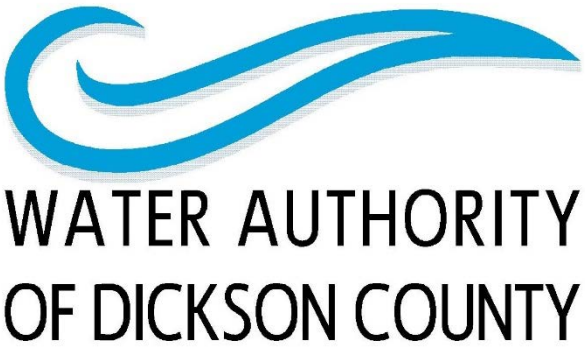
DROUGHT MANAGEMENT PLAN



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Revised, April 2025

Supersedes Drought Management Plan dated December 2023

APPROVALS

Approval – Water Authority of Dickson County:

Chief Executive Officer –  4/30/2025

Scott W. Miller Date

Approval – State of Tennessee:

TABLE OF CONTENTS

LIST OF TABLES

A. INTRODUCTION

A.1 Authority and Status to Plan

The Water Authority of Dickson County (WADC) was formed as a regional water and wastewater service provider in 2002 by the consolidation of the City of Dickson Water and Wastewater System, Turnbull-White Bluff Utility District, and Harpeth Utility District. Combining these entities resulted in centralized water service to approximately 75% of the land mass and population of Dickson County, as well as, portions of the surrounding counties. In 2006, WADC acquired the City of Fairview's Water and Wastewater system and later acquired the Wastewater Systems from the Town of White Bluff in 2015. Under Tennessee law, WADC is authorized to prepare this plan.

A.2 Statement of Purpose and Goals

The Water Authority of Dickson County (WADC) has the goal of maintaining a safe and reliable water supply to its customers, even in dry times of the year. Because WADC has made a significant investment in water production and distribution infrastructure, it is not specifically a goal for WADC to restrict water usage during dry times, but the goals are to be cognizant of the impending emergency situations, and be able to manage customer demands while monitoring water supply.

Droughts cannot be avoided, but their effects on water systems can be mitigated through proper planning and preparedness. This plan is not intended to replace existing emergency planning efforts, or to add complex layers of planning, measuring, and reporting to current operational procedures; rather, this plan is intended to supplement ongoing activities, and exercises within WADC, and other agencies in the area.

The goals of this plan include the following:

1) Detect and monitor a drought condition.
2) Project the longevity and severity of a water shortage or drought.
3) Establish trigger points or circumstances by which execution of mitigation steps must be taken by WADC, residential customers, commercial customers, industry and manufacturing customers, and supporting agencies.
4) Implement mitigation policies and actions that are fair, orderly, reasonable, and functional.
5) Protect the health of customers in monitoring water quality and notifying customers of any appropriate protective actions that they may need to take.
6) Remain in compliance with State and Federal Drinking Water Regulations during drought conditions.

7) Repair damaged system components, as priority dictates, to return the system to normal operating standards as soon as possible.

WADC's Drought Management Plan has four levels of response based on the severity of the water supply situation, as is discussed in Section D of this document. Water demands are split into critical and optional uses. Critical uses are those pertaining to human consumption, particularly those of the elderly care and assisted living facilities in the distribution system. Optional or "non-essential" uses are those associated with recreation and outdoor watering. A primary goal of the plan is to clearly delineate the difference between those uses.

A.3 Emergency Planning

While this document is prepared specifically to respond to anticipated supply issues that might arise due to a prolonged drought, the actions and preparedness put in place should be applicable to other emergencies as well. Since one source of water supply for WADC is the Cumberland River, which historically has not be inhibited by droughts, much of this document is tailored toward actions that might be taken and preparations that might be made for the more likely event of an ice storm similar to that experienced in 1994, or a flood similar to that experienced in 2010. In any case, the responses to impacted supply will be to decrease demand/system usage as necessary to maintain domestic service to customers as fully as possible.

Public water systems in Tennessee are required to have an Emergency Operations Plan (EOP). The Drought Management Plan is a necessary aspect of the EOP. The EOP will only reference this plan and encourage planners and personnel to use it when necessary. A complete listing of WADC's largest customers and the most critical customers can be found in the EOP.

This plan will use several system and climatological factors as trigger levels, including, but not limited to, water usage, tank levels, source water quality, and river flow. Precipitation deficits, drought indices, and seasonal drought assessments can be viewed at the U.S. Drought Monitor website, which focuses on broad-scale and local conditions. The website is located at https://droughtmonitor.unl.edu/.

A.4 Plan Management

WADC's Board of Commissioners has designated the Chief Executive Officer as the person in charge of implementation of its Drought Management Plan. Department supervisors/managers, field staff, legal department, and other administrative personnel may also be tasked with carrying out certain aspects of the

plan. Functional activation of the plan will begin once a "Drought Alert" has been issued per the implementation phases outlined in this document.

At that time, the Chief Executive Officer, as designated by the Board of Commissioners, will assign roles and functions to staff and will monitor and enforce the Drought Management Plan. All records will be maintained at the WADC's Service Center located at 101 Cowan Road, Dickson, TN.

Deactivation will follow the same rationale as activation, only in reverse order. Communication to the public shall be performed only by the Chief Executive Officer or his designee.

A.5 System Characteristics

WADC serves approximately 24,805 customers in a service area that covers 340 square miles in parts of Dickson and Williamson Counties. These include the cities of Dickson, Charlotte, Burns, and White Bluff in Dickson County, and the city of Fairview in Williamson County. WADC also wholesales water to the Sylvia-Tennessee City-Pond (STCP) Utility District also in Dickson County, serves a small area in River Road Utility, provides supplemental water to the Bon Aqua-Lyles Utility District in Hickman County, and has the ability to provide emergency water to the Second South Cheatham Utility District in Cheatham County.

Drinking water is obtained from four primary sources; three drinking water treatment plants and one interconnect with the Harpeth Valley Utilities District (HVUD). The interconnect with HVUD provides 11.2 million gallons per month and the three drinking water plants produce a combined 11.6 million gallons per day (MGD). With the exception of HVUD, the water sources come from three different watersheds. The Dickson WTP pulls water from Piney River in the Duck River Watershed, the Turnbull WTP pulls water from Turnbull Creek in the Harpeth River Watershed, and the Cumberland River WTP pulls water from the Cumberland River Watershed. The water that is provided by HVUD also comes from the Cumberland River Watershed. Water withdrawal from each of these streams is approximately half of the WADC's permitted limit, and these sources have proven to be very reliable over the years.

Table 1 provides general information on these treatment plants, and their raw water sources.

Table 1 – Water Withdrawal and Treatment

Description	Cumberland River WTP	Dickson WTP	Turnbull WTP
Source	Cumberland River (Cheatham Dam)	West Piney River	Big Turnbull Creek
Withdrawal Permit	5 MGD	2 MGD	4.5 MGD
Location	Mouth Johnson Creek Road, Charlotte, TN	N. Mt. Sinai Road, Dickson, TN	Thomas Road, Burns, TN
Treatment Type	Membrane Filtration (Direct)	Conventional Filtration with Enhanced Sedimentation (tube settlers)	Conventional Filtration with Enhanced Sedimentation (tube settlers)
Disinfection	Chlorination (NaOCl)	Chlorination (NaOCl)	Chlorination (NaOCl)

There are no known withdrawals upstream from WADC intakes in the West Piney River or Big Turnbull Creek, therefore WADC does not compete with other suppliers for water flowing in those streams. Both streams are fed by multiple springs prior to the intakes. The Cumberland River is competing with several large suppliers, such as, Nashville Metro, HVUD, and Ashland City. During the last drought, WADC did not experience a significant drop in flow in any of these streams.

The water distribution system has 775 miles of water main that range from 2” through 24” in diameter, eight booster pump stations, and seventeen water storage tanks with a combined capacity of 10 million gallons (MG). Refer to the EOP for the normal and emergency operation of this infrastructure.

The water usage in the distribution system normally ranges from five to seven million gallons per day (MGD), and the combined water withdrawal limit for the three WTPs is approximately 11.5 MGD.

Normal system operation is such that:

1) Dickson WTP produces drinking water for the City of Dickson, Charlotte, and the STCP Utility District.
2) Turnbull WTP produces drinking water for Fairview, which is supplemented by the interconnect with HVUD.
3) Cumberland River WTP produces drinking water for the remaining service area, and supplements Charlotte.

The distribution system is configured in zones and “back door” connections that provide a high level of flexibility to system operation should a WTP need to be taken offline for maintenance or repair. When this occurs, the other two WTPs carry the load. The WTPs can be run separately, or in conjunction with one another, to provide potable water to the entire system.

B. PLANNING

B.1 Priority in Services

The process of developing the Drought Plan is critical to the economy and health of the community. As such, public involvement is encouraged. Water conservation by WADC customers will be the primary focus of mitigation efforts. Public education and awareness is essential.

Customers can expect water mitigation and availability to be governed in the following order of priority:

- Health (medical, elderly, sanitation)
- Safety (fire protection)
- Environment (aquatic habitat)
- Economic (process, cooling)
- Recreation (pools, lawn/golf courses)

The WADC Chief Executive Officer shall have the authority to permit reasonable use of water to maintain public health, safety, and sanitary standards.

C. EXISTING PLANS AND PARTNERSHIPS

C.1 Interconnections and Mutual Aid Agreements

Regional drought conditions would affect water availability and quality state-wide. Interconnections between neighboring water systems would have to be carefully considered in regards to public health, fire protection, and system capacity. To date, interconnections are contractual and WADC is under no obligation to provide water to neighboring systems if in doing so creates undue hardship or compromises public safety to WADC customers.

The Chief Executive Officer shall have the right to determine what constitutes water waste, and may act when necessary to restrict the use of water or cut off same in order to stop such waste.

WADC shall have the right at any time by action of its Board of Commissioners to make changes and put into effect rules and regulations governing the use of water, as well as establishing, setting, and changing of fees.

C.2 Cooperative Agencies, and Legal Concerns

WADC’s drought management plan is available at the Business Office and on the WADC website.

WADC will maintain continuing contact with governmental agencies and water suppliers in the event that conditions warrant actions concerning the Drought Management Plan. Those entities include:

Other Water Systems

- Harpeth Valley Utilities District
- Sylvia-Tennessee City-Pond Utility District
- Second South Cheatham Utility District
- River Road Utility District
- Bon Aqua-Lyles Utility District

Governmental Agencies

- Dickson County Government
- Williamson County Government
- Dickson County EMA
- Williamson County EMA
- US Army Corps of Engineers

Regulatory Agencies

- TDEC – Division of Water Supply
- TDEC – Division of Water Pollution Control

D. PLAN MANAGEMENT PHASES AND RESPONSE

D.1 Drought Management Plan Phases

Following TDEC guidance in developing a Drought Management Plan, there are four distinct phases to drought emergencies:

1) Drought Alert Phase
2) Voluntary Water Reduction
3) Mandatory Water Restriction
4) Emergency Management

D.2 Trigger Points

Trigger points for initiating the Drought Management Plan or for moving from one phase to another are dependent upon WADC's ability to supply, and distribute the water. As a result, trigger points will have both a limited supply component, and an excessive demand component. Table 2 breaks down these phases, and provides a corresponding required action, alternative action, and mitigation goal.

Table 2: Drought Management Trigger Points and Action Plan

Phase	Observation	Trigger Point (Supply)	Trigger Point (Demand)	Required Action	Alternative Action	Mitigation Goal
Drought Alert	Lower than normal precipitation, declining water in Cheatham reservoir, and greater than normal demand	Nashville District of USACE issues a low flow alert	Customer demand exceeds 75% rated treatment capacity for more than 48 hours	1. Monitor source water supply and customer demand daily. 2. Monitor quality of raw water and finished waters 3. Notify TDEC of current drought management phase	1. Issue press release requesting customers conserve water 2. Share conservation tips (see Conservation Guide)	None
Voluntary Water Reduction	Declining flow and storage in Cheatham Reservoir, and continued increase in customer demand	Cheatham Reservoir level falls to 381.50' for over 48 hours.	Customer demand exceeds 80% of rated treatment capacity or available water supply for more than 48 hours *or* One of the three WTPs operate at or above 80% capacity for 7-10 consecutive days	1. Monitor source water supply and customer demand daily 2. Monitor quality of raw water and finished waters 3. Notify TDEC of current drought management phase 4. Issue press release that explains the current drought phase and requests a voluntary reduction in non-essential water use	1. Contact large users directly to request voluntary water reduction 2. Request a voluntary reduction in water use from all customers that is not directly related to health, safety, or welfare	Reduce customer demand to below 80% of water supply or rated treatment capacity
Mandatory Water Restriction	Continued declining flows in Cheatham Reservoir	Cheatham Reservoir level falls to 380.00' for over 48 hours.	Customer demand exceeds 85% of rated treatment capacity or available water supply for more than 48 hours *or* Two of the three WTPs operate at or above 80% capacity for 7-10 consecutive days	1. Monitor source water supply and customer demand daily 2. Monitor quality of raw water and finished waters 3. Notify TDEC of current drought management phase 4. Issue press release that explains the current drought phase and institutes a mandatory reduction in non-essential water use	1. Notify the public that water not required for health, safety, or welfare should be completely eliminated. 2. Lock meters that supply commercial and/or industrial water users where use is deemed not required for public health, safety, or welfare 3. Lock irrigation meters 4. Adjust billing rates for water	Reduce customer demand to below 85% of water supply or rated treatment capacity
Emergency Management	Continued declining flows in Cheatham Reservoir	Cheatham Reservoir level falls to 378.50' for over 48 hours.	Customer demand exceeds 90% of rated treatment capacity or available water supply for more than 48 hours *or* All three WTPs operate at or above 80% capacity for 3-5 consecutive days.	1. Monitor source water supply and customer demand daily 2. Monitor quality of raw water and finished waters 3. Notify TDEC of current drought management phase 4. Issue press release that explains the current drought phase and that all non-essential water use is prohibited and restrictions will be enforced.	1. Lock meters that supply commercial and/or industrial water users where use is deemed not required for public health, safety, or welfare 2. Lock irrigation meters 3. Adjust billing rates for water	Reduce customer demand to below 90% of water supply or rated treatment capacity

D.3 Implementation

The four drought management phases will be implemented by the Chief Executive Officer. As was done during the drought of 2007, and the flood of 2010, communication with neighboring systems shall become more frequent depending on the drought level as defined in this document. WADC staff monitors:

- Water pressures constantly via SCADA
- Tank Levels constantly via SCADA
- Daily pumpage at least once per day with real-time meters.
- Drought monitor website for updates and information
- Customer billing records
- USACE website for changes in Cheatham Reservoir level
- USGS stream monitors

This information will be used to determine the drought phase, and make recommendations to WADC Management regarding what levels are appropriate. The trigger points identified will be used in making such a recommendation.

During a drought event, the Chief Executive Officer, or appointed spokesperson, will be responsible for issuing public announcements via any communication format deemed suitable. This may include, but not be limited to, television, radio, printed releases, automated customer calling, website and social media. Contact information for each media outlet is include and kept current in the EOP, available to WADC personnel.

Press releases will be specific to the situation presented, and communication will coordinated State or Federal agencies.

Table 2 identifies the trigger points, actions, and goals for a system-wide drought scenario. The required action described here are considered the minimum action required once the associated trigger point has been reached. The alternative action identified are possible actions the Chief Executive Officer may choose to enact to enable WADC to meet stated goals.

The Chief Executive Officer may, at his or her discretion, elect to enter a particular phase prior to its trigger point being reached. Because it is impossible to plan for all circumstances, the Chief Executive Officer may amend the alternative actions during a drought event to meet a specific need of the community, better utilize available resources, or to comply with order or mandates issued by State or Federal agencies.

The Chief Executive Officer has the authority to end a phase once conditions no longer warrant contingencies.

D.4 Enforcement

The Chief Executive Officer is authorized to delegate the distribution of customer notices, conduct meter readings, and to shut off water to customers that do not comply with water restriction measures during a declared drought. If customers fail, or refuse to immediately comply with restrictions, service shall be cut off by WADC.

Any customer whose service is disconnected because of failure to comply with the requirements of a declared drought shall have the right, after the first such disconnection, to have service reinstated upon payment to WADC of customary reconnection charges, and upon execution of a written statement that the customer will comply with the requirements of the drought management plan. If service is disconnected because of subsequent failure to comply, such customers shall have the right to reinstatement of service only after approval of the Board and subject to such terms and conditions as the Board shall impose.

D.5 Water Quality

WADC has included raw and finished water quality among the parameters to be monitored as part of its drought plan. Taste and odor are the two most common water quality issues. WADC monitors customer complaints in regard to these issues on a consistent basis.

Treatment processes will be optimized to handle anticipated taste and odor concerns, and organic content will be closely monitored as well.

Flushing of distribution mains will be restricted to manage quality concerns only. Annual operation of hydrants and maintenance will be postponed until after the drought phase has been lifted unless directed by the Chief Executive Officer.

E. REVIEWS AND UPDATES

E.1 Reviews and Updates

Once a drought event is completed, regardless of which phase is reached, the Chief Executive Officer will implement a review of all actions leading up to the drought, and all actions undertaken during and immediately after the event. This Drought Management Plan shall be reviewed every three years, or when

any significant changes are made to the water system and updated as necessary. With every update, the plan will be sent to TDEC for approval and adopted by the Board of Commissioners.

F. CONSERVATION GUIDE

The following guidelines can be distributed to WADC customers at the initiation of a drought phase. Voluntary conservation measures include, but are not limited to, the following:

F.1 Outdoor Conservation:

1. Reduce the watering of lawns, shrubs, trees, and landscaped areas. As a general rule, established lawns do not need to be watered more often than every five to seven days.

2. A hearty rain eliminates the need for watering for up to two weeks. Buy a rain gauge, and use it to determine how much water/rain your yard has received.

3. Water lawns during the early morning hours when temperatures and wind speeds are the lowest. This reduces water losses from evaporation.

4. Don't allow sprinklers to water your street, driveway, or sidewalk. Position them so water lands on the lawn and shrubs, not the paved areas.

5. Install the most water-efficient irrigation devices for each use. Drip and micro irrigation and soaker hoses are examples of water efficient irrigation methods.

6. During dry weather, raise the height of your mower so that you are cutting your grass at the highest recommended height. A higher cut encourages grass roots to grow deeper, shades the root system, and holds soil moisture better than a closely clipped lawn.

7. Avoid over fertilizing your lawn. Fertilizer applications increase the need for water. Apply fertilizers which contain slow-release, water-insoluble forms of nitrogen.

8. Use mulch to retain moisture in the soil. Mulch also helps control weeds that compete with landscape plants for water.

9. Consider planting drought-tolerant grasses, ground covers, shrubs, and trees. Once established, they do not need to be watered as frequently and usually survive a dry period without watering. Group plants together based on similar water needs. Talk to the County Extension Service or your local nursery.

10. Do not hose down your driveway or sidewalk. Use a broom or blower to clean leaves and other debris from these areas.

11. Use a shut-off nozzle on your hose so that water flows only as needed. When finished, turn it off at the faucet instead of at the nozzle to avoid leaks. Check hose connectors to ensure plastic or rubber washers are in place. Washers prevent leaks.

12. Do not leave sprinkler or hose unattended. A garden hose can pour out several hundred gallons or more of water in only a few hours.

13. If you wash your car, park on the grass, and use a hose with an automatic shut-off nozzle.

14. Refrain from using water for ornamental purposes including fountains, artificial waterfalls, and reflecting pools.

F.2 Indoor Conservation:

1. Verify home is leak free. Many homes have hidden water leaks. To check your home for leaks, make sure no one in your home is using water, and then check your meter to see if water is flowing through the meter. If the flow indicator on the water meter is turning, there is a leak.

2. Check the toilets for worn out flappers, and replace (if necessary). These are the three ways to determine if you need to replace the flapper. 1) Add a dye tablet or dark food coloring to the toilet tank and wait 15 minutes. Do not flush. If the water in your toilet bowl changes color, replace the flapper, or 2) shut off water to the tank and flush. Once the tank is empty, touch the flapper. If a rubbery residue from the flapper comes off on your hand, replace the flapper, or 3) Once the toilet is full, turn the supply valve off, and wait one hour. If the water level in the toilet tank drops, replace the flapper.

3. Check the toilet for worn out, corroded, or bent parts. Most replacement parts are inexpensive, readily available, and easily installed.

4. If the toilet handle frequently sticks in the flush position letting water run constantly, replace or adjust it.

5. Install a toilet dam, or water displacement device such as a bag or bottle to reduce the amount of water needed for each flush. Be sure the installation does not interfere with the operating parts in the tank.

6. Take shorter showers, or alternatively take a shower by turning the water on to get wet; turning off to lather up; then turning the water back on to rinse off. Repeat when washing hair.

7. Operate automatic dishwashers and clothes washers only when they are fully loaded. Set the water level for the size of load you are using.

8. When washing dishes by hand, fill one sink or basin with soapy water. Quickly rinse under a slow-moving stream from the faucet.

9. Store drinking water in the refrigerator. Don’t let the tap run while you are waiting for cool water to flow.

10. Do not use running water to thaw meat, or other frozen foods. Defrost food overnight in the refrigerator, or use the defrost feature on your microwave.

11. Don’t let water run while shaving, or washing your face. Brush teeth first while waiting for water to get hot, then wash or shave after filling the basin.

12. Avoid flushing the toilet unnecessarily. Dispose of tissues, insects, or other similar wastes in the trash rather than the toilet.