MWA Consumer Confidence Report 2023

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This is an abridged edition of an annual report on the tap water quality of Metropolitan Waterworks Authority (MWA). The objective is to provide information on tap water quality in Bangkok, Nonthaburi and Samut Prakan service areas.

MWA's raw water sources: Raw water sources of MWA come from Chao Phraya river and Maeklong Dam.

• Chao Phraya River: used as a raw water source of Bankhen, Samsen, and Thonburi Water Treatment Plants (WTP). The water flows to the East raw water Canal and then is delivered to raw water intake at Samlae Pumping Station, Pathum Thani Province.

 Maeklong Dam: used as a raw water source of Mahasawat WTP. The water flows to the West raw water Canal and then is delivered to raw water intake at Tha Muang Pumping Station located above Maeklong Dam, Kanchanaburi Province.

Water treatment: These are MWA's key process:

1. Raw water quality improving: Raw water flowing through the canal will naturally increase in quality due to the exposure to air, and sunlight, as well as gravitational precipitation. The bar screens are also installed at treatment plan's raw water pumping unit to remove suspended materials.

2. Chemical dosing: Chemical doses are added before the water enters a sedimentation tank. Pre-lime is used for control the pH in order to improve precipitation efficiency. Pre-chlorination will be used to reduce color, odor, and algae.

3. Precipitation: At this stage, the appropriate amount of alum is supplied based on the raw water quality in each season. In the Clarifiers, water will be sherd with chemicals and react with the suspended particles. Then, the suspended particles will coagulate together and sink to the bottom of the tank. The clear water continues to the filtration tank.

4. Filtration: Clear water from prior process flow to filtration process. As filter materials, MWA uses anthracite powder and sand. The turbidity of the water from the filter tank is less than 1.0 NTU

5. Disinfection: Chlorine is added at this step to ensure that almost microorganisms are killed or inactivated as well as the removal of organic matter, odor, color, and iron. In addition, tap water contains Free Residual Chlorine, which eliminates bacteria that could later cause contamination.

6. Distribution: The tap water is pumped to the water transmission station and water distribution station via water tunnels and trunk mains. The water is then pushed into the supply pipes to service the public.

Tap water monitoring: MWA has scientists for always water quality monitoring in every steps of water treatment processes. We collect water samples more than 3,000 samples per year as followed World Health Organization (WHO) Guidelines for Drinking- water Quality from the water transmission system covered the service area. The water quality of physical, chemical, and biological parameters is analyzed by certified ISO/IEC 17025 laboratory. The quality testing results show that all samples collected annually in 2023 complied with MWA specifications for tap water quality and common international standards.

Additionally, MWA has online water quality monitoring system stations, which are installed coverage in the MWA service area. Everyone can access real-time information around the clock on the website twqonline.mwa.co.th or the Application MWA onMobile.





Tap water quality 2023

Biological Aspect	Satisfy criteria	Average Value	Units	MWA's specification	Likely sources of contamination
Biological Aspect					
E. coli	✓	Absence	Presence-Absence per 100 mL	Absence	Pipe leakage or lack of proper filter maintenance Sewage, agricultural, or industrial communities
Pathogenic Bacteria*	✓	Absence	Presence-Absence per 100 mL	Absence	Pipe leakage or lack of proper filter maintenance Sewage, agricultural, or industrial communities
<i>Legionella</i> spp.	✓	Absence	Presence-Absence per 100 mL	Absence	Lack of proper building's water supply system maintenance
Physical – Chemical Aspect					
Residual Chlorine	√	0.70	mg/L	0.2 – 2.0	Chlorine disinfection
Turbidity	✓	0.34	NTU	≤ 1.0	Pipe leakage or Lack of proper buildings water supply system maintenance
рН	~	7.37	-	6.5 - 8.5	Naturally occurring element, Sewage, agricultural, or industrial communities
Conductivity	-	341	µs/cm	≤ 300	Naturally occurring element, sea water intrusion Sewage, agricultural, or industrial communities
Total dissolved solids	\checkmark	209	mg/L	≤ 1,000	Naturally occurring element, sea water intrusion Sewage, agricultural, or industrial communities
Total hardness	\checkmark	109	mg/L	-	Naturally present in the environment
Chloride	✓	27	mg/L	≤ 250	Naturally present in the environment Sewage or sea water intrusion
Sodium	\checkmark	21	mg/L	≤ 200	Naturally present in the environment Sewage or sea water intrusion
Fluoride	\checkmark	0.28	mg/L	≤ 0.7	Naturally present in the environment
Iron	\checkmark	0.08	mg/L	≤ 0.3	Corrosion of household plumbing, Naturally present in the environment
Manganese	\checkmark	0.008	mg/L	≤ 0.08	Naturally present in the environment
Aluminum	\checkmark	0.1	mg/L	≤ 0.2	Naturally present in the environment
Zinc	\checkmark	0.0013	mg/L	≤ 3	Corrosion of household plumbing, Naturally present in the environment
Arsenic	\checkmark	0.0016	mg/L	≤ 0.01	Sewage, agricultural, or industrial communities
Lead	✓	0.002	mg/L	≤ 0.01	Sewage, agricultural, or industrial communities
Chromium	✓	0.0016	mg/L	≤ 0.05	Sewage, agricultural, or industrial communities
Cadmium	✓	<0.0002	mg/L	≤ 0.003	Sewage, agricultural, or industrial communities
Copper	~	< 0.05	mg/L	≤1	Corrosion of household plumbing, Sewage, agricultural, or industrial communities
Mercury	\checkmark	<0.00001	mg/L	≤ 0.006	Sewage, agricultural, or industrial communities
THMs	✓	0.21	Sum of ratio	≤1	Chlorine disinfection by-product

Note * Vibrio cholerae, Salmonella sp., Shigella sp., Staphylococcus aureus, Clostridium perfringens

Regularly analyzed parameters have complied with MWA's specification

Virus: Poliovirus, Rotavirus, Hepatitis A Virus, Norovirus

Radioactive: Gross alpha activity, Gross beta activity

Pesticides: Atrazine, Carbofuran, Chlorpyrifos, DDT, Glyphosate and Paraquat

Volatile organic compounds (VOCs) Benzene derivatives group: Benzene, Toluene, m-Xylene, Styrene,

Isopropylbenzene, n-propylbenzene, 1,3,5-trimethylbenzene, and Tertiary Butyl Benzene



Good to know about water quality.

Can MWA tap water be drinkable??

Ans MWA produces tap water that complies with MWA specifications of tap water quality, which do be referenced from WHO Guidelines for Drinking-water Quality. Furthermore, we apply water safety plans for water treatment process since upstream to downstream and always test water quality, which confirms that MWA tap water is safe to drink. When you open the faucet, you get clear water and a chlorine smell, which indicates that the tap water is clean and safe to drink.

Nonetheless, the plumbing system for a home or building's water supply has an impact on the quality of the tap water; neglecting this system can result in a decline in tap water quality. The results of a water testing study conducted ten years ago on approximately 10,000 samples from water storages revealed that 6.43 percent of the samples contained E. Coli bacteria, which is in violation of WHO guidelines.

Therefore, People should always maintain their plumbing, water storage, and water equipment. For example, a water storage facility should have its tanks inspected and cleaned once every six months.

• If MWA claim that tap water is clean, what does the dirty of a storage tank and a filter come from?

Ans Although tap water, which the turbidity is lower than 1 NTU, is so clear, the suspension solid is still remain, which has no an effect on health. For the turbidity of water < 1 NTU, the suspension solid is too less to be visible. Moreover, the 1 NTU turbidity followed MWA Guidelines for Tap Water Quality is lower than 5 times of the notice of Department of Health on the Drinking-water Quality Standard and 4 times of WHO Guidelines for Drinking-water Quality. In case of storing water for a long time or use expired filter, the sediment will still collect in the bottom tank or in a filter. Therefore, you should clean your storage tank at least every 6 months and usually change your filter periodically according to handbook stated.

Why should you clean a storage tank constantly?

<u>Ans</u> Constantly clean the storage tank will prevent accumulating sediment. Even the tank is closed but it is not completely seal, so it may contaminate with pathogen from an environment or air. In general, tap water in distribution system has free residual chlorine enough to disinfect the pathogen for prevent post contamination. However, the chlorine in the tank will decompose as a function of time and may not be sufficient for disinfection and the pathogen may grow up in the tank. Therefore, regularly clean the tank at least every 6 months will reduce risk for deterioration of the water quality in the tank.

Why shouldn't water pump be connected to distribution pipes directly?

<u>Ans</u> If there's a leak in the distribution pipes and water pump connect to the distribution pipes directly, water pump will suck the dirt and contaminants from outside into the pipe and mix with tap water. Tap water may become dirty, contaminated with germ and may has foul odors. Dirt, gravel, rocks or sand can damage water pump and tap water related equipment, such as faucets, water purifiers, water heater. In addition, directly connecting the water pump to the distribution pipe also cause trouble to your neighbors who use tap water from the same pipeline. So, people must refrain from connect water pump to distribution pipes directly and install water pump to the water tank instead.

⊕ Is the chlorine in tap water harmful or not?

<u>Ans</u> No, it is not. Chlorine is a disinfectant for tap water production. The presence of free residual chlorine in drinking water indicates that a sufficient amount of chlorine was initially added to the water during treatment to inactivate the bacteria and some viruses. Moreover, the free residual chlorine has to be higher than 0.2 mg/L, which is adequate for protection from recontamination while being stored before delivery or pipes break. Besides, this chlorine level is not harmful to your health

\oplus Does tap water be able to use for cooking rice or food?

Ans Tap water is safe for cooking rice and food. A collaboration of Institute of Food Research and Product Development (IFRPD), Metropolitan Waterworks Authority (MWA), and Provincial Waterworks Authority (PWA) conducted the experiment in the topic "Rice Cooking with Tap Water" to analyze for the emerging of trihalomethanes (THMs) in tap water, water from washing rice, rice cooking water, milled rice, and cooked rice. The results indicated that only a little THMs was be presented in all samples, which is much lower than WHO Guidelines for Drinking-water Quality. Therefore, tap water is safe for consume and does not lead to cause cancer disease from THMs.

Read more in "MWA TAP WATER's FAMILY"



Water Safety Plans (WSPs) MWA applied the principles of the World Health Organization's (WHO) Water Safety Plans (WSPs) in every steps of water production process. WSPs is water quality management plans which take on risk management techniques to ensure the safety of a tap water. It composes of 3 principals

- (1) PROTECTS water sources from contamination
- (2) REMOVES contaminants by water treatment process
- (3) PREVENTS water from re-contaminating in the distribution process to users.

One could even say that WSPs is to supervise water quality from upstream to downstream or the water user's house. It also helps to make the water treatment

process more efficient and can check every step to ensure that public always have safe and clean tap water sufficiently.

How do I clean the water tank correctly?

- 1. Inspect the water tank for damage or leakage, which may cause dirt to enter the tank. If there is, it should be repaired immediately.
- Close the water inlet valve and open the water outlet valve to completely drain the water in the tank.
- 3. Spray water to clean the inside and outside of the tank. Use cleaning equipment to remove sediment that accumulates at the bottom of the tank along with drainage water.
- 4. Mix with 10% water chlorine, using 4 caps of chlorine per 10 liters of water (1 cap = 5 milliliters). Spray the solution on the inside and outside of the tank and leave it for 30 minutes. After that, turn on the water supply in the water tank for normal use.

Interested in cleaning the water tank with MWA. Please contact MWA Call Center 1125 or Services

Supplementary **Business** Management Unit (BU) 0 2500 2802

*Safety equipment should be worn during washing, such as a mask, goggles, and gloves.

Water Quality Analysis Service

MWA conducts testing of tap water, drinking water, ground water & surface water

Accordingto

MWA's specification | WHO's Guidelines | TIS's drinking water | FDA's standard | Surface Water Quality Standards Groundwater quality standards

Our services ensure fast and accurate results with fair prices.

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For Sustainable Development People

Advantageous procedures

has sufficient

clean water.



MWA would be high performance organization that has stability in tap water production and distribution systems.



reduces hygiene risks from waterborne diseases.