

# WATER QUALITY REPORT



# 2021



KUB: 865-524-2911 (Español oprima el numero 2)  
[www.kub.org](http://www.kub.org)

We at KUB are proud that every day we provide the community with high quality, safe drinking water. We have an excellent water quality record and are committed to maintaining it through stringent monitoring and testing.

Our state-of-the-art Water Quality Laboratory performs approximately 100,000 tests each year – many more than the law requires – and checks for more than 150 contaminants to ensure our community's drinking water and waterways are safe.

To ensure your water system is sustainable and maintains its excellent quality, KUB works to renew the more than 1,400 miles of pipe and dozens of pump stations and storage facilities that carry and deliver water to our community. Our Century II system replacement and maintenance program was put in place to address aging infrastructure, an issue that utilities nationwide currently face. KUB replaces 1 percent of our water system each year with pipe that has an average life of 100 years.

We're proud of the fact that we continue to improve our infrastructure while providing water at a great value – less than a penny per gallon.

If you have questions, please call KUB at 865-524-2911.



**Gabriel Bolas, KUB President & CEO**

*Pictured right using KUB's H2O To Go water station*



## Contents

**Water System Overview**

**Drinking Water Sources**

**Protecting Our Source Water**

**Water Quality Summary**

**Protecting Our Drinking Water**

**Keeping the Lead Out**

**Water Safety Regulations**

**Information for Consumers at Risk**

**Contact Information**

# Water System Overview

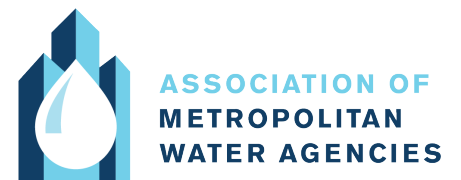


- 1 River Intake
- 2 Treatment Plant
- 3 Finished Water Pump Station
- 4 Transmission Mains
- 5 Storage Facilities  
(A: Elevated Tank B: Ground Reservoir)
- 6 Distribution Mains
- 7 Commercial Service
- 8 Residential Service

## Award-Winning Service

KUB's distribution system was presented an American Water Works Association Award of Excellence for exemplifying best practices in water quality and operational records; maintenance programs and innovation; safety and security; and emergency preparedness.

Additionally, the Association of Metropolitan Water Agencies honored KUB with one of two 2021 Sustainable Water Utility Management Awards, in recognition of its commitment to management that achieves a balance of innovative and successful efforts in areas of economic, social, and environmental endeavors.



# Drinking Water Sources

Sources of drinking water (tap and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. Our source is surface water from the Tennessee River, which supplies the Mark B. Whitaker Water Plant.

As water travels over land or through the ground, it dissolves naturally occurring minerals and, sometimes, radioactive material. It can pick up substances resulting from human activity or the presence of animals.

Contaminants that may be in source water include:

- Microbial contaminants, such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.
- Inorganic contaminants, such as salts and metals, which can occur naturally 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.
- Organic chemical contaminants, including synthetic and volatile organic chemicals, which are byproducts of industrial processes and petroleum production, and can also come from gas stations, urban stormwater runoff, and septic systems.
- Radioactive contaminants, which can be naturally occurring or be the result of oil and gas production and mining activities.

KUB's water source is rated reasonably susceptible to potential contamination. To ensure safe drinking water, all public water systems treat and routinely test their water. An explanation of the SWAP, Source Water Assessment summaries, susceptibility scorings, and the overall TDEC report to EPA can be viewed online at <https://www.tn.gov/environment/program-areas/wr-water-resources/water-quality/source-water-assessment.html>, or you may contact KUB for copies of specific assessments.



# Protect Our Source Water

Each of us could be adding to source water pollution without even knowing it. Even the smallest streams typically lead to the Tennessee River, so although it might seem too far away to matter, most streams (and storm drains) lead to our source. Reducing pollutions at all levels/locations is important! Here are ways you can help protect our source water and the environment.



## RECYCLE

- Unwanted automotive products
- Cleaning products
- Pesticides
- Lawn chemicals

Take waste to:

**HOUSEHOLD HAZARDOUS  
WASTE FACILITY**

1033 Elm Street

*Please note: Latex paint is no longer accepted.*

[www.knoxvilletn.gov](http://www.knoxvilletn.gov)



## MEDICATION DISPOSAL

Never flush unused medicine down drains or toilets

Take medication to:

- Collections sites
- Collection events
- Permanent drop box:  
**KNOXVILLE POLICE  
DEPT. SAFETY BUILDING  
800 Howard Baker Jr. Ave**

[www.kub.org/water](http://www.kub.org/water)



## REDUCE PLASTICS

Contribute to the reduction of plastics in our community by:

- Properly recycling
- Participating in local trash pick up efforts
- Discouraging littering



# Water Quality Summary

| INORGANIC MONITORING |                                |        |          |                                                                                                                            |
|----------------------|--------------------------------|--------|----------|----------------------------------------------------------------------------------------------------------------------------|
| Parameter            | Range or Level Detected        | MCLG   | MCL      | Likely Source in Drinking Water                                                                                            |
| Barium               | 23 ppb                         | N/A    | 2000 ppb | Discharge of drilling wastes and metal refineries; erosion of natural deposits                                             |
| Nitrate              | 0.42 ppm                       | 10 ppm | 10 ppm   | Runoff from fertilizer use; leaching from septic tanks; sewage; erosion of natural deposits                                |
| Fluoride             | 0.48 - 0.66 ppm (avg 0.57 ppm) | 4 ppm  | 4 ppm    | Erosion of natural deposits; water additive, which promotes strong teeth; discharge from fertilizer and aluminum factories |
| Sodium               | 9.6 ppm                        | N/A    | N/A      | Used in treatment process                                                                                                  |

| ORGANIC AND DISINFECTION BYPRODUCT MONITORING |                                                                          |                 |                |                                          |
|-----------------------------------------------|--------------------------------------------------------------------------|-----------------|----------------|------------------------------------------|
| Parameter                                     | Range or Level Detected                                                  | MCLG or MRDLG   | MCL or MRDL    | Likely Source in Drinking Water          |
| Total Organic Carbon (Source) <sup>1</sup>    | 1.9 - 5.2 ppm (avg 2.2 ppm)                                              | N/A             | TT             | Naturally present in the environment     |
| Total Organic Carbon (Tap) <sup>1</sup>       | 1.2 - 1.7 ppm (avg 1.4 ppm)                                              | N/A             | TT             | Naturally present in the environment     |
| Total Trihalo-methanes (THM)                  | Maximum LRAA: 48 ppb <sup>2</sup><br>Individual site range: 20 to 60 ppb | N/A             | 80 ppb         | Byproduct of drinking water chlorination |
| Haloacetic Acids (HAA)                        | Maximum LRAA: 37 ppb <sup>2</sup><br>Individual site range: 14 to 56 ppb | N/A             | 60 ppb         | Byproduct of drinking water chlorination |
| Chlorine Dioxide                              | 0.10 - 0.16 ppm (avg 0.10 ppm)                                           | MRDLG = 0.8 ppm | MRDL = 0.8 ppm | Water additive used to control microbes  |
| Chlorine                                      | Maximum Running Annual Average: 1.6 ppm<br>0.5 - 2.4 ppm                 | MRDLG = 4 ppm   | MRDL = 4 ppm   | Water additive used to control microbes  |
| Chlorite                                      | 0.02 - 0.05 ppm (avg 0.02 ppm)                                           | 0.8 ppm         | 1 ppm          | Byproduct of drinking water disinfection |
| 2,4-D                                         | 0.1 ppb                                                                  | 70ppb           | 70ppb          | Runoff from herbicide used on row crops  |

| TURBIDITY MONITORING   |                         |      |     |                                 |
|------------------------|-------------------------|------|-----|---------------------------------|
| Parameter              | Range or Level Detected | MCLG | MCL | Likely Source in Drinking Water |
| Turbidity <sup>3</sup> | 0.01 - 0.11 NTU         | N/A  | TT  | Soil Runoff                     |

| LEAD AND COPPER MONITORING |                       |         |            |                                          |
|----------------------------|-----------------------|---------|------------|------------------------------------------|
| Parameter                  | 90th Percentile Level | MCLG    | MCL        | Likely Source in Drinking Water          |
| Copper                     | 0.210 ppm             | 1.3 ppm | AL=1.3 ppm | Customer plumbing and service connection |
| Lead <sup>4</sup>          | 1.5 ppb               | 0 ppb   | AL=15 ppb  | Customer plumbing and service connection |

| ADDITIONAL MONITORING <sup>5</sup> |                        |
|------------------------------------|------------------------|
| Parameter                          | Average Level Detected |
| Alkalinity                         | 71 ppm                 |
| Aluminum                           | 13 ppb                 |
| Calcium                            | 24 ppm                 |
| Chloride                           | 15 ppm                 |
| Conductivity                       | 221 µmhos/cm           |
| Hardness                           | 86 ppm                 |
| Iron                               | 5 ppb                  |
| Orthophosphate                     | 0.99 ppm               |
| pH                                 | 7.4 Standard Units     |
| Sulfate                            | 12 ppm                 |
| Total Dissolved Solids             | 110 ppm                |
| Zinc                               | 83 ppb                 |

## State-of-the-Art Water Quality Laboratory

KUB is proud to serve our customers with one of the largest water quality labs certified by the State of Tennessee. The lab supports KUB's daily operations and allows us to quickly respond to customer concerns.



## TERMS AND DEFINITIONS

|                                                                                                                                              |                                                                                                                                                                                               |
|----------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Action Level (AL)</b>                                                                                                                     | The concentration of a contaminant which, if exceeded, triggers treatment or other requirements that a water system must follow.                                                              |
| <b>Maximum Contaminant Level (MCL)</b>                                                                                                       | 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.                           |
| <b>Maximum Contaminant Level Goal (MCLG)</b>                                                                                                 | 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.                                                    |
| <b>Maximum Residual Disinfectant Level (MRDL)</b>                                                                                            | The highest level of a disinfectant allowed in drinking water. There is convincing evidence that adding a disinfectant is necessary for the control of microbial contaminants.                |
| <b>Maximum Residual Disinfectant Level Goal (MRDLG)</b>                                                                                      | Below this level of a drinking water disinfectant, there is no known or expected risk to health. MRDLGs do not reflect the benefits of using disinfectants to control microbial contaminants. |
| <b>Nephelometric Turbidity Unit (NTU)</b>                                                                                                    | A measure of the clarity of water. Turbidity in excess of 5 NTU is just noticeable to the average person.                                                                                     |
| <b>Treatment Technique (TT)</b>                                                                                                              | A required process intended to reduce the level of a contaminant in drinking water.                                                                                                           |
| <i>Note: To make the following common scientific measures of substances in water easier to understand, we have related them to examples.</i> |                                                                                                                                                                                               |
| <b>Parts per million (ppm) or milligrams per liter (mg/l)</b>                                                                                | One part per million is equivalent to one minute in two years or a single penny in \$10,000.                                                                                                  |
| <b>Parts per billion (ppb) or micrograms per liter (ug/l)</b>                                                                                | One part per billion corresponds to one minute in 2,000 years or a single penny in \$10,000,000.                                                                                              |

<sup>1</sup> KUB met the Treatment Technique requirement for Total Organic Carbon in 2021.

<sup>2</sup> Compliance is determined by calculating a quarterly Locational Running Annual Averages (LRAAs) at all the required sampling sites. The range includes the highest and lowest results obtained from monitoring sites across our distribution system in 2021.

<sup>3</sup> No Turbidity violations were incurred during 2021. We met the treatment technique for turbidity with 100% of monthly samples below the turbidity limit of 0.3 NTU. Turbidity is a measure of the cloudiness of the water. KUB monitors turbidity because it is a good indicator of the effectiveness of our filtration system.

<sup>4</sup> None of the households out of the 55 sampled contained concentrations that exceeded the lead action level in 2019. Lead: 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. Knoxville Utilities Board 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 two 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 EPA Safe Drinking Water Hotline or at <http://www.epa.gov/safewater/lead>.

<sup>5</sup> KUB's drinking water meets all existing standards for safe water. In addition to the required testing, KUB tests for over 80 additional parameters. Most of the substances tested for were not found in our water. This table includes the results for additional parameters that were detectable.

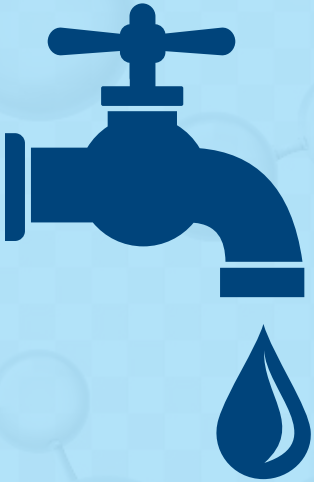
# Protecting Our Drinking Water

State and federal regulations require KUB to operate a Cross-Connection Control Program (CCCP) to protect our community's drinking water from possible contamination. Anything customers attach to plumbing that may introduce contaminants is a potential cross-connection. If water pipes lose pressure, water from homes or businesses with cross-connections may contaminate our drinking water. To prevent that, all customers with potential cross-connections must install, test, and maintain backflow prevention devices. Customers may need a device if they use chemicals or processing equipment, have an alternative water source, or have irrigation systems or fire protection systems. Unprotected cross-connections can introduce public health risks. Therefore, KUB must ensure properties with risks have properly working backflow devices to ensure water quality and compliance. For more information, visit [www.kub.org/cross-connection](http://www.kub.org/cross-connection). If you have questions or think that you may have a cross-connection, please call KUB at 865-524-2911.



**Backflow devices**  
prevent contamination  
of drinking water.

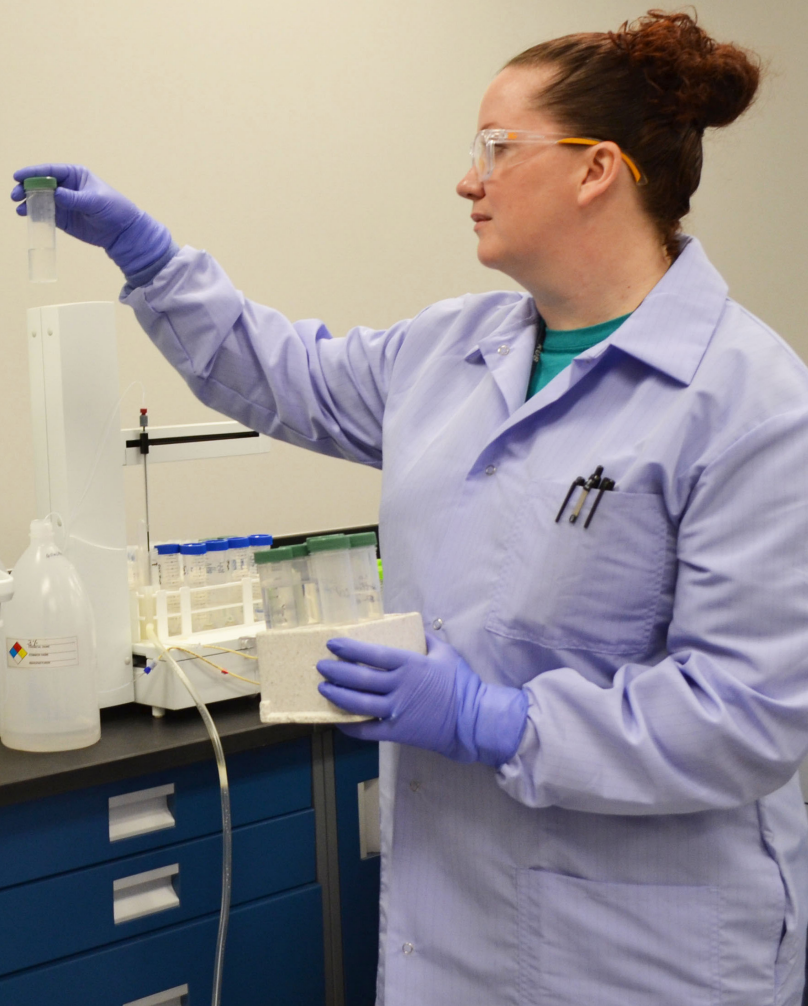
## Keep the Lead Out



Did you know your home's plumbing may affect the quality of water coming from your tap? Concerns about lead in drinking water primarily come from the corrosion, or wearing away, of materials in household plumbing that contain lead. Older homes (pre-1930) are more likely to have plumbing and fixtures containing lead. Even newer homes, however, can have lead solder or fixtures with lead. To control corrosion and reduce the risk of lead from customers' plumbing, KUB continues to use a safe corrosion inhibitor that meets strict standards for use in drinking water. KUB also routinely monitors water quality to ensure effective corrosion control. Those efforts greatly reduce corrosion and ensure that KUB's water will continue to comply with all regulatory standards for lead.



For information on lead in drinking water, testing methods, and steps you can take to minimize exposure, call KUB at **865-524-2911** or EPA's Safe Drinking Water Hotline, **1-800-426-4791**.





# Water Safety Regulations

To ensure tap water is safe to drink, EPA and the Tennessee Department of Environment and Conservation (TDEC) prescribe regulations that limit the amount of certain contaminants in water from public water systems. The U.S. Food and Drug Administration (FDA) establishes regulations and limits for contaminants in bottled water, which must provide the same level of 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.



For more information about contaminants and potential health effects, call EPA's Safe Drinking Water Hotline at 1-800-426-4791.



## Information for Consumers at Risk

Some people may be more vulnerable to contaminants in drinking water than the general population. Immunocompromised people, such as people with cancer undergoing chemotherapy, people 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 guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* and other microbiological contaminants are available from EPA's Safe Drinking Water Hotline, 1-800-426-4791.





## Contact Information

For more information about water contaminants and potential health effects, call the EPA Safe Drinking Water Hotline at 1-800-426-4791. If you have questions about KUB's water or this report, contact KUB at 865-524-2911 or visit our website at [www.kub.org/water](http://www.kub.org/water). KUB's Board meets monthly in open public session. Please feel free to participate in the meetings. Information on regularly scheduled meetings can be obtained on our website or by calling KUB.

**Información en Español:** Esta información es muy importante. Por favor tradúscalo o hable con alguien que lo entienda bien. Para más información en español, llame a KUB al número de teléfono 865-524-2911 y oprima el número 2.

Learn more:  
[www.kub.org/water](http://www.kub.org/water)





**Knoxville Utilities Board**



@KnoxKUB



@knoxvilleutilitiesboard



@KnoxKUB

[www.kub.org](http://www.kub.org)