



Environmental
Protection

Michael R. Bloomberg, Mayor
Cas Holloway, Commissioner

New York City 2009 Drinking Water Supply and Quality Report



Pepacton Reservoir Stream

New York City's Water Supply System





Dear Friends:

New York City's upstate watershed is one of our country's greatest natural resources, delivering more than one billion gallons of clean and great-tasting drinking water to over nine million people every day.

The upstate water supply has had a significant impact on the development of our City, helping to drive our economic growth and prosperity while dramatically improving public health. And as our City continues to grow, the reliability of our water supply is more important than ever.

New York City's water has won many accolades for its purity and taste, and maintaining that quality is one of our Administration's top priorities. That's why we continue to purchase thousands of acres upstate to expand our watershed's capacity and to invest in developing a third water tunnel to enhance our delivery system. And every day, New York City employees work hard to make sure that homes and businesses continue to have access to this critical resource.

This report outlines the programs our City has developed to protect and improve our water supply, and to make sure that New York's water remains some of the best in the world.

Sincerely,



Michael R. Bloomberg, Mayor



Delivering more than 1 billion gallons of great-tasting, award-winning drinking water every day is complicated work, and New York City and the Department of Environmental Protection are up to the challenge.

Mayor Bloomberg has made investment in the City's critical infrastructure a top priority, and we are in the midst of the most significant investments in our water system in at least a generation. In fact, by 2013, the way drinking water is delivered to your home will change dramatically because of projects under construction right now. The \$2.8 billion water filtration plant under construction beneath Van Cortlandt Park will enable DEP to deliver 300 million gallons per day of filtered water from the Croton watershed, and the Ultraviolet Disinfection Facility just south of Kensico Reservoir will have the capacity to disinfect 2,020 million gallons per day of water from the Catskill and Delaware watersheds.

These investments, and the many thousands of acres we've purchased and easements we've acquired in the City's watershed, will go a long way to ensuring the integrity of our pristine water supply for decades to come. Still, we don't take anything for granted. The City performs more than 330,000 tests each year to ensure that our water meets all state and federal standards. This report focuses on some of the key accomplishments we've made in managing our vast and ingenious water supply and distribution system. The successes highlighted here would not have been possible but for the expertise, hard work, and dedication of more than 5,800 DEP employees who make the system run every day, and I thank them for their continued service.

Sincerely,



Cas Holloway, Commissioner



NEW YORK CITY 2009 DRINKING WATER SUPPLY AND QUALITY REPORT

The New York City Department of Environmental Protection (DEP) is pleased to present its 2009 Annual Water Supply and Quality Report. This report was prepared in accordance with Part 5-1.72 of the New York State Sanitary Code (10NYCRR), and the National Primary Drinking Water Regulations, 40 CFR Part 141 Subpart O, of the United States Environmental Protection Agency (EPA), which require all drinking water suppliers to provide the public with an annual statement describing the water supply and the quality of its water.

New York City's Water Supply

The New York City surface (reservoir) water supply system provides approximately 1.0 billion gallons of safe drinking water daily to over 8 million residents of New York City, to the millions of tourists and commuters who visit the City throughout the year, as well as approximately 120 million gallons a day to the one million people living in Westchester, Putnam, Ulster, and Orange counties. In all, the City Water Supply System provides nearly half the population of New York State with high quality water.

Source of New York City's Drinking Water

New York City's surface water is supplied from a network of 19 reservoirs and three controlled lakes in a 1,972 square-mile watershed that extends 125 miles north and west of New York City. Due to the City's ongoing efforts to maintain the appropriate volume and high quality of water in the distribution system, there is some rotation in the water sources used by DEP. In 2009, 100% of our water came from the Catskill/Delaware System (Public Water System Identification Number – PWSID NY7003493), located in Delaware, Greene, Schoharie, Sullivan, and Ulster counties, west of the Hudson River. The Croton System (PWSID NY7003666), the City's original upstate supply, made up of 12 reservoir basins in Putnam, Westchester, and Dutchess counties, and the Groundwater System (PWSID NY7011735) in southeastern Queens, were both off-line for the entire 2009 calendar year. For regulatory reporting purposes, in 2010 the three sources have been consolidated to

one, PWSID NY7003493, now called the New York City Water Supply System.

Regulation of Drinking Water

The sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally occurring minerals and, in some cases, radioactive material and can pick up substances resulting from the presence of animals or from human activities. Contaminants that may be present in source water include: microbial contaminants, inorganic contaminants, pesticides and herbicides, organic chemical contaminants, and radioactive contaminants.

In order to ensure that tap water is safe to drink, the New York State Department of Health (NYSDOH) and EPA prescribe regulations that limit the amount of certain contaminants in water provided by public water systems. The State Health Department's and the federal Food and Drug Administration's (FDA) regulations establish limits for contaminants in bottled water which must provide the same protection for public health.

Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the EPA's Safe Drinking Water Hotline at (800) 426-4791.



Ensuring a Safe, Reliable and Sufficient Water Supply

Source Water Assessment Program

The Safe Drinking Water Act (SDWA) Amendments of 1996 required states to develop and implement Source Water Assessment Programs (SWAP) to: identify the areas that supply public tap water; inventory contaminants, and assess water system susceptibility to contamination; and inform the public of the results. The SDWA gave states a great deal of flexibility on how to implement SWAP. These assessments were to be created using available information, and to help estimate the potential for source water contamination. Elevated susceptibility ratings do not mean that source water contamination has or will occur in the water supply; rather, they indicate the need for water suppliers to implement additional precautionary measures.

Starting in 1993 and culminating in 1997 with the historic New York City Watershed Memorandum of Agreement and the Filtration Avoidance Determination (FAD), New York City began implementation of a series of programs to reduce the susceptibility of the surface water supply to contamination from a variety of sources. These programs, which are still ongoing, operate under the close scrutiny of both the NYSDOH and the EPA. Due to these efforts, further detailed below, the SWAP methodologies applied to the rest of the state were not applied to the New York City water supply by NYSDOH.

Watershed Protection Programs

10-Year Filtration Avoidance Determination from EPA

2009 marked the second year of DEP's implementation of the latest 10-year FAD, covering 2007 to 2017, issued by EPA in July of 2007. The FAD is based on the Long-term Watershed Protection Program DEP submitted in December 2006, and describes enhancements to existing watershed protection programs as well as the development of several new efforts. More information

on the program and on other watershed issues can be found on DEP's web site at www.nyc.gov/watershed.

The FAD maintains New York City's status as one of only five large cities in the country with drinking water of such high quality that it is not required to filter. In the 2007 FAD, DEP agreed to enhance our commitment toward acquiring undeveloped land in the Catskill/Delaware watershed, as a means of watershed protection; and a total of \$300 million was allocated for this purpose, to be spent over a 10 year period. DEP is also expanding existing relationships with various land trusts in order to facilitate purchases of eligible land.

Key programs and selected accomplishments include:

- Land Acquisition - New York City buys real property interests from willing sellers, to further protect and buffer its 19 reservoirs and controlled lakes in the Catskill/Delaware and Croton watersheds. Since 1997, DEP has purchased more than 102,000 acres of land or easements, adding to the 45,000 acres the City owned in 1997.
- Land Management - With the acquisition of land over the past 13 years, the City has become one of the largest landowners in the watershed region. These properties must be managed to ensure that water quality is protected. Since 1997, DEP has increased the acreage of land open for recreation every year, and approximately 59,000 acres are now available for fishing, hiking, hunting, trapping, cross-country skiing and other passive activities.
- Partnership Programs - Many of the City's watershed protection programs west of the Hudson River are administered by the Catskill Watershed Corporation (CWC), a non-profit corporation formed for this purpose. Together DEP and CWC have addressed more than 3,200 failing septic systems and authorized the construction of more than 70 stormwater control measures to address existing stormwater runoff.



The City has also funded the construction of new community wastewater solutions for more than a dozen watershed communities.

- Wastewater Treatment Plant (WWTP) Upgrades – More than 100 non-City-owned WWTPs in the watershed are being upgraded to provide state-of-the-art treatment of pathogens and substantially reduce nutrients in their waste streams. Plants generating 99% of the west-of-Hudson WWTP flow have been upgraded. In the Croton Watershed, plants producing 87% of the flow have been fully upgraded.
- Streams, Farms and Forestry Programs – The Stream Management Program (SMP) is a partnership program founded to encourage the long-term stewardship of streams and floodplains in the west-of-Hudson watershed. The Watershed Agricultural Program and Watershed Forestry Program both represent long-term successful partnerships between DEP and the not-for-profit Watershed Agricultural Council (WAC). The underlying goal of both programs is to support and maintain well-managed family farms and working forests as beneficial land uses for water quality protection and rural economic viability. Together, these partnerships work with watershed residents to identify and eliminate potential pollution sources.

Capital Investment

Catskill/Delaware UV Facility

On January 5, 2006 EPA published the Long Term 2 Enhanced Surface Water Treatment Rule (LT2ESWTR) to improve control of microbial pathogens. New York City designed an ultraviolet (UV) light disinfection plant for the Catskill/Delaware System that will comply with the requirements of the LT2ESWTR. Construction of the facility began in 2008, and it is expected to be completed in 2012. The plant is located at the New York City-owned Eastview site, a 153-acre property situated in the towns of Mount Pleasant and

Greenburgh in Westchester County, New York. The UV Facility will consist of fifty-six 40-million-gallon-per-day UV Disinfection Units and is designed to disinfect a maximum of 2.4 billion gallons of water per day. The plant will provide an additional barrier of microbiological protection by inactivating potentially harmful organisms, such as *Cryptosporidium* and *Giardia*. This treatment will supplement DEP's existing microbial disinfection programs.

Croton Water Filtration Plant

The City's goals are to ensure that water from all three of its water supply systems is at all times protected against microbiological contamination, is aesthetically pleasing, and meets all drinking water quality standards. With respect to the Croton System, the City is proceeding with the construction of a filtration plant for Croton System water, pursuant to the terms of a November 1998 federal court Consent Decree entered into with the United States and the state of New York, as amended by a 2004 Second Supplement to the Consent Decree. The filtration plant is expected to reduce color levels, the risk of microbiological contamination, and disinfection byproduct levels in Croton System water. The filtration plant will also ensure compliance with stricter water quality standards. In September 2004, the City issued a notice to proceed for the first phase of construction of the Croton Water Filtration Plant at the Mosholu Golf Course site in Van Cortlandt Park in the Bronx. In August 2006 and August 2007, the second and third phases went forward. Construction work at the site continues to make progress: pipe installation is ongoing in the Treated Water Tunnels and the Raw Water Tunnel is almost complete; concrete placement, installation of mechanical piping and electrical work at the site is advancing. In addition, work off-site at the Treated Water Shafts at Jerome Park Reservoir continues. DEP expects to commence operation of the filtration plant in 2012.



As part of an agreement between the City and the Parks Department, more than \$200 million generated from water and sewer revenues is being spent on improvements to more than 70 Bronx Parks and recreational facilities. DEP also operates a community outreach office adjacent to the Mosholu site. The office, located at 3660 Jerome Avenue, Bronx, New York, is open Monday through Friday from 9 AM to 5 PM. For more information, the telephone number of the center is (718) 231-8470.

The City remains committed to maintaining a comprehensive watershed protection program for the Croton System. Until DEP begins to filter Croton water, we are required to make the following statement: *Inadequately treated water may contain disease-causing organisms. These organisms include bacteria, viruses, and parasites, which can cause symptoms such as nausea, cramps, diarrhea, and associated headaches.*

City Water Tunnel No. 3

City Water Tunnel No. 3 is being built in stages and is one of the largest capital projects in New York City's history. Begun in 1970, City Water Tunnel No. 3 will enhance and improve the City's water delivery system, and allow for the inspection and repair of City Water Tunnels No. 1 and No. 2 for the first time since they were put into service, in 1917 and 1936, respectively. The 13-mile Stage 1 section of City Water Tunnel No. 3 went into service in August 1998. It runs from Hillview Reservoir in Yonkers, through the Bronx, down Manhattan across Central Park, and into Astoria, Queens. Stage 2 of City Water Tunnel No. 3 consists of the Brooklyn/Queens leg and the Manhattan leg. The Brooklyn/Queens leg is a 5.5-mile section in Brooklyn that connects to a 5-mile section in Queens. The Brooklyn/Queens leg of the tunnel was completed in May 2001; however several shafts still need to be constructed before activation. Expected to be online by 2020, the Brooklyn/Queens leg, will deliver water to Staten Island, Brooklyn and Queens. Tunneling on the Manhattan portion of Stage

2 began in 2003 and was completed in 2008. Almost nine miles were excavated and lined with concrete. In addition, 10 new supply shafts have been constructed on the Manhattan leg that will integrate the new tunnel section with the existing distribution system. Work on the distribution chambers, which are underground facilities atop the shafts, continues and should be completed in late 2012. The Manhattan leg is expected to begin water delivery in late 2013. Facility planning and conceptual design for Stage 3 of the tunnel was completed in 2009. Stage 3, referred to as the Kensico-City Tunnel (KCT) anticipates construction of a 16-mile section that extends from the Kensico Reservoir to a valve chamber in the Bronx.

Hillview Reservoir

Due to violations of the Total Coliform Rule (TCR) in the distribution system in 1993 and 1994 that were attributed to conditions at Hillview Reservoir (Reservoir), DEP entered into a 1996 Administrative Order (AO) with NYSDOH, which required DEP to complete four activities: 1) remove sediment from the Reservoir; 2) install or construct a cover over the Reservoir; 3) undertake a biofilm research study of the distribution system; and 4) implement various operational changes at the Reservoir. The AO was modified in 1997 requiring DEP to raise the dividing wall in the Reservoir. DEP completed all of the action items stipulated in the AO except for construction of a cover. However, DEP instituted an improvements program comprised of facility and operational modifications, designed to prevent a recurrence of the TCR violations. The improvements included: increasing the chlorine residual in the basins of the Reservoir, developing and updating Standard Operating Procedures, and initiating an avian (bird) deterrent program. Significant capital projects were also completed, including improvements to chemical addition facilities and site security. Other capital projects are planned that go beyond those mandated in the AO. The AO was modified again in

Old Water Meter and New Water Meter with AMR Transmitter



1999 because DEP did not commence construction of the cover according to the schedule set forth in the AO. DEP requested, and NYSDOH agreed, to DEP's request to modify the timetable for cover construction.

The current AO was signed in February 2008 and requires DEP to complete cover construction for the Reservoir's East Basin by June 30, 2014, and the West Basin by October 31, 2016. DEP submitted design modifications for the cover and met the March 31, 2010 milestone, as required under the AO. In August 2009, DEP submitted a request to EPA and NYSDOH to modify the cover construction schedule until DEP completes certain critical water supply improvements that will mitigate the inherent risks to water supply delivery during construction of the cover. EPA, NYSDOH, and DEP are currently involved in negotiations concerning this modification request.

Groundwater System Enhancements

DEP continues to develop plans for a new state-of-the-art groundwater treatment plant to replace DEP's existing facility located at Station 6 in Jamaica, Queens. Final design for the facility is expected to be completed in 2014 and construction is expected to be completed in 2019. Once built, Station 6 will provide between 10 and 12 million gallons per day of high-quality drinking water.

Water Conservation

The average single family household in New York City uses on average 80,000 gallons of water each year, at a cost of \$2.31 per 100 cubic feet of water (748 gallons), or about \$247 each year. Since virtually all City residences receive wastewater collection and treatment services in addition to water service, the combined annual water and sewer charge for the typical NYC household using 80,000 gallons per year is \$640, consisting of \$247 for water service and \$393 for wastewater services (based on the FY 2009 rates).

New York City is fortunate to have reasonably priced drinking water; however, everyone should do their part to conserve this precious resource. Sustainability is important. AMR (Automated Meter Reading) is DEP's program to upgrade its meter reading capabilities which will allow customers to monitor their consumption daily and more effectively manage their accounts. All New Yorkers are encouraged to observe good water conservation habits, and are required to obey the City's year-round water use restrictions, which include a prohibition on watering sidewalks and lawns between November 1 and March 31, and between 11 AM to 7 PM from April 1 to October 31. It is illegal to open fire hydrants at any time. You can help save water by ordering a Home or Apartment Water Saving Kit by calling 311. If you are an apartment building owner/manager or a homeowner, you can obtain a free leak survey by calling DEP's Leak survey contractor at (718) 326-9426 for information. You can also go to www.nyc.gov/dep, click on "more services" in the Customer Services Box, and fill-out and send in the order forms to the person listed.

Water Treatment

Drinking water entering New York City's distribution system is treated with chlorine, fluoride, food grade phosphoric acid and, in some cases, sodium hydroxide. New York City uses chlorine to meet the New York State Sanitary Code SDWA disinfection requirements. Fluoride, added since 1966, at a concentration of one part per million, in accordance with the New York City Health Code, helps prevent tooth decay. Phosphoric acid is added to create a protective film on pipes that reduces the release of metals such as lead from household plumbing. Sodium hydroxide is added to Catskill/Delaware water to raise the pH and reduce corrosivity.

For the entire 2009 calendar year no wells were in operation. When the Groundwater System is online, DEP has the ability to apply a sequestering agent at



several wells to prevent the precipitation of naturally occurring minerals, mostly iron and manganese, in the distribution mains and customers' household piping. Air stripper facilities also can be operated at several wells to remove volatile organic chemicals.

Fluoride

DEP is one of the many drinking water systems in New York State that treats drinking water with a controlled, low level of fluoride for consumer dental health protection. According to the United States Centers for Disease Control and Prevention (CDC), fluoride is very effective in preventing cavities when present in drinking water at an optimal range of 0.8 to 1.2 mg/L. The New York City Health Code requires a fluoride concentration of 1.0 mg/L, with an acceptable range of 0.9 to 1.1 mg/L. To ensure that the fluoride supplement in your water provides optimal dental protection, NYSDOH requires that we monitor fluoride levels on a daily basis. In 2009, none of the monitoring results showed fluoride at levels that approach the 2.2 mg/L maximum contaminant level (MCL) for fluoride.

During 2009, fluoride was not continuously supplied in the Catskill/Delaware System due to repair work on the fluoride feed system. Fluoridation on the Catskill System was offline over 17% of the time with the longest period of fluoridation interruption being approximately 43 days, from July 25, 2009 through September 6, 2009, due to a silica build up in the acid solution pipe. Fluoridation on the Delaware System was offline 16% of the time with the longest period of fluoridation interruption being approximately 23 days, from September 22, 2009 through October 15, 2009, also due to a silica build up in the acid solution pipe. NYSDOH Bureau of Dental Health has indicated that a brief interruption of fluoridation to the Catskill/Delaware System is not expected to have a significant impact on dental health. Interruption of fluoridation in 2009 did not require public notification.

Operational Changes

Water from the Croton and Groundwater Systems was not fed into distribution for the entire 2009 calendar year. Operational information for the Groundwater System can be found at www.nyc.gov/dep/groundwater. The map on the inside front cover represents the Catskill/Delaware, Croton, and Groundwater service areas. This map depicts the Croton and Groundwater service areas when they are in operation.

Drinking Water Quality

DEP's water quality monitoring program – far more extensive than required by law – demonstrates that the quality of New York City's drinking water remains high and meets all health-related state and federal drinking water standards.

Drinking Water Sampling and Monitoring

DEP monitors the water in the distribution system, the upstate reservoirs and feeder streams, and the wells that are the sources for the City's supply. Certain water quality parameters are monitored continuously as the water enters the distribution system, and water quality is regularly tested at sampling points throughout the entire City. DEP is required to monitor drinking water for various parameters on a regular basis. DEP conducts analyses for a broad spectrum of microbiological, chemical, and physical measures of quality. Samples are collected at a frequency prescribed by the state. In 2009, DEP collected more than 27,270 samples from the City's distribution system and performed more than 330,162 analyses, and met all state and federal sampling requirements. Results of this regular monitoring are an indicator of whether or not drinking water meets health standards.

DEP conducts most of its distribution water quality monitoring at approximately 1,000 fixed sampling stations throughout the City. These stations, visible



in many neighborhoods, allow DEP to collect water samples throughout the distribution system in an efficient and sanitary manner.

Test Results

The results of the tests conducted in 2009 on distribution water samples under DEP's Distribution System Monitoring Program are summarized in the tables in this Report. These tables reflect the compliance monitoring results for all regulated and nonregulated parameters. The tables present both the federal and state standard for each parameter (if applicable), the number of samples collected, the range of values detected, the average of the values detected, and the possible sources of the parameters. The monitoring frequency of each parameter varies and is parameter specific. All data presented are for the Catskill/Delaware System, which in 2009 was the only source of water citywide. (The Croton and Groundwater Systems were not in service in 2009). Those parameters monitored, but not detected in any sample, are presented in a separate box. The state requires monitoring for some parameters less than once per year because the concentrations of these parameters do not change frequently. Accordingly, some of this data, though representative, are more than one year old.

Lead in Drinking Water

New York City water is virtually lead-free when it is delivered from the City's upstate reservoir systems, but water can absorb lead from solder, fixtures, and pipes found in the plumbing of some buildings or homes. Under the federal Lead and Copper Rule (LCR), mandated at-the-tap lead monitoring is conducted at selected households located throughout the City. In 2009, based on the results of this monitoring, the 90th percentile did not exceed 15 µg/L, the established standard or Action Level for lead. The at-the-tap monitoring results are also presented in a separate table in this Report. At

the request of NYSDOH, in 2009 DEP completed the replacement of all known City-owned lead service lines (LSLs), replacing four LSLs at City-owned properties.

If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. DEP is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. If you are concerned about lead in your water, you may wish to have your water tested. DEP offers a Free Residential Lead Testing Program which allows all New York City residents to have their tap water tested at no cost. To request a free kit to test for lead in your drinking water, call 311 or (212) NEW-YORK.

If you wish to learn more about lead in drinking water, testing methods, and steps you can take to minimize exposure, information is available from the Safe Drinking Water Hotline (800) 426-4791 or at www.epa.gov/safewater/lead.

Monitoring for Cryptosporidium and Giardia

In 1992, the City started a comprehensive program to monitor its source waters and watersheds for the presence of *Cryptosporidium* and *Giardia*. While there is no evidence that the illnesses cryptosporidiosis or giardiasis have been attributed to the New York City water supply, federal and New York State law requires all water suppliers to notify their customers about the potential risks of *Cryptosporidium* and *Giardia*. Cryptosporidiosis and giardiasis are intestinal illnesses caused by microscopic pathogens, which can be waterborne. Symptoms of infection include nausea,

City Water Tunnel No.3 Shaft Construction



diarrhea, and abdominal cramps. Some people may be more vulnerable to disease causing microorganisms or pathogens 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 from their health care providers about their drinking water. Since 1992, samples have been collected weekly from the effluents of the Kensico and New Croton Reservoirs, before water is chlorinated in the Catskill/Delaware and Croton Systems, respectively. The test methods, however, are limited in that they do not allow DEP to determine if organisms identified are alive or capable of causing disease.

From January 1 to December 31, 2009, a total of 104 routine samples were collected and analyzed for *Cryptosporidium* oocysts and *Giardia* cysts at the Kensico Reservoir effluents, and 52 routine samples were collected at the New Croton Reservoir effluent. Samples were analyzed using Method 1623 HV (US EPA). Of the 104 routine Kensico Reservoir effluent samples, five were positive for *Cryptosporidium* (0 to 1 oocysts/50L), and 82 were positive for *Giardia* (0 to 8 cysts/50L). Of the 52 routine New Croton Reservoir effluent samples, four were positive for *Cryptosporidium* (0 to 3 oocysts/50L), and 22 were positive for *Giardia* (0 to 4 cysts/50L). DEP's *Cryptosporidium* and *Giardia* data from 1992 to the present, along with weekly updates, can be viewed on the DEP website at: www.nyc.gov/html/dep/html/drinking_water/pathogen.shtml.

DEP's Waterborne Disease Risk Assessment Program conducts active surveillance for cryptosporidiosis and giardiasis to track the incidence of illness and determine all possible causes, including tap water consumption. No cryptosporidiosis or giardiasis outbreaks have been

attributed to tap water consumption in New York City. EPA/CDC guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium*, *Giardia* and other microbial contaminants are available from the EPA's Safe Drinking Water Hotline at (800) 426-4791.

Monitoring for Pharmaceutical and Personal Care Products (PPCPs)

In response to the issue of emerging contaminants in drinking water, including those classified as PPCPs, DEP conducted a one-year occurrence study in 2009 to test for the presence of a target group of PPCPs in the source waters of the New York City Water Supply. Although there are currently no state or federal mandatory testing or reporting requirements for PPCPs, DEP is being proactive in PPCP data collection in an effort to better understand the occurrence and potential human health consequences of PPCPs in our waterways.

The PPCP Monitoring Program was initiated in January 2009 with drinking water samples collected each quarter from the Catskill, Delaware, and Croton untreated source waters. DEP relied on newly developed and highly sensitive analytical methods to analyze the source water samples for a suite of compounds that is representative of PPCPs in surface and groundwater sources, as well as effluent from wastewater treatment plants. Due to the extremely low detection levels of these compounds, DEP implemented strict quality control requirements for field sampling and laboratory analysis. The results of this pilot study will be used to help assess whether additional monitoring or other measures are needed. A summary of DEP's PPCP occurrence study can be found at www.nyc.gov/html/dep/pdf/quality/nyc_dep_2009_ppcp_report.pdf, or consumers can request a copy of the report summary by calling 311.

New York City Drinking Water Quality Testing Results 2009

Detected Parameters

PARAMETERS	NYSDOH MCL	USEPA MCLG	CATSKILL/DELAWARE SYSTEM			SOURCES IN DRINKING WATER
			# SAMPLES	RANGE	AVERAGE	
CONVENTIONAL PHYSICAL AND CHEMICAL PARAMETERS						
Alkalinity (mg/L CaCO ₃)	-		332	10.8 - 16.7	12.9	Erosion of natural deposits
Aluminum (µg/L)	50 - 200 ⁽¹⁾		325	9 - 48	19	Erosion of natural deposits
Barium (mg/L)	2	2	325	0.013 - 0.024	0.018	Erosion of natural deposits
Calcium (mg/L)	-		333	5.1 - 6.6	5.5	Erosion of natural deposits
Chloride (mg/L)	250		324	8 - 13	11	Naturally occurring; road salt
Chlorine Residual, free (mg/L)	4 ⁽²⁾		14604	0.00 - 1.47	0.62	Water additive for disinfection
Color - distribution system (color units - apparent)	-		13520	4 - 100	6	Presence of iron, manganese, and organics in water
Color - entry points (color units - apparent)	15 ⁽³⁾		1087	4 - 12	6	Presence of iron, manganese, and organics in water
Copper (mg/L)	1.3 ⁽⁴⁾	1.3	333	0.003 - 0.142	0.009	Corrosion of household plumbing systems; erosion of natural deposits; leaching from wood preservatives
Corrosivity (Langelier index)	0 ^(1,5)		324	-2.94 to -1.89	-2.41	
Fluoride (mg/L)	2.2 ⁽³⁾	4.0	1475	ND - 1.36	0.83	Erosion of natural deposits; water additive which promotes strong teeth; runoff from fertilizer
Hardness (mg/L CaCO ₃)	-		325	17 - 23	19	Erosion of natural deposits
Hardness (grains/gallon[US]CaCO ₃) ⁽⁶⁾	-		325	1.0 - 1.3	1.1	Erosion of natural deposits
Iron (µg/L)	300 ⁽⁷⁾		325	20 - 110	40	Naturally occurring
Lead (µg/L)	15 ⁽⁴⁾	0	333	ND - 22 ⁽⁸⁾	0.6	Corrosion of household plumbing systems; erosion of natural deposits
Magnesium (mg/L)	-		325	1.0 - 1.6	1.2	Erosion of natural deposits
Manganese (µg/L)	300 ⁽⁷⁾		325	9 - 61	19	Naturally occurring
Nitrate (mg/L nitrogen)	10	10	324	0.06 - 0.21	0.13	Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits
pH (pH units) ⁽⁹⁾	6.5 - 8.5 ⁽¹⁾		14604	6.8 - 9.2	7.2	
Phosphate, Ortho- (mg/L)	-		14604	0.40 - 3.04	1.98	Water additive for corrosion control
Potassium (mg/L)	-		325	0.5 - 0.7	0.5	Erosion of natural deposits
Silica [silicon oxide] (mg/L)	-		324	1.7 - 3.4	2.5	Erosion of natural deposits
Sodium (mg/L)	NDL ⁽¹⁰⁾		325	7 - 11	9	Naturally occurring; road salt; water softeners; animal waste
Specific Conductance (µS/cm)	-		14584	69 - 117	85	
Strontium (µg/L)	-		325	18 - 27	20	Erosion of natural deposits
Sulfate (mg/L)	250		324	4.3 - 5.0	4.7	Naturally occurring
Temperature (°F)	-		14607	35 - 79	54	
Total Dissolved Solids (mg/L)	500 ⁽¹⁾		324	33 - 67	49	Metals and salts naturally occurring in the soil; organic matter
Total Organic Carbon (mg/L carbon)	-		324	1.4 - 1.8	1.6	Organic matter naturally present in the environment
Turbidity ⁽¹¹⁾ - distribution system (NTU)	5 ⁽¹²⁾		13520	0.35 - 22.5	1	Soil runoff
Turbidity ⁽¹¹⁾ - source water (NTU)	5 ⁽¹³⁾				3.6	Soil runoff
UV 254 Absorbency (cm ⁻¹)	-		324	0.024 - 0.038	0.03	Organic matter naturally present in the environment
Zinc (mg/L)	5		325	ND - 0.023	<0.005	Naturally occurring
ORGANIC PARAMETERS						
Specified Organic Chemicals detected:						
Dalapon (µg/L)	50		252	ND - 1.03	ND	Runoff from herbicide used on rights of way
Disinfection By-Products detected:						
Bromochloroacetic acid (µg/L)	50		252	ND - 2.41	1.42	By-product of drinking water chlorination
Chloral Hydrate (µg/L)	50		16	1.7 - 9.7	6.0	By-product of drinking water chlorination
Chloropicrin (µg/L)	50		16	0.4 - 0.6	0.5	By-product of drinking water chlorination
Haloacetonitriles (HANs) (µg/L)	50		16	1.3 - 3.1	2.5	By-product of drinking water chlorination
Halogenated ketones (HKs) (µg/L)	50		16	1.8 - 3.5	2.5	By-product of drinking water chlorination
Total Organic Halogen (µg/L)	-		297	120 - 256	172	
CATSKILL-DELAWARE SERVICE AREA ⁽¹⁴⁾						
Haloacetic acid 5 (HAA5) (µg/L)	60 ⁽¹⁵⁾		204	22 - 72	43	By-product of drinking water chlorination
Total Trihalomethanes (µg/L)	80 ⁽¹⁵⁾		216	12 - 71	43	By-product of drinking water chlorination
CROTON SERVICE AREA ⁽¹⁴⁾						
Haloacetic acid 5 (HAA5) (µg/L)	60 ⁽¹⁵⁾		28	28 - 63	46	By-product of drinking water chlorination
Total Trihalomethanes (µg/L)	80 ⁽¹⁵⁾		48	21 - 69	49	By-product of drinking water chlorination
GROUNDWATER SERVICE AREA ⁽¹⁴⁾						
Haloacetic acid 5 (HAA5) (µg/L)	60 ⁽¹⁵⁾		20	29 - 39	30	By-product of drinking water chlorination
Total Trihalomethanes (µg/L)	80 ⁽¹⁵⁾		60	19 - 59	35	By-product of drinking water chlorination

Detected Parameters (continued)

MICROBIAL PARAMETERS								
PARAMETERS	NYSDOH MCL	USEPA MCLG	CITYWIDE DISTRIBUTION					SOURCES IN DRINKING WATER
			# SAMPLES	RANGE	# SAMPLES POSITIVE	AVERAGE	HIGHEST MONTH % POSITIVE	
Total Coliform Bacteria (% of samples positive/month)	5%	0	10043	-	28	-	1.56%	Naturally present in the environment
<i>E. coli</i> (MPN/100mL)	(16)	0	10043	-	0	-	0.0%	Human and animal fecal waste
Heterotrophic Plate Count (CFU/mL)	TT	-	4913	ND - 5700	377	2	-	Naturally present in the environment

LEAD AND COPPER RULE SAMPLING AT RESIDENTIAL WATER TAPS: JANUARY TO DECEMBER 2009							
PARAMETER	NYSDOH AL	USEPA MCLG	# SAMPLES	RANGE	90 th PERCENTILE VALUES	# SAMPLES EXCEEDING AL	SOURCES IN DRINKING WATER
Surface Water Service Area							
Copper (mg/L)	1.3	1.3	172	0.010 - 0.458	0.219	0	Corrosion of household plumbing systems
Lead (µg/L)	15	0	172	ND - 96.4	10	9	Corrosion of household plumbing systems
Groundwater Service Area							
Copper (mg/L)	1.3	1.3	70	0.010 - 1.633	0.244	1	Corrosion of household plumbing systems
Lead (µg/L)	15	0	70	ND - 144.9	6	4	Corrosion of household plumbing systems

Not Detected Parameters

UNDETECTED CONVENTIONAL PHYSICAL AND CHEMICAL PARAMETERS
Antimony, Arsenic, Asbestos, Beryllium, Cadmium, Chromium, Cyanide, Foaming Agents, Lithium, Mercury, Nickel, Nitrite, Selenium, Silver, Thallium, Gross Alpha, Gross Beta, Radium 228
UNDETECTED ORGANIC PARAMETERS
Principal Organic Contaminants not detected:
Benzene, Bromobenzene, Bromochloromethane, Bromomethane, n-Butylbenzene, sec-Butylbenzene, tert-Butylbenzene, Carbon Tetrachloride, Chlorobenzene, Chloroethane, Chloromethane, 2-Chlorotoluene, 4-Chlorotoluene, Dibromomethane, 1,2-Dichlorobenzene, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, Dichlorodifluoromethane, 1,1-Dichloroethane, 1,2-Dichloroethane, 1,1-Dichloroethene, cis-1,2-Dichloroethylene, trans-1,2-Dichloroethylene, 1,2-Dichloropropane, 1,3-Dichloropropane, 2,2-Dichloropropane, 1,1-Dichloropropene, cis-1,3-Dichloropropene, trans-1,3-Dichloropropene, Ethylbenzene, Hexachlorobutadiene, Isopropylbenzene, p-Isopropyltoluene, Methylene chloride, n-Propylbenzene, Styrene, 1,1,1,2-Tetrachloroethane, 1,1,2,2-Tetrachloroethane, Tetrachloroethylene, Toluene, 1,2,3-Trichlorobenzene, 1,2,4-Trichlorobenzene, 1,1,1,1-Trichloroethane, 1,1,2-Trichloroethane, Trichloroethene, Trichlorofluoromethane, 1,2,3-Trichloropropane, 1,2,4-Trimethylbenzene, 1,3,5-Trimethylbenzene, m-Xylene, o-Xylene, p-Xylene
Specified Organic Chemicals not detected:
Alachlor, Aldicarb (Temik), Aldicarb sulfone, Aldicarb sulfoxide, Aldrin, Atrazine, Benzo(a)pyrene, Butachlor, Carbaryl, Carbofuran (Furadan), Chlordane, 2,4-D, 1,2-Dibromo-3-chloropropane, Dicamba, Dieldrin, Di(2-ethylhexyl)adipate, Di(2-ethylhexyl)phthalate, Dinoseb, Diquat, Endothal, Endrin, Ethylene dibromide (EDB), Glyphosate, Heptachlor, Heptachlor epoxide, Hexachlorobenzene, Hexachlorocyclopentadiene, 3-Hydroxycarbofuran, Lindane, Methomyl, Methoxychlor, Methyl-tertiary-butyl-ether (MTBE), Metolachlor, Metribuzin, Oxamyl (Vydate), Pentachlorophenol, Picloram, Polychlorinated biphenyls [PCBs], Propachlor, Simazine, Toxaphene, 2,4,5-TP (Silvex), 2,3,7,8-TCDD (Dioxin), Vinyl chloride
Unspecified Organic Chemicals not detected:
Acenaphthene, Acenaphthylene, Acetochlor, Acetone, Acifluorfen, Ametryn, Anthracene, Bentazon, Benzo[a]anthracene, Benzo[b]fluoranthene, Benzo[k]fluoranthene, Benzo[g,h,i]perylene, a-BHC, b-BHC, d-BHC, Bromacil, Butylate, Butylbenzylphthalate, a-Chlordane, g-Chlordane, Chlorobenzilate, 2-Chlorobiphenyl, Chloroneb, Chlorothalonil (Draconil, Bravo), Chlorpropham, Chlorpyrifos (Dursban), Chrysene, Cycloate, 2,4-DB, DCPA(Dacthal), DCPA (total mono & diacid degradate), p,p'DDD, p,p'DDE, p,p'DDT, Diazinon, Dibenz[a,h]anthracene, Di-n-Butylphthalate, 3,5-Dichlorobenzoic acid, 2,3-Dichlorobiphenyl, Dichlorprop, Dichlorvos (DDVP), Diethylphthalate, Dimethoate, Dimethylphthalate, 2,4-Dinitrotoluene, 2,6-Dinitrotoluene, Di-N-octylphthalate, Diphenamid, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin aldehyde, EPTC, Ethoprop, Etridiazole, Fluoranthene, Fluorene, 2,2',3,3',4,4',6-Heptachlorobiphenyl, Heptachlor epoxide (isomer B), 2,2',4,4',5,6'-Hexachlorobiphenyl, Indeno[1,2,3-cd] pyrene, Isophorone, Malathion, Methiocarb, Methyl Paraoxon, Mevinphos, MGK264-isomer a, MGK264-isomer b, Molinate, Naphthalene, Napropamide, cis-Nonachlor, trans-Nonachlor, 2,2',3,3',4,5',6,6'-Octachlorobiphenyl, Paraquat, Parathion, Pebulate, Pendimethalin, 2,2',3',4,6-Pentachlorobiphenyl, Permethrin, trans-Permethrin, Phenanthrene, Prometryn, Pronamide, Propazine, Propoxur (Baygon), Pyrene, 2,4,5-T, Terbacil, Terbutylazine, Terbutryn, 2,2',4,4'-Tetrachlorobiphenyl, Thiobencarb, 2,4,5-Trichlorobiphenyl, Trifluralin, Venolote
UNREGULATED CONTAMINANTS MONITORING RULE (UCMR) CHEMICALS NOT DETECTED
Acetochlor ethane sulfonic acid (ESA), Acetochlor oxanilic acid (OA), Alachlor ESA, Alachlor OA, 1,3-dinitrobenzene, 2,2',4,4',5,5'-hexabromobiphenyl (HBB), 2,2',4,4',5,5'-hexabromodiphenyl ether (BDE-153), Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX), Metolachlor ESA, Metolachlor OA, N-nitroso-diethylamine (NDEA), N-nitroso-dimethylamine (NDMA), N-nitroso-di-n-butylamine (NDBA), N-nitroso-di-n-propylamine (NDPA), N-nitroso-methylethylamine (NMEA), N-nitroso-pyrrolidine (NPYR), 2,2',4,4',5-pentabromodiphenyl ether (BDE-99), 2,2',4,4',6-pentabromodiphenyl ether (BDE-100), Terbufos sulfone, 2,2',4,4'-tetrabromodiphenyl ether (BDE-47), 2,4,6-trinitrotoluene (TNT).

Footnotes

- (1) USEPA Secondary MCL: NYSDOH has not set an MCL for this parameter.
- (2) Value represents MRDL, which is a level of disinfectant added for water treatment that may not be exceeded at the consumer's tap without an unacceptable possibility of adverse health effects. The MRDL is enforceable in the same manner as an MCL and is the calculated running annual average. Data presented are the range of individual sampling results and the highest of the four quarterly running annual averages.
- (3) Determination of MCL violation: If a sample exceeds the MCL, a second sample must be collected from the same location within two weeks. If the average of the two results exceeds the MCL, then an MCL violation has occurred.
- (4) Action Level (not an MCL) measured at-the-tap. The data presented in this table were collected from sampling stations at the street curb. For at-the-tap monitoring, see the **Lead and Copper Rule Sampling at Residential Water Taps** table.
- (5) A Langelier Index of less than zero indicates corrosive tendencies.
- (6) Hardness of up to 3 grains per gallon is considered soft water; between 3 and 9 is moderately hard water.
- (7) If iron and manganese are present, the total concentration of both should not exceed 500 µg/L.
- (8) Only one sample collected on 09/01/09 from a substitute location for site 39650 (Turtle Bay, 10017) had a value of 22 µg/L above the Action Level of 15 µg/L.
- (9) One sample collected on 7/10/09 from site 45250 (Arverne, 11692) had a pH of 9.2 which is outside the optimal range. The reported average value for pH is the median value.
- (10) Water containing more than 20 mg/L of sodium should not be used for drinking by people on severely restricted sodium diets. Water containing more than 270 mg/L of sodium should not be used for drinking by people on moderately restricted sodium diets.
- (11) Turbidity is a measure of cloudiness of the water. Turbidity is monitored because it is a good indicator of water quality and can hinder the effectiveness of disinfection.
- (12) This MCL for turbidity is the monthly average rounded off to the nearest whole number. Data presented are the range of individual sampling results and the highest monthly average from distribution sites.
- (13) This MCL for turbidity is on individual readings taken every four hours at the source water entry point. Value presented is the highest individual sampling result.
- (14) Although Croton water and Groundwater were not put into distribution in 2009, DBP monitoring is conducted at specified locations based on the potential distribution of the different source waters to consumers. As such, each source has a defined set of monitoring sites and the data are reported by service area.
- (15) USEPA MCLs for HAA5 and TTHMs are the calculated quarterly running annual average. Data presented are the range of individual sampling results and the highest quarterly running annual average.
- (16) If a sample and its repeat sample are both positive for coliform bacteria and one of the two samples is positive for *E. coli*, then an MCL violation has occurred.

Definitions

Action Level (AL):

The concentration of a contaminant, which if exceeded, triggers treatment or other requirements that a water system must follow. An exceedence occurs if more than 10% of the samples exceed the Action Level.

Maximum Contaminant Level Goal (MCLG):

The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety.

Maximum Contaminant Level (MCL):

The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as feasible, using the best available treatment technology.

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.

Maximum Residual Disinfectant Level Goal (MRDLG):

The level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contamination.

Treatment Technique (TT):

A required process intended to reduce the level of a contaminant in drinking water.

90th Percentile Value:

The values reported for lead and copper represent the 90th percentile. A percentile is a value on a scale of 100 that indicates the percent of a distribution that is equal to or below the value. The 90th percentile is equal to or greater than 90% of the lead and copper values detected at your water system.

Abbreviations

CFU/mL = colony forming units per milliliter

mg/L = milligrams per liter (10⁻³ grams per liter)

MPN/100mL = most probable number per 100 milliliter

NA = Not Applicable

ND = Lab analysis indicates parameter is not present

NDL = No Designated Limit

NTU = Nephelometric Turbidity Units

µS/cm = microsiemens per centimeter

µg/L = micrograms per liter (10⁻⁶ grams per liter)

µmho/cm = micromhos per centimeter

pCi/L = picocuries per liter



Frequently Asked Questions

At times, my drinking water looks “milky” when first taken from a faucet, but then clears up. Why?

Air becomes trapped in the water as it makes its long trip from the upstate reservoirs to the City. As a result, bubbles of air can sometimes cause water to appear cloudy or milky. This condition is not a public health concern. The cloudiness is temporary and clears quickly after water is drawn from the tap and the excess air is released.

At times I can detect chlorine odors in tap water. What can I do about it?

Chlorine odors may be more noticeable when the weather is warmer. Chlorine is a disinfectant and is added to the water to kill germs. The following are ways you can remove the chlorine and its odor from your drinking water:

- Fill a pitcher and let it stand in the refrigerator overnight. (This is the most effective way to address a chlorine odor in drinking water.)
- Fill a glass or jar with water and let it stand in sunlight for 30 minutes.
- Pour water from one container to another about 10 times.
- Heat the water to about 100 degrees Fahrenheit.
- Once you remove the chlorine, be sure to refrigerate the water to limit bacterial regrowth.

Is New York City’s water “hard”?

Hardness is a measure of dissolved calcium and magnesium in drinking water. The less calcium and magnesium in the water (“soft” water), the easier it is to create lather and suds. Depending upon location, the hardness can be 1.0 grain/gallon (CaCO₃) for the

Catskill/Delaware System and 5 grains/gallon for the Croton System. New York City’s water is predominantly “soft.”

Sometimes my water is a rusty brown color. What causes this?

Brown water is commonly associated with plumbing corrosion problems inside buildings and from rusting hot water heaters. If you have an ongoing problem with brown water, it is probably due to rusty pipes. It is recommended that you run your water until cold for (2 - 3 minutes), if it has not been used for an extended period of time. This will flush the line. You can avoid wasting water by catching your “flush” water in a container and using it to water plants or for other purposes. Brown water can also result from street construction or water main work being done in your area. Any disturbance to the main, including the opening of a fire hydrant, can cause pipe sediment to shift, resulting in brown water. The settling time will vary, depending on the size of the water main.

Should I buy bottled water?

You do not need to buy bottled water for health reasons in New York City, since our water meets or exceeds all federal and state health-based drinking water standards. Also, bottled water costs up to 1,000 times more per year than the City’s drinking water. When purchasing bottled water, consumers should look for the New York State Health Department (NYSHD) CERT #. Consumers can access additional information on New York State certified bottled water facilities within the entire United States that can be sold within New York State at www.health.state.ny.us/environmental/water/drinking/bulk_bottle/bottled.htm. As an alternative to purchasing bottled water, use a reusable bottle and fill it with New York City tap water.



Environmental Protection

59-17 Junction Boulevard
Flushing, New York 11373-5108

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Please share this information with other people who drink New York City tap water, especially those who may not have received this publication directly such as people who live in apartments or nursing homes, attend schools, or have businesses. You can do this by posting this publication in a public place or distributing copies by hand or mail.

Contact Us

For a copy of this report, to report unusual water characteristics, or to request a free kit to test for lead in your drinking water, visit www.nyc.gov/dep or call 311, or from outside NYC, call (212) New-York. TTY services are available by calling (212) 504-4115.

For more information on *Cryptosporidium* and *Giardia*, please contact the Bureau of Communicable Diseases of the New York City Department of Health and Mental Hygiene at (212) 788-9830 or call 311.

To contact the New York City Department of Health and Mental Hygiene about other water supply health-related questions, call 311, or call New York State Department of Health, Bureau of Water Supply Protection at (518) 402-7650.

To report any pollution, crime or terrorism activity occurring both in-City and in the watershed, call (888) H2O-SHED (426-7433).

To view this 2009 Statement, announcements of public hearings, or other information, visit DEP's website at: www.nyc.gov/dep

Este reporte contiene información muy importante sobre el agua que usted toma. Haga que se la traduzcan o hable con alguien que la entienda.

Ce rapport contient des informations importantes sur votre eau potable. Traduisez-le ou parlez en avec quelqu'un qui le comprend bien.

Questo documento contiene informazioni importanti sulla vostra acqua potabile. Traducete il documento, or parlatene con qualcuno che lo può comprendere.

Rapò sa a gen enfòmasyon ki enpòtan anpil sou dlo w'ap bwè a. Fè tradwi-l pou ou, oswa pale ak yon moun ki konprann sa ki ekri ladan-l.

Ten raport zawiera bardzo istotną informację o twojej wodzie pitnej. Przetłumacz go albo porozmawiaj z kimś kto go rozumie.

В этом материале содержится важная информация относительно вашей питьевой воды. Переведите его или поговорите с кем-нибудь из тех, кто понимает его содержание.

這個報告中包含有關你的飲用水的重要信息。請將此報告翻譯成你的語言，或者詢問懂得這份報告的人。

이 보고서는 귀하의 식수에 관한 매우 중요한 정보를 포함하고 있습니다. 이 정보에 대해 이해하는 사람에게 그 정보를 번역하거나 통역해 받으십시오.