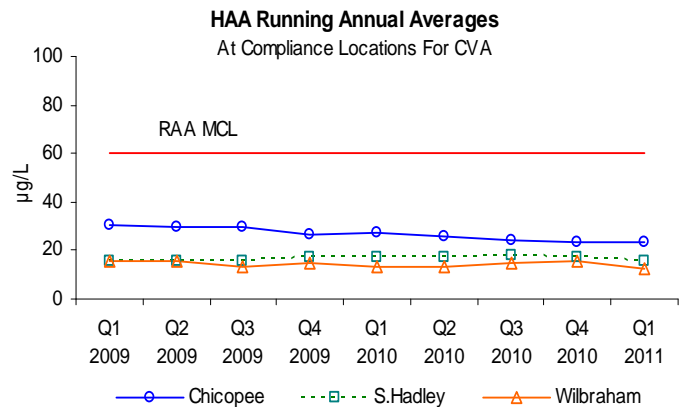
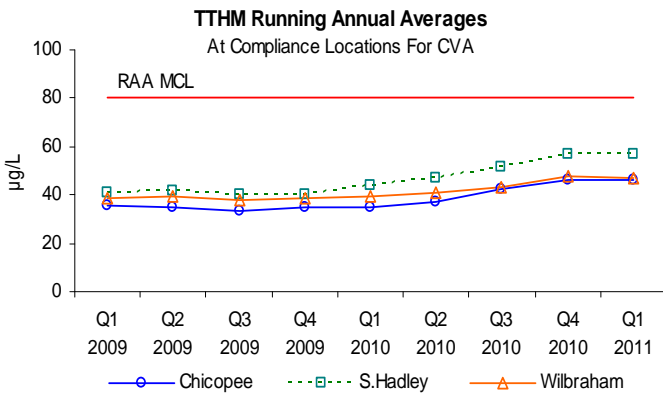
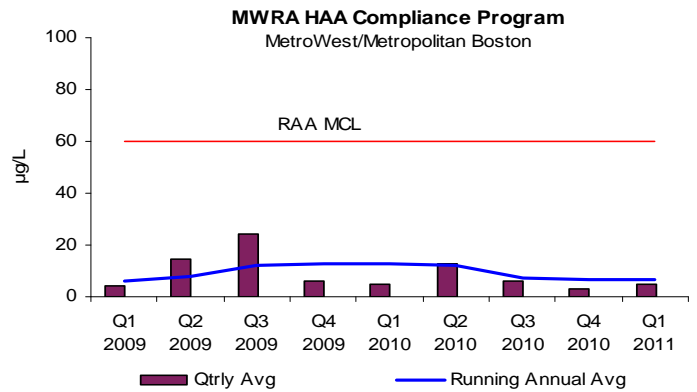
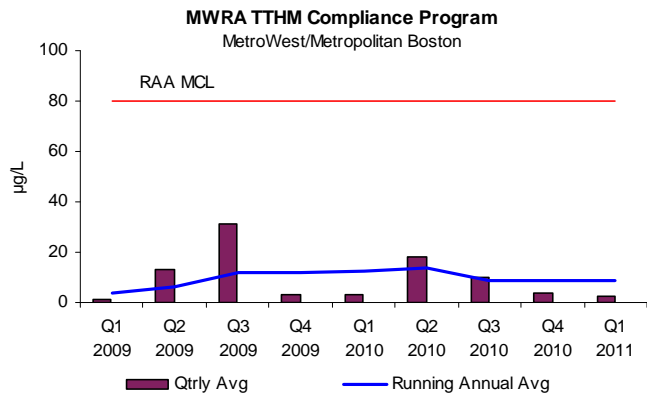
March 2011

Total Trihalomethanes (TTHMs) and Haloacetic Acids (HAA5s) are by-products of disinfection treatment with chlorine. TTHMs and HAA5s are of concern due to their potential adverse health effects at high levels. EPA's running annual average (RAA) standard is 80 µg/L for TTHMs and 60 µg/L for HAA5s. The switch from chlorine to ozone for primary disinfection and the consolidation of treatment has lowered DBP formation and results are now more uniform. DEP requires that compliance samples be collected quarterly. 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 DBPs have dropped to very low levels with the 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 µg/L.

The RAA for TTHMs and HAA5s for MWRA's Compliance Program (represented as the line in the top two graphs below) remain below current standards. The RAA for TTHMs = 8.7 µg/L; HAA5s = 6.8 µg/L. CVA's DBP levels continue to be below current standards. UV-254 levels are currently around 0.05 A/cm. The current RAA for Bromate = 0.0 µg/L.



MWRA Monthly Water Quality Analysis

March 2011

This page provides information on water quality at four 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) and finished water leaving the treatment plant (CWTP Finished water tap). The "CVA System" locations represent raw water from the Quabbin Reservoir (WDF) and finished water after all treatment (LMS). See www.mwra.com for additional information on other parameters which are monitored less frequently.

CVA System | Wachusett System Metro-Boston | Standards →

Component	Quabbin Res. at Ware Disinfection Facility (Raw)	Ludlow Monitoring Station (Treated)	Carroll Water Treatment Plant Inlet (Raw)	Carroll Water TP Fin. Water Tap B (Treated)	Health Standard	Aesthetics or Other Standards	Units	Method Reporting Limit
Alkalinity	2.6	3.6	5.5	39.7			MG/L	0.05
Aluminum	U	U	U	U		50-200 (c)	UG/L	15.0
Ammonia-N, Total	U	U	0.01	0.40			MG/L	0.005
Antimony	U	U	U	U	6 (b)		UG/L	0.4
Arsenic	U	U	U	U	10 (b)		UG/L	1.0
Barium	6.5	6.5	8.1	8.2	2000 (b)		UG/L	2.0
Beryllium	U	U	U	U	4 (b)		UG/L	0.3
Bromate	U	U	U	U	10 (b)		UG/L	5.0
Bromide	10.6	8.7	15.9	15.6			UG/L	5.0
Cadmium ⁽¹⁾	U	U	U	U	5 (b)		UG/L	0.5
Calcium	2100	2150	4170	4160			UG/L	20
Chloride	7.5	8.7	19.6	22.5		250 (c)	MG/L	0.5
Chlorine, Free		0.65			4 (b)(d)		MG/L	0.02
Chlorine, Total				2.5	4 (b)(d)		MG/L	0.02
Chromium, Total	U	U	U	U	100 (b)		UG/L	1.0
Coliform, Fecal, MF Method	U		U		20 (a)		CFU/100 mL	1
Coliform, Total, MF Method ^(e)	U	U	2	U	100 (a) 0 (b)		CFU/100 mL	1
Copper **	U	U	U	U		1300 (f) 1000 (g)	UG/L	3.0
Cyanide	U	U	U	U	0.2 (b)		MG/L	0.01
Fluoride ⁽³⁾	U	U	0.02	1.02	4 (b)		MG/L	0.02
Hardness ⁽²⁾	7.4	7.5	13.6	13.5			MG/L	0.194
Iron **	13.5	14.5	13.9	14.1		300 (c)	UG/L	6.0
Lead	0.11	0.06	U	U		15 (f)	UG/L	0.05
Magnesium	531	525	826	821			UG/L	35
Manganese	5.12	4.32	5.98	5.83		50 (c)	UG/L	0.1
Mercury ⁽¹⁾	U	U	U	U	2 (b)		UG/L	0.05
Nickel	1.1	U	0.7	U			UG/L	0.5
Nitrate-N	0.009	0.009	0.066	0.073	10 (b)		MG/L	0.005
Nitrite	U	U	U	U	1 (b)		MG/L	0.005
Orthophosphate	0.004	U	0.004	0.007			MG/L	0.0025
pH	6.6	6.9	7.0	9.6			S.U.	
Potassium	544	542	984	964			UG/L	200
Selenium	U	U	U	U	50 (b)		UG/L	1.0
Silica (SiO2)	1870	1870	2480	2880			UG/L	200.0
Silver	U	U	U	U		100 (c)	UG/L	1.0
Sodium	5.2	6.2	12.2	30.9			MG/L	0.2
Specific Conductance	49	54	105	185			UMHO/cm	0.3
Standard Plate Count, HPC	3		12	U	500 (b)		CFU/mL	1
Sulfate (SO4)	4.6	4.5	6.2	8.1		250 (c)	MG/L	1.0
Thallium	U	U	U	U	2 (b)		UG/L	0.3
Total Dissolved Solids	33.0	35.0	60.0	104.0		500 (c)	MG/L	13
Total Organic Carbon	1.8	1.7	2.2	2.1			MG/L	0.3
Total Phosphorus	U	U	U	U			MG/L	0.05
UV-254	0.020	0.016	0.046	0.030			A/cm	0.000965
Zinc **	5.1	1.8	U	1.6		5000 (c)	UG/L	1.5

- (a) = Primary MCL standard (health related), applies to source (raw) water only. DEP "Drinking Water Regulations", 310CMR 22.00.
- (b) = Primary MCL standard (health related). DEP "Drinking Water Regulations", 310CMR 22.00. Applies to samples of treated water downstream of Wachusett and Quabbin Reservoirs. Most based on annual average.
- (c) = Secondary MCL standard (aesthetic related). DEP "Drinking Water Regulations", 310CMR 22.00.
- (d) = Maximum Residual Disinfectant Level. DEP "Drinking Water Regulations", 310CMR 22.00. Based on annual average.
- (e) = Confirmed results only are reported.
- (f) = Refers to 90th percentile Action Level.
- (g) = Refers to a single sample, secondary MCL.

U = Less than method reporting limit
MCL = Maximum Contaminant Level
█ = Not Applicable
CFU = Colony Forming Unit
S.U. = Standard Units

UG/L = micrograms per liter = parts per billion
MG/L = milligrams per liter = parts per million
NTU = Nephelometric Turbidity Unit
HPC = Heterotrophic Plate Count (48 Hrs @ 35 °C)
** = Metal results may be elevated due to local plumbing at the sample tap.

Bold Italics = Samples from March
Regular Font = Samples from January

Most results are based on single grab samples collected on March 1, 3, 7 and 9, 2011 and analyzed by MWRA and contract laboratories.

- NOTES:**
- (1) Due to MWRA lab equipment having higher sensitivity, MWRA's tests for several parameters are more sensitive than the EPA-set levels of detection and reporting. For example, the EPA minimum detection limit for cadmium is 1 ug/L and 0.2 ug/L for mercury, and MWRA lab tests and reports at lower than these detection limits.
 - (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.
 - (3) Fluoride dose is 1.0 mg/L with a desired range of 0.8 to 1.2 mg/L.

Special Update on Hexavalent Chromium

MWRA has begun a testing program for hexavalent chromium and the first set of quarterly samples have been analyzed. Hexavalent chromium was detected at very low levels, just barely above the detection limit of 0.02 parts per billion (or 20 parts per trillion).

In December 2010, the Environmental Working Group, a national advocacy group, issued a report on hexavalent chromium (chromium-6) based on limited testing that the group had conducted in 35 cities around the United States. MWRA water was among those tested (identified as Boston in the report) and had among the lowest levels detected nationwide. Hexavalent chromium is not regulated by EPA and testing is not currently required.

Hexavalent chromium is noteworthy as the contaminant made famous in the movie *Erin Brockovich* starring Julia Roberts. Extensive national coverage of the Environmental Working Group's release of its report on hexavalent chromium prominently headlined the "carcinogenic Erin Brockovich chemical." MWRA and water systems across the nation received many calls from consumers interested in learning more about the potential contaminant.

Hexavalent chromium is not regulated in drinking water by EPA or any state at this time. EPA does regulate total chromium at 100 parts per billion (ppb) or micrograms per liter (ug/L). MWRA's total chromium levels have typically been below 1 ppb. Chromium is a relatively abundant element, and trivalent chromium (chromium-3), the more common form, is an essential nutrient with recommended daily allowances of 20-45 ug/day. Hexavalent chromium is another form of chromium and would normally be detected (but not specifically identified) as part of the total chromium measurement. While most of the publicized cases of occurrence of high levels of hexavalent chromium in water have been from industrial contamination, the most common form of chromium - trivalent chromium - can switch back and forth to hexavalent chromium in the presence of oxidants such as chlorine or ozone.

The Environmental Working Group's report was based on a very limited sampling of waters across the US. The Boston sample was reported to have had a level of 0.03 ppb, which was the lowest level detected. Subsequent to the release of the report, EPA issued guidance on sampling and analysis, using extremely sensitive lab methods. MWRA reviewed EPA's recommendations and decided that a program of testing was appropriate for MWRA's system at this time.

MWRA's testing program will consist of one year of quarterly samples of raw water, finished water at the Carroll Water Treatment Plant, and at four locations within the distribution system. For at least the first quarter, duplicate samples and extra lab and field blanks will be collected and analyzed for improved confidence in the results.

Sample Results

The first quarterly results are very low – just above the method detection limit detection level of 0.02 ppb (or 20 nanograms per liter or parts per trillion). This is consistent with the single result from the EWG report which had a detect of 0.03 ppb. The results are tightly clustered just above the method detection limit, ranging from non-detect (ND, less than 0.02 ppb) to 0.027 ppb. All of the results were below the lab's minimum reporting level of 0.05 ppb. This indicates that the chemical is present, but the actual quantities can only be estimated.

Based on the closeness to the detection level and the tightness of the spread, firm conclusions about sources, transformation of chromium-3 to chromium-6, or degradation of chromium-6 cannot be drawn. But, the data do show the raw water as not detected and most of the finished water samples as detected, lending some support to the theory that ozone and chlorine convert chromium-3 to chromium-6.

While MWRA water typically has non-detectable amounts of total chromium with standard laboratory reporting limits of 1 ppb, additional scrutiny of raw instrument data allowed estimates of total chromium below 1 ppb to be made. Measurements show the raw water as having some total chromium possibly indicating that the sources may be natural, but other sources such as trace amounts in treatment chemicals cannot be ruled out. After a few more quarters of data, a better picture of possible sources may arise.

Special Update on Hexavalent Chromium

Sample Results continued

Without a regulatory standard, the results are not easy to interpret. The EWG report compared each city's result to the then current draft proposed California Public Health Goal for hexavalent chromium of 0.06 ppb. This goal was later lowered to 0.02 ppb, but is still not finalized. A Public Health Goal is similar to EPA's Maximum Contaminant Level Goal (MCLG); it is a non-enforceable goal designed to be at a level below which there is no health risk, with a margin of safety. Enforceable drinking water standards (called Maximum Contaminant Levels) are set above the MCLGs based on a number of factors set out in the federal Safe Drinking Water Act. California does not have an enforceable drinking water standard at this time. The Public Health Goal is very conservative, and it is expected that drinking water standards to be developed by California and EPA will be much higher.

Discussions with EPA and other water systems indicate that a number of water systems will be conducting sampling over the next year, and MWRA will review its results in light of those of other systems, as well as any available regulatory or health data available at the time.

1st Quarter Results of Chromium-6 and Total Chromium Sampling

Sample	Hexavalent Chromium Estimated Results (No drinking water standard)		Total Chromium Estimated Results (EPA MCL = 100 ppb)	
	1 st Sample	Duplicate	1st Sample	Duplicate
Raw water	ND	ND	0.15	0.16
Finished at Plant	ND	0.021	0.18	0.20
Distribution Sample - 1	ND	ND	0.19	0.21
Distribution Sample - 2	0.027	0.026	0.22	0.38
Distribution Sample - 3	0.024	0.020	0.23	0.23
Distribution Sample - 4	0.021	0.023	0.22	0.18

All results are in ug/L or ppb. ND=Not Detected at 0.02 ug/L.