

2017 ANNUAL DRINKING WATER QUALITY REPORT

MADISON SUBURBAN UTILITY DISTRICT

TEST RESULTS FROM 2016

Madison Suburban Utility District is committed to providing customers with safe and reliable drinking water as we have for over 78 years.

We are pleased to present our Annual Drinking Water Quality Report and annual newsletter. The water treated and distributed by the District meets or exceeds all State and Federal requirements and the EPA's health standards. Our test results are included later in this report.

Share this report with your neighbors and others that may use MSUD water. And remember all public water systems must provide a Water Quality Report each year. Encourage those you know to read the Report issued by their own water provider.
<https://www.epa.gov/ccr>

HOW DO I CONTACT MSUD?

For Billing and Account Information:
615-868-3201, Monday – Friday, 7:30-4:00; or visit www.msud.net

For EMERGENCIES and to report a leak on the street: 24hr/day call 615-865-1636

Questions about this report or Water Quality?
615-865-1636

En Español:
Este informe contiene información muy importante. Tradúcelo ó hable con alguien que lo entienda bien.



The District's Board of Commissioners meets each month at the Business Office, 108 W. Webster St, Madison, TN. These meetings are open to the public. Call for specific dates and times.

The Commissioners of the Madison Suburban Utility District serve four year terms. According to State of Tennessee Utility District Law, vacancies on the Board of Commissioners are filled by appointment by the Davidson County, TN Seventh Circuit Court from a list of three nominees certified by the Board of Commissioners to fill such a vacancy.

Decisions by the Board of Commissioners on customer complaints brought before the Board of Commissioners under the District's customer complaint policy may be reviewed by the Utility Management Review Board of the Tennessee Department of Environment and Conservation pursuant to Section 7-82-702(7) of the Tennessee Code Annotated.

WATER TREATMENT PROCESS

MSUD utilizes some of the most current technology and water chemistry processes to efficiently treat raw river water and transform it into crystal clear, safe drinking water. The MSUD Treatment Plant sends an average of 8 million gallons of water per day into the distribution system, and has a capacity of nearly double that. Water treatment involves two types of processes: (1) physical removal of particulates and contaminants and (2) chemical disinfection. Plant Operators are continuously monitoring the river water and adjusting treatment processes to ensure the finished water is just right. The diagram below outlines how we treat the water you drink.

WHAT IS THE SOURCE OF MY WATER?

Your water comes from the Cumberland River. As a surface water source, it has been rated as highly susceptible to potential contamination based on geologic factors and human activities in the vicinity. A source water assessment has been conducted and is available for review at the Madison Suburban Utility District offices and can be viewed online at

<https://www.tn.gov/environment/article/wr-wq-source-water-assessment>.

CONTAMINANTS IN BOTTLE AND TAP

Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. Community water systems are required to disclose the detection of contaminants; however, bottled water companies are not required to comply with this regulation. 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 Environmental Protection Agency's Safe Drinking Water Hotline (800-426-4791) or visit <http://water.epa.gov/drink/>.

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 activity.

CONTAMINANTS THAT MAY BE PRESENT IN SOURCE WATER INCLUDE:

MICROBIAL CONTAMINANTS, such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operation, and wildlife.

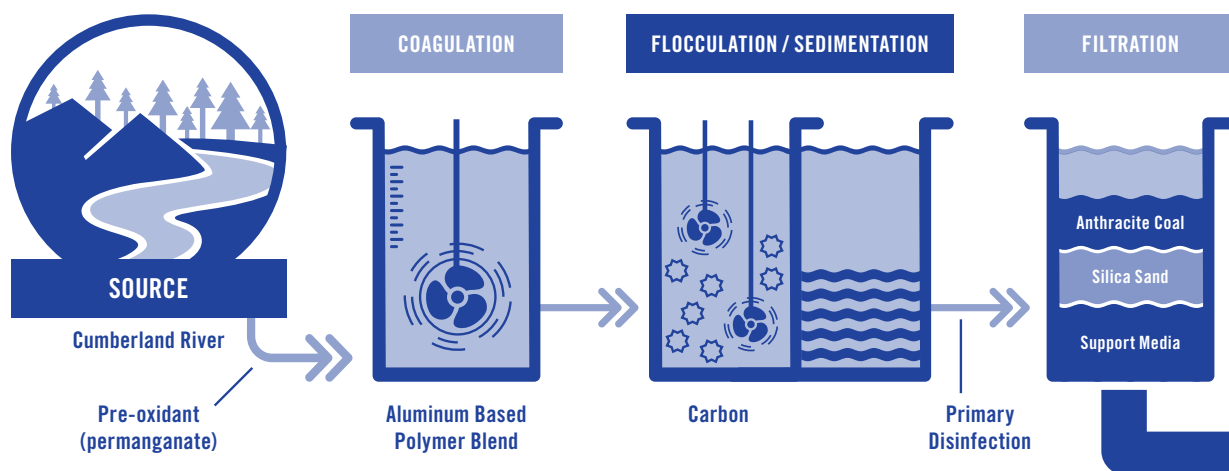
INORGANIC CONTAMINANTS, such as salts and metals, which can be naturally-occurring or result from urban stormwater runoff, industrial or domestic wastewater discharges, oil and gas production, mining or farming.

PESTICIDES AND HERBICIDES, which may come from a variety of sources such as agriculture, 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.

WATER TREATMENT PROCESS



WATER TREATMENT PROCESS

PRE-OXIDANT:

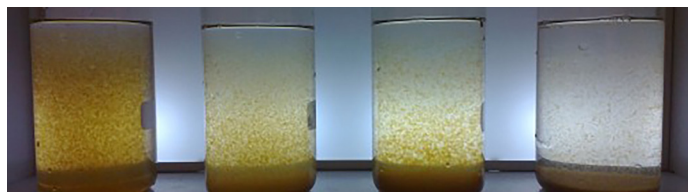
Permanganate is added to immobilize heavy metals and organic chemical compounds. It also offers mild disinfectant properties.

COAGULATION:

This is the chemical process of rapidly mixing “coagulants” with river water. Most particles in source water have negative charges causing them to repel each other, much like the negative ends of two magnets. Coagulation changes the negative charges to neutral. The aluminum based polymer coagulants do an excellent job of neutralizing sediments and organic material.

FLOCCULATION:

Coagulated water is slowly mixed causing the neutral particles (the sediments and suspended organic material) to collide and clump together to form floc. The floc particles continue to clump together forming larger and larger clumps trapping most of the sediment and suspended organic material. The floc now looks like snowflakes suspended in the water. Powdered carbon is added after flocculation and before sedimentation to absorb obnoxious tastes and odors and some organic compounds (like pharmaceuticals and endocrine disruptors). The carbon will settle out in the next process.



SEDIMENTATION:

The floc particles are heavier than water. As the water enters the sedimentation basins the mixing is stopped, allowing the particles to sink to the bottom. The clear water is collected from the top of the basins and sent on to be filtered. This process removes nearly all the chemical material added to the water thus far as well as the bulk of the sediment, organic matter, heavy metals, and microorganisms.

PRIMARY DISINFECTION:

Small amounts of chlorine are added to inactivate viruses, bacteria, and other microorganisms and maintain filter performance. Chlorine also serves as an oxidant to immobilize any metals that may have made it through the previous steps.

FILTRATION:

Water is passed through deep filtration beds to produce water that is crystal clear. Extremely small particles are removed during this process. MSUD produces water with turbidities (cloudiness) significantly better than drinking water standards.

SECONDARY DISINFECTION / FINISHING:

Finished (filtered) water is once again disinfected to destroy harmful bacteria and viruses. An additional amount, known as a chlorine residual, is applied to protect treated water from recontamination as it travels through the distribution system. MSUD also adds a corrosion inhibitor (phosphate) and fluoride to promote healthy teeth and bones.

Secondary Disinfection,
Corrosion Control, Fluoridation



DO I NEED TO TAKE SPECIAL PRECAUTIONS?

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised people such as those undergoing chemotherapy, those 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/CDC guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* and other microbial contaminants are available from the Safe Drinking Water Hotline (1-800-426-4791).

Lead Levels – If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. 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 by visiting epa.gov/lead.

Visit msud.net/leadnews.pdf for specific information about lead in our water.

Cryptosporidium is a microbial parasite found in surface water throughout the US which can cause moderate to severe gastrointestinal distress. We did not detect *Cryptosporidium* in the samples we collected from the river in 2016. Although *Cryptosporidium* can be removed by filtration, the most commonly used filtration methods cannot guarantee 100 percent removal. Most healthy individuals are able to overcome the disease within a few weeks. Immuno-compromised people are encouraged to consult their doctor regarding appropriate precautions to take to prevent infection.

WATER SAFETY 101

Some customers prefer to filter their tap water before drinking. If you decide to do so, be sure to follow the manufacturers' recommendations for maintenance and cleaning. And only use trusted NSF approved filters (this should include the filter in your refrigerator or ice maker). If you filter water to store for later use, it should be refrigerated and not stored longer than 3 days. Improper use of these filtration systems could pose a serious health risk to your family.

Your water can also become contaminated from other points in your home. Cross connections potentially allow contaminated water to enter your family's drinking water. You can protect your family by preventing situations where the back-flow of water can occur. A backflow occurs when the water in your pipes flows the opposite direction it was intended. This can happen either by back-siphonage or back pressure, when a sudden unintended change in water pressure causes the water to flow towards the water main and away from your faucet, or from one part of your home to another.

MONITORING YOUR WATER QUALITY

Every year we monitor the presence of over 100 compounds in your water, before, during, and after treatment. Reported on the next pages are only the compounds we have detected, and are monitored under the Primary Drinking Water Standard established by EPA. For more information on the Safe Drinking Water Act and current standards visit <http://water.epa.gov/lawsregs/rulesregs/sdwa/>.

MSUD employs the most highly trained drinking water professionals in the State. All certified Water Treatment and Distribution Operators complete years of rigorous training, both in the field and in the classroom, must pass the Standardize Tests administered by the State, and must earn continuing education credits to stay current on new regulations, operational best practices, and available resources.

WATER QUALITY IN 2016

REGULATED CONTAMINANTS

MONITORED AT OUR SOURCE

| Contaminant | Date Collected | Level Detected | Unit of Measure | Range | Likely Sources of Contaminants |
|-----------------|----------------|----------------|-----------------|-------|--------------------------------------|
| Cryptosporidium | Oct - Dec 2016 | 0 | oocysts | 0 | Naturally present in the environment |
| Giardia | Oct - Dec 2016 | 2.5 | cysts | 2-3 | Naturally present in the environment |
| E. coli | Oct - Dec 2016 | 76 | MPN/100mL | 3-218 | Human and animal fecal waste. |

MONITORED AT THE TREATMENT PLANT

| Contaminant | Violation | Date Collected | Level Detected | Unit of Measure | Range | MCL | MCLG | Likely Sources of Contaminants |
|-----------------------------------|-----------|----------------|----------------|-----------------|-------------|-----|------|---|
| Nitrate | No | 2/9/16 | 0.41 | ppm | n/a | 10 | 10 | Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits |
| Sodium | No | 7/20/16 | 6.15 | ppm | n/a | n/a | n/a | Erosion of natural deposits; used in water treatment |
| Turbidity ¹ | No | Daily | 0.25 | NTU | 0.025-0.250 | TT | n/a | Soil runoff |
| Total Organic Carbon ² | No | Monthly | 27% removed* | | | TT | TT | Naturally present in the environment |
| *(25% required) | | | | | | | | |

MONITORED AROUND THE DISTRICT

| Contaminant | Violation | Date Collected | Level Detected | Unit of Measure | Range | MCL | MCLG | Likely Sources of Contaminants |
|------------------------------------|-----------|----------------|-----------------|-----------------|-----------|--|------|---|
| Fluoride | No | quarterly | 0.42 | ppm | 0.32-0.55 | 4.0 | 4.0 | Erosion of natural deposits; water additive which promotes strong teeth; discharge from fertilizer and aluminum factories |
| Total Trihalomethanes ³ | No | quarterly | 53 highest LRAA | ppb | 16-92 | 80 LRAA | n/a | By-product of drinking water chlorination |
| Total Haloacetic Acids | No | quarterly | 58 highest LRAA | ppb | 20-109 | 60 LRAA | n/a | By-product of drinking water chlorination |
| Total Coliform Bacteria | No | daily | 1.2 | n/a | n/a | presence of coliform bacteria in 5% of monthly samples | 0 | Naturally present in the environment |

| Contaminant | Violation | Date Collected | Average | Unit of Measure | Range | MRDL | MRDLG | Likely Sources of Contaminants |
|-------------|-----------|----------------|---------|-----------------|-----------|------|-------|---|
| Chlorine | No | daily | 1.48 | ppm | 0.03-2.80 | 4.0 | 4.0 | Water additive used to control microbes |

MONITORED AT THE CUSTOMER'S TAP

| Contaminant | Violation | Date Collected | Level Detected | Unit of Measure | Range | MCL | MCLG | Likely Sources of Contaminants |
|--|-----------|----------------|----------------|-----------------|-----------|--------|------|--|
| Copper ⁴ | n/a | 2014 | 0.26 | ppm | 0.01-0.42 | AL=1.3 | 1.3 | Corrosion of household plumbing systems; erosion of natural deposits; leaching from wood preservatives |
| Lead ⁵ | n/a | 2014 | 0.5 | ppb | BDL-3.9 | AL=15 | 0 | Corrosion of household plumbing systems; erosion of natural deposits |
| *Level detected is 90th percentile of 30 households sampled in 2014. | | | | | | | | |

REGULATED VS UNREGULATED

The District is committed to protecting public health. To help advance the science of drinking water, we have been collecting data for the EPA. Collecting information about the occurrence of these compounds in water supplies is the first step in the EPA's efforts to determine whether they should be regulated. The presence of a compound does not necessarily equate to a health risk. We will closely monitor both the concentrations of these compounds and the EPA's health studies and will keep you informed of any developments. Should the EPA determine that regulation is warranted, we will take whatever steps are necessary to protect the health of our customers. For more information on the Unregulated Contaminant Monitoring Rule visit <http://water.epa.gov/lawsregs/rulesregs/sdwa/ucmr/>.

UNREGULATED CONTAMINANTS

MONITORED AT THE TREATMENT PLANT

| Contaminant | Date Collected | Level Detected | Unit of Measure | Range | Likely Sources of Contaminants |
|----------------------|----------------|----------------|-----------------|-----------|--|
| Chloroform | 6/28/16 | 49.3 | ppb | n/a | By-product of drinking water chlorination |
| Bromodichloromethane | 6/28/16 | 6.8 | ppb | n/a | By-product of drinking water chlorination |
| Chlorodibromomethane | 6/28/16 | 0.5 | ppb | n/a | By-product of drinking water chlorination |
| Vanadium | 2013-2014 | 0.18 | ppb | 0.0-0.4 | Discharge of drilling waste or metal refineries; erosion of natural deposits |
| Strontium | 2013-2014 | 110 | ppb | 100-120 | Discharge of drilling waste or metal refineries; erosion of natural deposits |
| Chromium, hexavalent | 2013-2014 | 0.07 | ppb | 0.06-0.08 | Discharge of drilling waste or metal refineries; erosion of natural deposits |

MONITORED AROUND THE DISTRICT

| Contaminant | Date Collected | Level Detected | Unit of Measure | Range | Likely Sources of Contaminants |
|----------------------|----------------|----------------|-----------------|----------|--|
| Vanadium | 2013-2014 | 0.18 | ppb | 0.0-0.04 | Discharge of drilling waste or metal refineries; erosion of natural deposits |
| Strontium | 2013-2014 | 104 | ppb | 98-100 | Discharge of drilling waste or metal refineries; erosion of natural deposits |
| Chromium, hexavalent | 2013-2014 | 0.09 | ppb | 0.08 | Discharge of drilling waste or metal refineries; erosion of natural deposits |

1. Turbidity is a measure of the cloudiness of the water. We monitor it because it's a good indicator of the effectiveness of our filtration system. We met the treatment technique for turbidity with 99% of daily samples below the limit of 0.15 NTU. 2. We met the treatment technique requirement for total organic carbon removal. 3. While your drinking water meets EPA's standard for trihalomethanes, it does contain low levels. Some people who drink water containing trihalomethanes in excess of the MCL over many years may experience problems with their liver, kidneys, or central nervous systems, and may have an increased risk of getting cancer. 4 Copper is an essential nutrient, but some people who drink water containing copper in excess of the action level over a relatively short amount of time could experience gastrointestinal distress. Some people who drink water containing copper in excess of the action level over many years could suffer liver or kidney damage. People with Wilson's disease should consult their personal doctor. 5. Infants and young children are typically more vulnerable to lead in drinking water than the general population. It is possible that lead levels at your home may be higher than at other homes in the community as a result of materials used in your home's plumbing. If you are concerned about elevated lead levels in your home's water, you may wish to have your water tested and flush your tap for 30 seconds to 2 minutes before using tap water. Additional information is available from the Safe Drinking Water Hotline (1-800-426-4791). Infants and children who drink water containing lead in excess of the action level could experience delays in their physical or mental development. Children could show slight deficits in attention span and learning abilities. Adults who drink this water over many years could develop kidney problems or high blood pressure.

WATER QUALITY PARAMETERS OF INTEREST

| Contaminant | Average Level Detected | Range | Likely Source |
|-----------------------|------------------------|----------|--------------------------------------|
| Alkalinity (ppm) | 72 | 55-92 | Erosion of natural deposits |
| Calcium (ppm) | 33.2 | 33.2 | Erosion of natural deposits |
| Hardness (ppm) | 98 | 82-160 | Erosion of natural deposits |
| Hardness (grains/gal) | 5.7 | 4.7-9.3 | Erosion of natural deposits |
| Iron (ppm) | 0.03 | 0.0-0.20 | Naturally occurring |
| pH | 7.2 | 6.9-7.5 | n/a |
| Phosphate (ppm) | 0.82 | 0.28-1.7 | Water additive for corrosion control |
| Temperature °F | 64 | 46-84 | n/a |

NON-DETECTED CONTAMINANTS

The following parameters were monitored at least once in the last 5 years, but not detected.

VOLITILE ORGANIC COMPOUNDS - Annually

Benzene, Carbon tetrachloride, 1,4-Dichlorobenzene, 1,2-Dichloroethane, 1,1-Dichloroethene, 1,1,1-Trichloroethane, Trichloroethene, Vinyl chloride, 1,2,4-Trichlorobenzene, cis-1,2-Dichloroethene, Xylenes (Total), Methylene chloride, 1,2-Dichlorobenzene, trans-1,2-Dichloroethene, 1,2-Dichloropropane, 1,1,2-Trichloroethane, Tetrachloroethene, Chlorobenzene, Toluene, Ethylbenzene, Styrene, Bromobenzene, Bromoform, Bromomethane, Chloroethane, Chloromethane, 2-Chlorotoluene, 4-Chlorotoluene, Dibromomethane, 1,3-Dichlorobenzene, 1,1-Dichloroethane, 1,3-Dichloropropane, 2,2-Dichloropropane, 1,1-Dichloropropene, 1,3-Dichloropropene, 1,1,1,2-Tetrachloroethane, 1,1,2,2-Tetrachloroethane, 1,2,3-Trichloropropane

SYNTHETIC ORGANIC COMPOUNDS

Last monitored in 2015: Alachlor, Atrazine, Simazine

RADIONUCLIDES

Last monitored in 2015: Gross Alpha, Gross Alpha-2 sigma, Radium 226, Radium 226-2 sigma, Radium 228, Radium 228-2 sigma

UCMR3

From 2013-2014 quarterly monitoring: Chlorate, Molybdenum, Cobalt, Chromium, 1,4-Dioxane, 1,2,3-Trichloropropane, 1,3-Butadiene, Chloromethane, 1,1-Dichloroethane, Bromomethane, HCFC-22, Bromochloromethane, Perfluorooctanesulfonic acid (PFOSA), Perfluorooctanoic Acid (PFOA), Perfluorononanoic acid (PFNA), Perfluorohexanesulfonic Acid (PFHSA), Perfluoroheptanoic Acid, (PFHpA), Perfluorobutanesulfonic Acid (PFBSA)

WATER QUALITY RESULTS TABLE DEFINITIONS:

- **AL** - Action Level, or the concentration of a contaminant which, when exceeded, triggers treatment or other requirements which a water system must follow.
- **BDL** - Below Detection Level laboratory analysis indicates that the contaminant is not present at a level that can be detected.
- **MCL** - Maximum Contaminant Level, or 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. To understand the possible health effects described for many regulated constituents, a person would have to drink 2 liters of water every day at the MCL level for a lifetime to have a one-in-a-million chance of having the described health effect.
- **LRAA** - Locational Running Annual Average, the arithmetic average calculated from the current and previous 3 quarters measurements.
- **MCLG** - Maximum Contaminant Level Goal, or 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.
- **MRDL** - Maximum Residual Disinfectant Level, The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for the control of microbial contaminants.
- **MRDLG** - Maximum residual disinfectant level goal. 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 contaminants.
- **NTU** - Nephelometric Turbidity Unit, nephelometric turbidity unit is a measure of the clarity of water. Turbidity in excess of 5 NTU is just noticeable to the average person.
- **ppb** - parts per billion or ug/L, micrograms per liter - explained as a relation to time and money as one part per billion corresponds to one minute in 2,000 years, or a single penny in \$10,000,000.
- **ppm** - parts per million or mg/L, milligrams per liter - explained as a relation to time and money as one part per million corresponds to one minute in two years or a single penny in \$10,000.
- **TT** - Treatment Technique, or a required process intended to reduce the level of a contaminant in drinking water.



THANK YOU

Thank you for allowing us to continue to provide your family with quality drinking water. We ask that all our customers help us protect our water sources, which are the heart of our community. If you notice something unusual or out of the ordinary, please contact us. As always, we welcome your questions and concerns.

Please share this publication with others who may use MSUD water and may not have received this notice, such as those in apartment buildings or community living.

This Report is available electronically at our website:

<http://msud.net/madison/madccr2017.pdf>.

You may also email waterplant@msud.net

or call 615-865-1636 to request a copy be mailed.

MADISON RIVERGATE

area chamber of commerce

**Join us as we advance our
community and economic prosperity.**

- **Convenience**—only 8 Miles from Downtown Nashville, Minutes from Opry Mills
- **Community**—affordable neighborhoods near shopping, schools, & entertainment
- **Commerce**—Madison Motor Mile, Rivergate Mall, Restaurants—Shop Local!

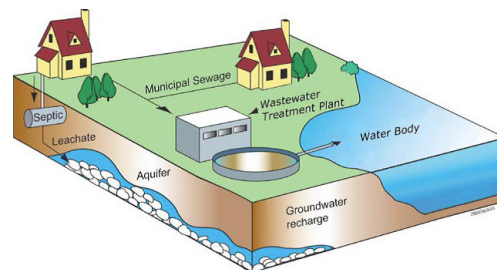
For More Information 865-5400
madisonrivergatechamber.com



Our time is now...

PROTECTING OUR WATER

The best and most cost-effective way to ensure safe water at the tap is to keep our source waters clean. Dispose of unused and old paint and motor oil at designated drop-off locations. These chemicals, if allowed to leach into the ground and pavement, eventually make their way to the river and into our drinking water.



THINK BEFORE YOU FLUSH!

Flushing unused or expired medicines can be harmful to your drinking water. Properly disposing of unused or expired medication helps protect you and the environment. Keep medications out of Tennessee's waterways by disposing in one of our permanent pharmaceutical take back bins. There are nearly 100 take back bins located across the state, to find a convenient location please visit:

www.tn.gov/environment/article/sp-unwanted-pharmaceuticals

Dispose Locally at:

Metro Police Department • Madison Precinct

400 Myatt Dr, Madison, TN

Monday - Friday: 8:00 am - 4:00 pm

Music on Main

Presented By




| | | |
|-----------------|---|----------------|
| June 1 | ● | 6:30 PM |
| June 15 | ● | 6:30 PM |
| July 6 | ● | 6:30 PM |
| July 20 | ● | 6:30 PM |
| August 3 | ● | 6:30 PM |

FREE CONCERT SERIES!

Bring your lawn chairs or blankets. Food vendors will be on site.




Sponsored By



All concerts will be held at Goodlettsville City Hall
located at 105 S. Main St.