2006 Water Quality Report

Worcester Department of Public Works & Parks
Water Operations Division
Public Water System Identification Number 2348000
www.ci.worcester.ma.us

We are pleased to present to you this year's Annual Water Quality Report for the City of Worcester. The intent of this report is to inform you about your drinking water. The United States Environmental Protection Agency (USEPA) and the Massachusetts Department of Environmental Protection (MassDEP) require the City to provide this information on an annual basis. This report is for the calendar year 2006.

The accompanying tables and descriptions show that our system met all water quality standards. This Department takes pride in making sure that your drinking water complies with all federal and state requirements.

In order to ensure that tap water is safe to drink, USEPA and MassDEP prescribe regulations that limit the amount of certain contaminants in water provided by public water systems. The Food and Drug Administration (FDA) and Massachusetts Department of Public Health regulations establish limits for contaminants in bottled water that must provide the same protection of public health.

By complying with the strict regulations for public water systems, Worcester DPW&P Water Operations can be sure that your drinking water is safe. This Water Quality Report is intended to provide you with all of the information available on Worcester's drinking water quality. The report contains general information on Worcester's water system including a list of drinking water sources (where the water comes from), an overview of treatment used in 2006 and results of water tests conducted during the year.

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

Sources of Supply

Worcester obtains its drinking water from ten surface water sources, or reservoirs, located outside of the City. The watershed for these reservoirs covers 40 square miles in Leicester, Paxton, Rutland, Holden, Princeton, Hubbardston and Worcester. Below are the individual reservoirs, their storage capacities and locations.

Lynde Brook Reservoir	**717.4 Million Gallons**	**Leicester**
Kettle Brook Reservoir No.1	**19.3 Million Gallons**	**Leicester**
Kettle Brook Reservoir No.2	**127.3 Million Gallons**	**Leicester**
Kettle Brook Reservoir No.3	**152.3 Million Gallons**	**Leicester, Paxton**
Kettle Brook Reservoir No.4	**513.7 Million Gallons**	**Paxton**
Holden Reservoir No. 2	**257.4 Million Gallons**	**Holden**
Holden Reservoir No. 1	**729.3 Million Gallons**	**Holden**
Kendall Reservoir	**792.2 Million Gallons**	**Holden**
Pine Hill Reservoir	**2,971.0 Million Gallons**	**Paxton, Holden, Rutland**
Quinapoxet Reservoir	**1,100.0 Million Gallons**	**Holden, Princeton**
Total	**7,379.9 Million Gallons**	

In addition to these 10 active reservoirs the City has two wells, the Coal Mine Brook Well on Lake Ave North in Worcester and the Shrewsbury Well off Holden Street in Shrewsbury. Both wells are inactive but could be used in an emergency. Emergency water supplies are also available at Wachusett Reservoir and the Quabbin Aqueduct. A small area around Mountain Street West is supplied with water purchased from the Town of Holden water system. This area includes Mountain St. West from #157 to the Holden line (including Stratton Hill Park Apartments), Maravista Rd., Maranook Rd., Wendover Rd., and the first 500 feet of Lanesboro Rd. Relocated.

The **first barrier** of protection for any water supply system is to have clean sources of water. To protect a surface water supply one must control the land within the watershed surrounding the supply. Worcester has maintained very strict control over the land it holds for water supply protection. However, not all of the land in Worcester's watershed is owned or controlled by the City. On some of those privately owned lands activities occur that could pose a threat to water quality in the reservoirs. The potentially threatening land uses include: dairy farms, livestock operations, manure spreading or storage, pesticide storage and use, railroad tracks, aquatic wildlife, landfills and dumps, power line rights of way, stormwater discharges, highways and roadways. Overall, Worcester's water supplies are considered highly susceptible to contamination. More information on watershed protection issues is available in the Source Water Assessment & Protection (SWAP) report prepared by DEP in 2002 and available from Worcester DPW&P Water Operations by calling 508-799-1484 or at www.mass.gov/dep/water/drinking/2348000.pdf.

Water Treatment

Protecting the sources of water is not enough to assure that your tap water is safe to drink. Both natural and manmade contaminants can still enter even the most well protected water supply. Water treatment is necessary as the **second barrier** of protection.

During 2006, water from Worcester's reservoirs was treated at the Worcester Water Filtration Plant, which began operating in 1997 and has continuously produced water that fully complies with Federal and State drinking water standards. In calendar 2006, the Water Filtration Plant treated 7,986,410,000 gallons of water using the following processes:

- **Ozonation using ozone generated on-site** to disinfect and break down organic matter making the water more efficiently filtered. This is the most effective disinfectant for the parasites giardia and cryptosporidium.
- **Coagulation & Flocculation using cationic polymer and alum** to make tiny particles in the water stick together to form larger particles, which can then be trapped in the filters.
- **Direct Filtration** to remove particles from the water using a coal and sand filter.
- **pH Adjustment with lime (Calcium Oxide)** to make the water less acidic and less corrosive.
- **Disinfection with chlorine** to kill bacteria and other microorganisms.
- **Corrosion Control with blended phosphate corrosion inhibitor** to make the water less corrosive so that lead and copper found in household plumbing and iron found in water mains does not dissolve into the water.

2006 Water Quality Testing Results

All drinking water, including bottled water, begins as rainfall or snowmelt. As this water travels over the surface of the land or through the ground it dissolves naturally occurring substances and may also pick up contaminants resulting from the presence of animals or human activity. Upon reaching a water supply, some of these substances and contaminants will be removed or reduced by natural processes. At the same time additional contaminants might directly enter the open waters of the supply. Treatment will reduce the levels of contaminants to a safe range and can effectively eliminate some substances but treatment processes will not remove all traces of all possible contaminants. **Thus, drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contamination. The presence of contaminants does not necessarily indicate that water poses a health risk.**

The following tables and descriptions provide a complete summary of all contaminants detected in Worcester's water in 2006.

Substance (Contaminant)	Maximum Level Detected	Range Detected	MCL	MCLG	Typical Source of Contaminant	Violation (Y/N)
MICROBIOLOGY						
Total Coliform Bacteria	3.6 % positive in April	0.0 – 3.6 % positive	Presence in >5.0% of monthly samples	0 positive	Naturally present in the environment.	No
INORGANIC CONTAMINANTS (IOC's)						
Barium	0.010 ppm	n/a	2 ppm	2 ppm	Discharge of drilling wastes; erosion of natural deposits.	No
Fluoride	0.08 ppm	n/a	4 ppm	4 ppm	Erosion of natural deposits; discharge from fertilizer and aluminum factories.	No
Sodium	9.9 ppm	n/a	Unregulated[1]- ORSG: 20 ppm	Unregulated[1]	Naturally present in the environment; road salt.	No
Sulfate	9.9 ppm	n/a	Unregulated[1]- SMCL: 250 ppm	Unregulated[1]	Naturally present in the environment.	No
VOLATILE ORGANIC CONTAMINANTS (VOC's)						
Chloromethane	0.69 ppb	n/a	Unregulated	Unregulated	Naturally present in the environment.	No
RADIOACTIVE CONTAMINANTS – 2003 data-no samples required in 2006						
Gross Alpha Activity	0.6 pCi/L	n/a	15 pCi/L	0 pCi/L	Erosion of natural deposits.	No
Beta Particle Activity	0.1 pCi/L	n/a	50 pCi/L[2]	0 pCi/L	Erosion of natural deposits.	No
Radium 226 & 228	0.4 pCi/L	n/a	5 pCi/L	0 pCi/L	Erosion of natural deposits.	No

[1]Unregulated means that USEPA has not set an MCL for this contaminant.
[2]The MCL for Beta Particles is 4 mrem/year. EPA considers 50 pCi/L to be the level of concern for Beta Particles.

Microbiological Contaminants

Total Coliform Bacteria are a group of bacteria that serve as indicators of potential water quality problems. Bacteria in the Total Coliform group are not necessarily harmful but, when detected in drinking water, may indicate that conditions are right for the presence of more harmful microorganisms. Total Coliform Bacteria are naturally present in soil, surface waters and vegetation. They are not, by themselves, indicative of sewage or human waste. Certain types of Total Coliform can survive in water distribution systems despite the presence of chlorine.

Fecal Coliform is a group of bacteria that thrive at warmer temperatures such as those found within the gut-tract of humans and warm-blooded animals. Whenever a Total Coliform Bacteria is detected in a water sample that same sample must be tested for Fecal Coliform. The presence of Fecal Coliform may be cause for concern since these organisms are sometimes, but not always, associated with sewage or human/animal waste. **No fecal coliform were found in Worcester's water in 2006.** The City of Worcester monitors for microbiological contaminants by collecting a minimum of 148 water samples in the City each month. Sampling sites are approved by the Massachusetts Department of Environmental Protection (DEP) and are spread throughout the City so that the water being tested is truly representative of that flowing from consumers' taps. A total of 1,841 samples were collected and analyzed for Total Coliform Bacteria in 2006. Since 1983, Worcester's water has complied with the MCL for Total Coliform in every month except August 1995 when 5.6% of the samples were positive. **Worcester's water has never exceeded the MCL for fecal coliform.**

Inorganic Contaminants (IOC's)

Inorganic contaminants (IOC's) include a variety of chemicals such as metals, nutrients and minerals. These chemicals can be naturally present in the rocks and soils surrounding a water supply or they might enter a water supply through rainfall runoff from streets, parking lots and farmland. Industrial waste and illegal dumping of hazardous waste are other potential sources of IOC's. Drinking water containing IOC's at levels above the MCL's may cause various health problems depending on the contaminant and the amount ingested. Health effects might include an increased risk of cancer, liver or kidney damage, nerve damage or intestinal problems. Worcester's water supply is annually tested for all IOC's by sampling the water after treatment but before it enters the distribution system. The contaminants detected were found at levels that are well below the MCL's and are not cause for concern. Worcester's water has never exceeded the MCL for any inorganic contaminants.

Volatile Organic Contaminants (VOC's)

Volatile Organic Contaminants (VOC's) are a group of 56 chemicals that are usually associated with man-made products such as gasoline, heating oil, degreasers, cleaners, solvents and the like. VOC's in a water supply can result from fuel spills, leaking underground tanks, industrial discharges, illegal dumping and runoff from industrial areas or heavily traveled roads. Worcester's water is tested once per year for VOC's by sampling after the water is treated but before it enters the distribution system. Other than the disinfection byproducts (see next page), the only VOC detected in 2006 was chloromethane. This is an unregulated contaminant with no MCL. While some chloromethane comes from industrial uses, it is estimated that 99% comes from natural sources with the majority formed in the ocean. Burning of wood, grass and coal also releases this VOC and some may be formed by chlorination of drinking water. The level of chloromethane found in Worcester's water in June 2006 was extremely low and was less than that typically found in air (1 ppb). **Worcester's surface water supplies have never exceeded MCL's for any VOC.**

*Radioactive Contaminants-*2003 data-no samples required in 2006.

Radioactive substances can be both natural and manmade. They can enter water supplies from atmospheric fallout, runoff, illegal disposal of radioactive waste, or from contact with natural deposits of radioactive materials such as radon and uranium.

Surface water supplies are less susceptible to contamination from natural deposits of radioactive materials than are groundwater systems. Since Worcester's reservoirs are not in an area of known sources of radioactive materials and have never had radioactive contaminants detected at a level of significance, our water must only be tested once every five years. Samples for radioactive contaminants are collected after treatment but before water enters the distribution system.

The contaminants found in the 2003 sample, Gross Alpha Particle Activity, Gross Beta Particle Activity and Radium 226 & 228 were measured near the detection level for the instrument. These levels are not cause for concern.

Synthetic Organic Contaminants (SOC's)

Synthetic organic contaminants are a large group of chemicals of man-made origin including pesticides, herbicides and various industrial materials that are used in manufacturing, agriculture and other applications. Worcester was not required to test for SOC's in 2006. We last tested in the second and fourth quarters of 2004 by collecting samples after treatment but before water entered the distribution system. **No SOC's were found in any of the samples collected**. Worcester's water supplies have never exceeded MCL's for any SOC.

Lead and Copper -2005/2006

Lead and copper are contaminants that have a very specific and unique set of rules for sampling and testing. Unlike other inorganics, which tend to contaminate a water supply at the source, lead and copper generally enter the water after it has flowed to the consumer's home. These metals typically dissolve from the water pipes within your house if the water is corrosive. Lead usually comes from the lead solder used, prior to 1986, to connect the copper tubing in a house's water supply lines. The copper comes from the tubing itself. Ingesting large amounts of copper from drinking water can upset your stomach but there are no long-term health effects unless you suffer from Wilson's Disease. Lead, on the other hand is known to cause learning impairments in young children and may cause delays in mental and physical development. Elevated lead ingestion may also cause kidney problems or high blood pressure in adults. Lead is therefore strictly regulated in drinking water. In past years gasoline and paint were major sources of lead in the environment.

Since both lead and copper enter the water at the point of use (near the tap) sampling and testing for these metals must be done at homes in the City rather than at the entry point to the distribution system. Samples had to be collected after the water went unused in the home for at least six hours. This permitted the maximum contact between water and the lead and copper. If the 90^{th} percentile results exceed the action level further sampling and possible treatment changes might be necessary.

For Lead and Copper compliance testing Worcester works cooperatively with the Elm Hill and Woodland Water Districts in Auburn, both of which purchase water from the City.

System	Contaminant	90th Percentile	Number of Samples Tested	Number of Samples Exceeding Action Levels	Action Level	MCLG
Combined Results for Worcester, Elm Hill and Woodland	Lead	8.3 ppb	110	7	15 ppb	0
	Copper	0.126 ppm	107	0	1.3 ppm	1.3 ppm
Worcester	Lead	8.3 ppb	94	5	15 ppb	0
	Copper	0.128 ppm	91	0	1.3 ppm	1.3 ppm
Elm Hill	Lead	119.2 ppb	11	2	15 ppb	0
	Copper	0.115 ppm	11	0	1.3 ppm	1.3 ppm
Woodland	Lead	1.6 ppb	5	0	15 ppb	0
	Copper	0.092 ppm	5	0	1.3 ppm	1.3 ppm

It should be noted that although Worcester has made great strides in reducing the corrosion of lead into drinking water there is still the possibility that some homes may have elevated lead in water taken from the tap after it has gone unused for many hours. Infants and young children are typically more vulnerable to lead in drinking water than the general population. It is possible that lead levels in your home may be higher than at other homes in Worcester as a result of materials used in your home's plumbing. If you are concerned about elevated lead levels in your home's water you may want to have your water tested. A simple solution to elevated lead in your water is to run the tap for 30 seconds to one minute before you use the water for drinking, cooking or making baby formula. This assures that you will be getting safe water from the water main and not the water that has been standing in your plumbing. Additional information is available from the Safe Drinking Water Hotline (800-426-4791).

Turbidity

Turbidity is a measure of the cloudiness of water. In filtered water supplies it is one of the most important measurements used to determine the effectiveness of filtration. A filtered system that exceeds the turbidity limits may have operational or mechanical problems that could result in unsafe drinking water. Turbidity itself is not harmful and does not cause illness. It is used to indicate whether other more dangerous contaminants such as bacteria or parasites might be present in the water.

Substance (Contaminant)	Maximum Turbidity Measured	Lowest Monthly % of Measurements Below Turbidity Limit	Number of Measurements Greater Than 1.0 NTU	Turbidity Limits (Combined for all filters)
Turbidity (Combined for all filters)	0.14 NTU	100%	0	Less than or equal to 0.3 NTU in 95% of monthly measurements; No measurement can exceed 1.0 NTU

The water in Worcester's reservoirs has an average turbidity of about 0.80 NTU (Nephelometric Turbidity Units). This number changes during the year since turbidity is influenced by factors such as the weather or algae growth. Once the water passes through the filters at the Worcester Water Filtration Plant the turbidity is much lower and at a consistent level throughout the year. The average turbidity of the water coming from the filters is about 0.05 NTU. Regardless of changes in the weather or seasons the treated water has remained within the turbidity limits.

Turbidity is measured continuously at each of the eight filters in the Water Filtration Plant and as the combined flow of all filters exits the plant. The combined filter turbidity determines compliance as indicated in the table. Turbidity is also measured continuously as water from the reservoirs enters the plant (untreated) and as the water leaves the clearwells (storage tanks for treated water) and enters the distribution system. Individual samples are also collected at various points in the water system for laboratory analysis of turbidity.

Under our new treatment system Worcester has never failed the standard for turbidity. Prior to the Water Filtration Plant Worcester's untreated water occasionally failed the old turbidity standard, most recently in 1987.

Disinfection and Disinfection Byproducts

Chlorine is a disinfectant used to kill bacteria and microorganisms in drinking water. Its use is recognized as one of the most important public health measures ever taken in the modern world. New federal regulations limit the maximum amount of residual chlorine that can be present in the distribution system to 4.0 ppm. At its highest level, **Worcester's water contains about one half of the maximum allowed.**

Substance (Disinfectant or Byproduct)	Maximum Level Detected (HRAA)[3]	Range Detected	MCL (MRDL)[4]	MCLG (MRDLG)[5]	Typical Source of Contaminant	Violation (Y/N)
Total Chlorine	1.19 ppm	0.0-2.3 ppm	4.0 ppm	4.0 ppm	Added during treatment.	No
Total Tri-halomethanes	44 ppb	21-72 ppb	80 ppb	--	Byproducts of chlorine disinfection.	No
Haloacetic Acids	31 ppb	1.0-49 ppb	60 ppb	--	Byproduct of chlorine disinfection.	No

[3]Highest Running Annual Average.
[4]Maximum Residual Disinfectant Level. See Glossary of Terms for definition.
[5]Maximum Residual Disinfectant Level Goal. See Glossary of Terms for definition.

Disinfection byproducts are organic compounds produced when chlorine reacts with naturally occurring organic matter. This reaction produces trihalomethanes, a group of four compounds. Total trihalomethanes are the combined concentrations of the four compounds. The individual compounds are not regulated. Haloacetic Acids are another class of disinfection byproducts that includes five (5) compounds. At levels exceeding the MCL, Trihalomethanes and Haloacetic Acids may increase the risk of certain cancers.

Trihalomethanes and Haloacetic Acids are monitored in Worcester through the collection and analysis of eight (8) samples taken each quarter at representative sites in the City. Compliance with the MCL is determined by a running average of four quarterly sample sets. Worcester's water has never exceeded the MCLs for Total Trihalomethanes or Haloacetic Acids.

Other Analysis

The compounds in this table are general measures of water chemistry. There are no established limits for these compounds since they are not recognized as having significant health effects at levels found in drinking water. These compounds are sometimes referred to as secondary contaminants. At certain levels some of these may discolor the water or create a bad taste. Many of these measurements are made as another way of tracking the effectiveness of Worcester's treatment processes.

Substance	Average in Distribution System	Range Detected in Distribution System	Typical Source of Contaminant
Alkalinity	9.9 ppm	6.4 - 15.4 ppm	Naturally occurring. Buffering capacity of water.
Aluminum	0.025 ppm	0.021 – 0.175 ppm	From natural sources and water treatment processes.
Calcium	8.6 ppm	4.5 - 11.2 ppm	From natural sources and water treatment processes.
Chloride	24 ppm	15 - 32ppm	Natural and manmade sources.
Conductivity	119 umhos/cm	97 – 142 umhos/cm	An indirect measure of dissolved solids.
Hardness	27 ppm	14 - 40 ppm	Naturally occurring. An indirect measure of Calcium & Magnesium
Iron	0.053 ppm	<0.03 – 0.768 ppm	From natural sources and old water mains.
Manganese	0.003 ppm	<0.003 – 0.298 ppm	From natural sources and water mains; similar to iron.
Orthophosphate	0.656 ppm	0.33 – 1.16 ppm	Added to water during treatment as corrosion inhibitor.
pH	7.5	7.0 – 8.4 pH units	Measure of the acidity or basicity of water.
Temperature	14 degrees Celsius	3 - 29 degrees Celsius	Natural processes.
Total phosphate	0.97 ppm	0.650 – 1.88 ppm	Added to water during treatment as corrosion inhibitor.
Zinc	0.007 ppm	0.003 – 0.028 ppm	From natural sources and some plumbing material

Cross Connection Control Program

A cross connection is an actual or potential interconnection between a drinking water line and any source of pollution or contamination such as a piping arrangement that allows drinking water to come in contact with non-drinkable water, chemicals, gases or other potentially harmful substances. Plumbing cross connections exist whenever a pipe carrying drinking water has a direct physical connection to a source of potentially harmful materials. Cross connections pose a public health threat since they can cause drinking water contamination in homes and buildings and lead to illness.

Plumbing cross connections can be found in all types of buildings including homes, factories, restaurants and hospitals to name a few. Some examples of common cross connections include:

- A water feed to a boiler
- A water line feed to a chemical tank
- A garden hose connected to an outside spigot on one end and submerged below the surface of a swimming pool on the other end.
- A garden hose with a fertilizer/pesticide spray attachment

Where cross connections exist there is the potential for drinking water contamination. If the water pressure in the water mains in the street were to drop due to a nearby water main break then back-siphonage can occur and contaminated water, say from a cross connected boiler, can be drawn into the water system where it could be ingested. If the pressure in the cross-connected device is higher than the water pressure, through backpressure, contaminants in the cross-connected device can be pushed into the drinking water. For instance, if a water line feeds a chemical tank at a factory and the tank is then pressurized the chemicals could be forced out through the water line into the drinking water. A cross connection can contaminate drinking water in the home where it is located or it can contaminate an entire neighborhood.

As public water suppliers we are required to take steps to help prevent drinking water contamination through cross connections. We must:

1. Look for cross connections in all commercial, industrial, municipal and institutional buildings through cross-connection surveys.
2. Where cross connections are found, notify the building owner and have them eliminate the cross connection or install a backflow preventer, a device that prevents contaminated water from flowing back into the water system.
3. Test backflow preventers on a regular basis to assure they work properly and order the owners to fix or replace those that fail.

In 2004 the Department of Environmental Protection (DEP) informed Worcester DPW Water Operations, through a Notice of Noncompliance (NON), that we were not doing enough to find cross connections. In order to correct this deficiency DPW retained the services of Weston and Sampson Engineers, Inc.to begin a multi-year comprehensive cross connection survey of every commercial, industrial, municipal and institutional building in Worcester to which we supply water. We estimate there are 3,839 such buildings that need to be surveyed. These are categorized as follows:

Facilities Requiring Cross Connection Surveys

Commercial	Industrial	Municipal	Institutional
2,290	438	217	894

The cross connection survey program began in earnest in April 2005. By the end of 2006 surveys had been completed as follows:

Cross Connection Surveys Completed Through 2006

Commercial	Industrial	Municipal	Institutional
862	102	136	256

We expect it will take another four years to complete surveys on all facilities. Afterwards we will begin again so that cross connection surveying will be an ongoing process.

Sooner or later DPW&P staff or consultants will be visiting your place of business to conduct a cross connection survey. Please understand that this is a necessary and very important program that protects you, your employees, customers and fellow residents and businesses of the City from potentially serious health impacts. Also know that if we identify a cross connection you will have to take steps to either eliminate it or install a backflow preventer to stop reverse flows into the drinking water. When a backflow preventer is installed it is subject to regular inspections and testing by certified staff at Worcester DPW&P Water Operations. A summary of our backflow preventer testing program in 2006 is shown below.

Backflow Preventer Testing 2006

Total Number of Reduced Pressure Backflow Preventers (RPBP) in Worcester (2006)	1024
Number of Reduced Pressure Backflow Preventers (RPBP) in Worcester **Tested in 2006**	1163
Total Number of Double Check Valve Assemblies (DCVA) in Worcester (2006)	503
Number of Double Check Valve Assemblies (DCVA) in Worcester **Tested in 2006**	411

One of the most common potential cross connections found in homes and businesses is through a hose bibb, or outside faucet. A hose with a fertilizer or pesticide spray applicator attached or with one end submerged in a pool or bucket of dirty water and connected to an outside faucet, could allow dangerous chemicals or bacteria to flow back into your water system if there is a pressure drop in the water main in your street. This problem can be easily and inexpensively corrected by installing a **hose bibb vacuum breaker** on the faucet. These devices are available at most plumbing supply, hardware and home improvement stores and simply screw onto the threaded outside faucet or slop sink faucet. They prevent backflow of contaminants into your home and protect you and your family. Don't take chances with cross connections-install a hose bibb vacuum breaker today!

For more information on Worcester DPWP Water Operations' Cross-Connection Control Program please call DPW&P Water Engineering at 508-799-1493.

City of Worcester
Department of Public Works & Parks
Water Operations
18 East Worcester Street
Worcester, MA 01604

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Η κατοθεν αναφορα ϖαρουσιαζη σωουδαιες πληροφορηες για το ποσιμο νερο σας. Παρακαλουμε να το μεταφρασετε, η να το σχολειασετε με καωοιον που το καταλαβαινη αωολητως.

Sprawozdanie zawlera ważne informacje na temat jakości wody w Twojej miejscowści. Poproś kogoś o przellurnaczenie go lub porozmawiaj z osoba która je dobrze rozumie.

Glossary of Terms

Action Level- The concentration of a contaminant that, if exceeded, triggers treatment or other requirements, which a water system must follow.	**ND**-Not detected; contaminants that are in concentrations too small to be detected by analytical instruments
Distribution System- The network of pipes and valves that carry water from the treatment plant to the homes and businesses where water is used.	**ORSG-**Office of Research & Standards guideline. Concentration of a chemical in drinking water, at or below which, adverse health effects are unlikely to occur after lifetime exposure. If exceeded it serves as an indicator of the potential need for further action.
Massachusetts Department of Environmental Protection (MassDEP)- The state agency responsible for setting and enforcing drinking water regulations in Massachusetts	**ppm-** parts per million; same as milligrams per liter (mg/L)
Maximum Contaminant Level (MCL)- The highest level of a contaminant in drinking water. MCL's are set as close to the MCLG's (see below) as feasible using the best available treatment technology.	**ppb-** parts per billion; same as micrograms per liter (ug/L)
Maximum Contaminant Level Goal (MCLG)- The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLG's allow for a margin of safety.	**SMCL-**Secondary maximum contaminant level are standards developed to protect the aesthetic quality of drinking water and are not health based
Maximum Residual Disinfectant Level (MRDL)- The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants	**Treatment Technique (TT)**- A required process intended to reduce the level of a contaminant in drinking water.
Maximum Residual Disinfectant Level Goal (MRDLG)- The level of a drinking water disinfectant below which there is no known expected risk to health. MRDLG's do not reflect the benefits of the use of disinfectants to control microbial contaminants.	**United States Environmental Protection Agency (USEPA)-** The federal agency responsible for setting and enforcing drinking water regulations
90th percentile-A statistical measure used in the Lead and Copper Rule. A test result at the 90th percentile level means that 90 percent of all the test results fall below that level.	**Watershed-** The land upon which rain falls then flows across as runoff that eventually collects into streams, rivers, lakes, ponds and reservoirs. Watershed boundaries are determined by the topography with hills or mountains determining which direction runoff will travel**.**

Additional copies of this report are available upon request

If you have questions about this report or if your group or organization would like to meet to discuss drinking water issues please call Philip Guerin, Director of Environmental Systems at 508-799-1484 or call the DPW&P Customer Service Center at 508-929-1300.