2017 Water Quality Report

City of Manhattan Kansas

How often is your water tested?

The City of Manhattan tests water throughout the treatment process, when it reaches the water towers and at various locations throughout the distribution system.

In addition to manual testing, we also use automated analyzers that continuously test the water before, during and after the treatment process for pH, conductivity, turbidity, free chlorine, total chlorine and other water quality parameters.

Finished water that has been through the water treatment process is regularly tested. Water samples are collected weekly by the environmental staff from the City's six storage tanks and tested for pH, chlorine, ammonia and other parameters.

The following tests are conducted by certified Water Treatment Plant operators:

- Every 4 hours: Hardness, pH, total chlorine, and turbidity
- Every 8 hours: Total dissolved solids
- Every 24 hours: Fluoride and free ammonia

We also collect the following samples and submit them to the KDHE laboratory in Topeka:

- Monthly: Coliform bacteria (60 samples from the distribution system)
- Quarterly: Fluoride
- Annually: Trihalomethanes/haloacetic acids, nitrate, synthetic organic compounds and volatile organic compounds
- Tri-Annually: Lead, copper, regulated and unregulated inorganic contaminants

Our commitment to our customers

Year after year, we deliver on a promise to provide safe and reliable drinking water. This promise demands foresight, investment and long-range planning. Monitoring and treatment are key methods by which we protect the public water supply.

The source of the City's drinking water is 20 public water supply wells located near the confluence of the Big Blue and Kansas rivers. Protecting the wellfield is a vital public service that remains a top priority.

In 1999, we initiated a voluntary wellfield water quality monitoring program, testing the untreated water directly from the 20 public water supply wells.

Find more information at CityofMHK.com/Water.

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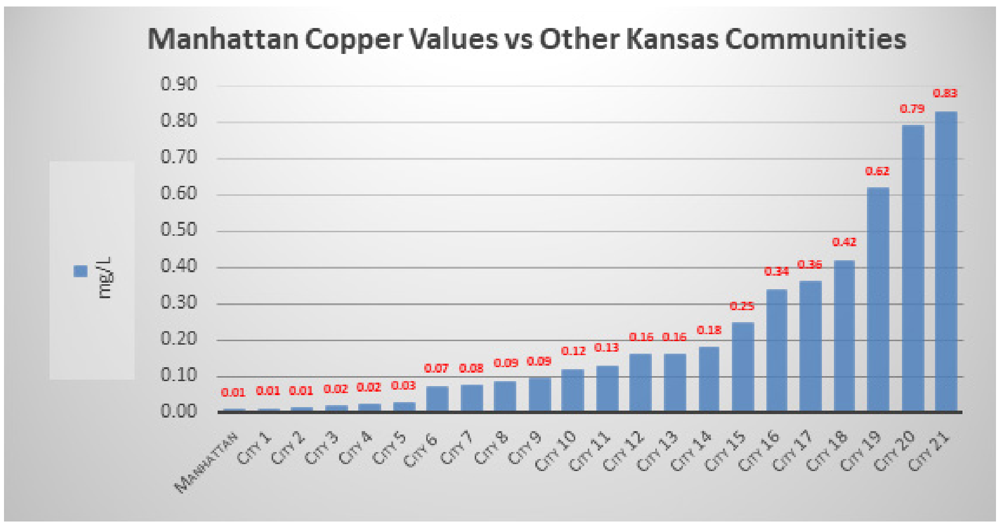
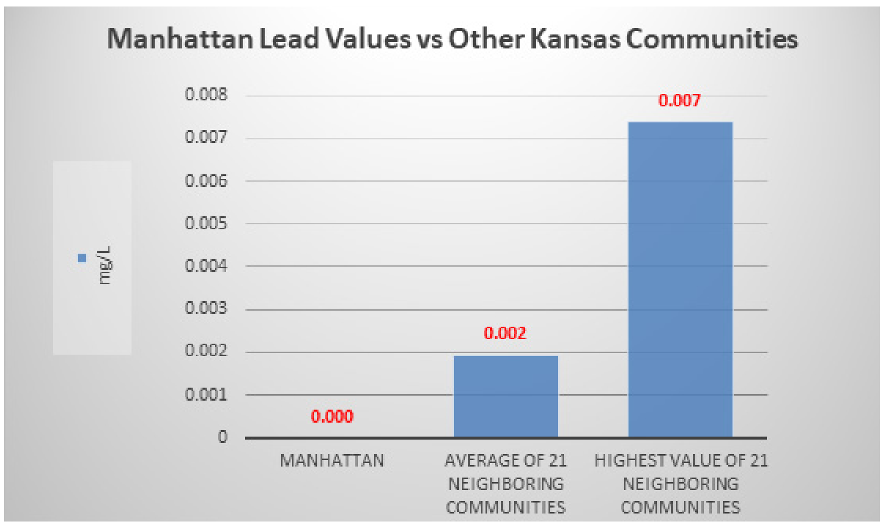
Manhattan is a regional leader in the prevention of lead contamination

Lead and Copper





The City of Manhattan would like you to know that years prior to lead contamination making headlines, we were working hard to ensure that our drinking water was safe, and taking steps to guard our community against the dangers of lead in drinking water.

In fact, because of historically low lead and copper levels, in 1994, KDHE recommended the City of Manhattan be put on a reduced monitoring schedule from annual to triannual monitoring.

In 2017, with the help of local home owners, 30 samples were collected for lead and copper analysis. We compared the results of this analysis with 21 similar communities in Kansas and found our levels to be the lowest of all those surveyed. Just one more reason we're all lucky to call Manhattan home!

Note: The values in the graphs above represent the 90th percentile

How does the City prevent lead contamination?

- pH of water leaving WTP is monitored closely and leaves the plant at around 9.20 (about as corrosive as hand soap)
- Sodium hexametaphosphate, which can help inhibit corrosion by creating a coating on the inside of pipes, is added during the treatment process

How does lead contamination occur?

Lead is not found in our source water and it's not introduced during the treatment process.

Lead contamination occurs when corrosive water sits in lead pipes, pipes with lead solder or old plumbing fixtures made of brass, allowing the lead to dissolve into the water.

How is lead measured?

Lead and copper is reported by the 90th percentile. In a ranking of 10 samples, the ninth highest sample is the value representing the 90th percentile.

The 90th percentile for lead in Manhattan's drinking water is 0.00 parts per million (ppm). The average of the 21 other Kansas communities surveyed was 0.002 ppm. For copper, Manhattan's 90th percentile is 0.01 ppm compared with an average of 0.23 ppm in the other communities.

There were no violations of drinking water standards in 2017

Water Quality Data

This report is based upon tests conducted by the Kansas Department of Health and Environment (KDHE) on the finished water produced by the City of Manhattan's Water Treatment Plant. Unless otherwise noted, the data represent tests conducted between January 1 and December 31, 2017. Of the 87 contaminants regulated by the Environmental Protection Agency (EPA), only fourteen (14) were detected in the compliance monitoring samples. However, two (2) of the detected contaminants (chloramines and fluoride) are added as part of the treatment process to improve water quality. All detected contaminants were below the Maximum Contaminant Level (MCL).

The following tables list the name of each substance, unit, MCLs, the amount detected and Maximum Contaminant Level Goal (MCLG). All regulated and some unregulated contaminants that were detected in the water collected, even in the most minute traces, are included. The footnotes explain the findings, and there is also a key to the units of measurement. MCL is defined as "the highest level of a contaminant that is allowed in drinking water." MCLG is "the level of a contaminant in drinking water below which there is no known or expected risk to health." MCLs are set as close to the MCLGs as feasible. MCLGs allow for a margin of safety.

Detected Regulated Contaminants

PARAMETER	AVERAGE LEVEL DETECTED	RANGE	MCL	MCLG	VIOLATION	SAMPLE DATE	LIKELY SOURCE
Arsenic (ppb)	2.30	2.30	10	0	No	May 16, 2017	Erosion of natural deposits; runoff from orchards; runoff from glass and electronics production waste
Atrazine (ppb)	0.31	0.31	3	3	No	June 13, 2017	Runoff from herbicide used on row crops
Barium (ppm)	0.037	0.037	2	2	No	May 16, 2017	Erosion of natural deposits; discharge from metal refineries; discharge of drilling wastes
Chloramines[1] (ppm)	2.55	1.12-3.73	4	4	No	January - December 2017	Water additive used to control microbes
Chromium (ppb)	2.20	2.20	100	100	No	May 16, 2017	Erosion of natural deposits; discharge from steel and pulp mills
Fluoride[2] (ppm)	0.62	0.51 - 0.83	4	4	No	January - December 2017	Water additive that promotes strong teeth
Nitrate (ppm)	0.23	0.23	10	10	No	May 2, 2017	Runoff from fertilizer use
Selenium (ppb)	2.0	2.0	50	50	No	May 16, 2017	Erosion of natural deposits

Microbiological

BY-PRODUCT	RESULT	MCL	MCLG	TYPICAL SOURCE
Coliform (TCR)	In November 2017, 1.5% of samples tested positive	No more than 5% of samples can test positive	0	Naturally present in the environment

In compliance with the Total Coliform Rule (TCR), the City of Manhattan is required to collect a minimum of 60 samples per month (720 per year) for bacteriological water monitoring. Coliform bacteria are usually harmless but their presence in water can be an indication of disease-causing bacteria. When Coliform bacteria are found, special follow-up tests are done to determine if harmful bacteria are present in the water supply. Any violation of drinking water microbiological standards requires issuing a public notice. In November 2017, Coliform bacteria were found in one sample. However, no bacteria were found in any follow-up tests. There was no violation, and no public notice was required.

Disinfection By-Products

BY-PRODUCT	HIGHEST RAA	RANGE	MCL	MCLG	VIOLATION	SAMPLE DATE	LIKELY SOURCE
Haloacetic Acids (HAA5s) (ppb)	13.0	10.0-13.0	60	N/A	No	August 29, 2017	By-product of drinking water disinfection
Total Trihalomethanes (TTHMs) (ppb)	21.0	19.0-21.0	80	N/A	No	August 29, 2017	By-product of drinking water disinfection

Metals in Drinking Water from Home Taps

The City of Manhattan is required to monitor for lead and copper every three years. With the cooperation of local homeowners, City staff collected samples in the summer of 2017. 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. The City of Manhattan 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. Information on lead in drinking water, testing methods and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline or at http:/www.epa.gov/safewater/lead.

ANALYTE	90TH PERCENTILE [3]	RANGE	MCL	MCLG	VIOLATION	SAMPLE DATE	LIKELY SOURCE
Copper (ppm)	0.01	0.00 - 0.084	AL = 1.3	AL = 1.3	No	July - September 2017	Corrosion of household plumbing systems; corrosion of natural deposits; leaching of wood preservatives
Lead (ppb)	0.0	0.0 - 9.6	AL = 15	AL = 15	No	July - September 2017	Corrosion of household plumbing systems; erosion of natural deposits

Radiological Contaminants

PARAMATER	UNIT	HIGHEST LEVEL DETECTED	RANGE	MCL	MCLG	VIOLATION	SAMPLE DATE	LIKELY SOURCE
Combined Radium (-226 & -228)	pCi/L	0.8	0.8	5	0	No	July 11, 2017	Erosion of natural deposits

Detected Unregulated Contaminants

Unregulated contaminants are tested every three years. These samples were collected on May 16, 2017.

PARAMETER	LEVEL DETECTED	SMCL
Alkalinity as CaCO3 (ppm)	45.0	300
Calcium (ppm)	14	200
Chloride (ppm)	49	250
Conductivity, Specific (μmhos/cm)	420	1500
Corrosivity (LANG)	-0.34	0
Hardness, Total[4] (ppm)	83	400
Magnesium (ppm)	12	150
Manganese (ppm)	0.0013	0.05
pH (pH units)	8.5	8.5
Phosphorous, Total (ppm)	0.11	5
Potassium (ppm)	7.5	100
Silica (ppm)	18	50
Sodium (ppm)	41	100
Solids, Total Dissolved (ppm)	230	500
Sulfate (ppm)	63	250

Key to Tables

AL=Action Level: Any samples that contain over this amount of a contaminant require corrosion control action by the utilities

LANG=Langelier's Index: Used to reflect corrosion or deposition of scale deposits

N/A=Not Available

pCi/L = picocuries per liter (a measure of radioactivity in water)

ppb=parts per billion or micrograms per liter (μg/L): One part per billion equals one penny per $10,000,000

ppm=parts per million or milligrams per liter (mg/L): One part per million equals one penny per $10,000

SMCL=Secondary Maximum Contaminant Level

μmhos/cm=micromhos per centimeter

Message from the Environmental Protection Agency

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 (800-426-4791). The sources of drinking water (both tap 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 activity.

Contaminants that may be present in source water before treatment include microbial contaminants, such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations and wildlife; and inorganic contaminants, such as salts and metals. Inorganic contaminants may be naturally occurring or result from urban stormwater runoff, industrial or domestic wastewater discharges; oil and gas production; mining or farming. Pesticides and herbicides, which may come from a variety of sources such as agriculture, urban stormwater runoff and residential uses, can be found in source water. It is also possible to find radioactive contaminants in source water, which can be naturally occurring or be the result of oil and gas production and mining activities. Organic chemical contaminants, including synthetic and volatile organic chemicals, which are by-products of industrial processes and petroleum production, and can also come from gas stations, urban stormwater runoff and septic systems, may be present in source water.

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, persons 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/Center for Disease Control 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).

In order to ensure that tap water is safe to drink, the EPA prescribes regulations that limit the amount of certain contaminants in water provided by public water systems. We treat our water according to EPA regulations. Food and Drug Administration regulations establish limits for contaminants in bottled water, which must provide the same protection for public health.

[1] Compliance is based on a Running Annual Average (RAA) of the most recent 12 months of testing. The RAA was 2.55 ppm for 2017. Since chloramines are added disinfectants, MCLs do not apply. The highest level allowed in drinking water is the Maximum Residual Disinfectant Level (MRDL). For chloramines, the highest level allowed is 4 ppm.

[2] Fluoride occurs naturally in very low concentrations. It is added at the Water Treatment Plant to promote dental health.

[3] In a ranking of 10 samples, the ninth highest sample is the value that represents the 90th percentile.

[4] Hardness can also be expressed in grains per gallon. To convert ppm to grains per gallon, divide by 17.1, (110 ppm=6.43 grains per gallon).