DROUGHT MANAGEMENT PLAN
TOWN OF COLLIERVILLE

JUNE 9, 2016

PREPARED BY: TIMOTHY P. OVERLY – UTILITIES DIRECTOR

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STEP 1 – PREPLANNING

1.1 AUTHORITY AND STATUS TO PLAN

Under the Charter for the Town of Collierville, The Town has the authority under Article II, Section 2.02 (a)(35) "Do all things necessary to provide the Town sufficient and safe water; to provide for the regulation, construction, and maintenance of water works, settling basins, pumping stations, water pipes, mains, rights-of-way for the same, reservoirs, and all appurtenances, whether within or without the corporate limits of the Town; to provide for rates and assessments for water service and to provide and fix liens or penalties including withdrawal of services for refusal or failure of the party served to pay for same;". The Board of Mayor and Aldermen has the authority to approve Ordinances that sets the rules for governing the Town in the Town Charter under Article IV, Section 4.08 "All ordinances passed heretofore for the Town are hereby declared valid and binding and are continued in effect unless they conflict with this charter. Ordinances hereafter shall be passed in the following manner:

All ordinances except the budget ordinance, which shall be passed as set forth in Section 9.06, shall be passed on three (3) different days at a regular, adjourned, or called meeting of the board. Ordinances may be amended up to and at the third and final reading. A public hearing shall be held prior to or at the third and final reading of an ordinance, and notice of such hearing shall be published in a newspaper of general circulation within the community and posted at the town hall. Ordinances shall be made available for public inspection in accordance with general law. Each ordinance shall be effective upon final passage unless by its terms the effective date is deferred. Ordinances shall be signed by the mayor and shall be immediately taken charge of by the town clerk and by him numbered, placed in an ordinance book, and there authenticated by the signature of the town clerk and filed and preserved."

The Public Services Department, Utilities Division, has been granted the authority to administer and enforce the Ordinances of the Town that pertain to water and sewer. This authority is established in Chapter 51 of the Town of Collierville Code of Ordinances. Paragraph 51.01, Administration of Services – "(A) There is within the Public Services Department a division known as Public Utilities which will be responsible for providing the water and sanitary sewer services of the Town. (B) The Public Utilities Division shall be administered by a Director of Public Utilities, to be appointed by and to serve at the pleasure of the Board of Mayor and Aldermen.", paragraph 51.02, Application and Scope – "The provisions of this chapter are a part of all contracts for receiving water and/or sewer service from the municipality and shall apply whether the service is based upon contract, agreement, signed application or otherwise.", and paragraph 51.05, Enforcement – "enforcement of this chapter rests with the Public Utilities Director of the Town and his or her designee. " The Town has the right to restrict water usage under paragraph 51.63, Restricted Use of Water – "In times of emergencies or in times of water shortage, the municipality reserves the right to restrict the purpose for which water may be used by a customer and the amount of water which a customer may use."

1.2 SYSTEM CHARACTERISTICS AND RISKS

1.2.1 SOURCES

The Town of Collierville obtains all of its water from the Memphis Sands Aquifer.

1.2.2 RAW WELL WATER

The Town operates ten wells that range in depth from 280 feet to 635 feet. The wells have pumping capacities that range from 500 gallons per minute to 2850 gallons per minute.

1.2.3 WATER PRODUCTION

The wells feed five water treatment plants with a total treatment capacity of 23.6 million gallons per day and a high service pump capacity into the distribution system of 32.0 million gallons per day.

1.2.3 TREATMENT PROCESS

The treatment process consists of pumping the raw water from the wells through aerators for removal of any dissolved carbon dioxide and pH control. The water flows from the aerators into flash mix tanks where hydrated lime is fed to raise the pH of the water, sodium fluoride is fed to help prevent tooth decay and chlorine gas is fed to for disinfection of the water being distributed to the Town customers.

1.2.4 STORAGE CAPACITY

STORAGE TANK	CAPACITY (GALLONS)
Water Plant #1 Clear well	100,000
Water Plant #1 Elevated Tank	300,000
Water Plant #2 (Small Ground Storage)	300,000
Water Plant #2 (Large Ground Storage)	750,000
Water Plant #3	1,000,000
Water Plant #4	1,000,000
Water Plant #5	750,000
TOTAL STORAGE	**4,200,000**

1.2.5 BREAKDOWN OF WATER USAGE AND SEASONAL VARIATIONS

Collierville sells water to about 17,000 customers. Of those customers, only one is a neighboring municipality. The breakdown of the water sales for calendar year 2015 is listed in the table below:

CUSTOMER CATEGORY	AVERAGE DAILY USE (GALLONS)	% OF TOTAL	PEAK DAILY USE (GALLONS)	% OF TOTAL	INCREASE (PEAK OVER AVERAGE) (GALLONS)	% INCREASE (PEAK OVER AVERAGE)
RESIDENTIAL	4,107,929	73.08	6,294,713	73.74	2,186,784	53.23
MUNICIPAL	216,036	3.85	364,442	4.27	148,406	68.70
COMMERCIAL	1,119,373	19.91	1,619,690	18.97	500,317	44.70
INDUSTRIAL	52,412	0.93	98,693	1.16	46,281	88.30
TOWN	81,205	1.45	91,887	1.08	10,682	13.15
CHURCHES	44,100	0.78	67,135	0.78	23,035	52.23

1.2.6 WATER SYSTEM RISKS

Collierville's water system has a reliable water source in the Memphis Sands. The Memphis sands are up to 900 feet deep in the area and the water level in the aquifer has not suffered any significant drop in the last 20 years, due the large recharge area of the region.

Treatment and Distribution risks would be line breaks, equipment failure, weather related hazards, earthquakes and contamination. The Public Services Department, Utilities Division, has crews available to respond to all of the risks listed above and has access to crews from the Streets and Drainage Division of Public Services to assist in the event of a town wide disaster.

1.3 DROUGHT MANAGEMENT PLAN - STATEMENT OF PURPOSE

The Utilities Division's goal during a drought is to conserve its water supply source and production capabilities and reduce the effects of weather conditions and droughts on its customers. The Utilities Division's plan is designed to protect its water production and delivery systems while preserving service to its customers. Due to the unpredictable nature of climate and associated rainfall, it is reasonable and prudent that a Drought Management Plan (DMP) be available for implementation when such a need arises. The Utilities Division will use a stage approach in dealing with dry weather conditions and droughts and their associated impacts on its system and its customers.

The Utilities Division is committed to taking appropriate steps to avert and, if necessary, mitigate the effects of a drought, which could jeopardize public health, safety, and welfare, and cause economic hardships to its customers. Water conservation by its customers (residential, commercial, industrial, institutional, and municipal systems) will be the primary focus of these mitigation efforts. This staged approach will utilize system and drought stages as triggers. In addition, performance measures including but not limited to, water demands or usage, storage tank levels, precipitation deficits, and drought assessment maps will be considered. The system's management team will consider actual values for one

or more of the drought trigger points with the other factors listed above, in its best judgement, to determine the operative drought stage. The Drought Management Plan is designed to remain flexible and to accommodate procedures that would provide the most useful guidance and the ability to minimize the adverse impacts of a drought.

1.4 DROUGHT MANAGEMENT PLAN – INTERFACE WITH EMERGENCY OPERATIONS PLAN

Development of the DMP is a basic function of the Utilities Director's job function. The Utilities Division's staff has been an integral part in the development of the DMP. The Utilities Division's Emergency Response Manual (ERM) addresses contamination, line breaks, earthquakes, loss of system, storm events, nuclear war, civil disorder, chlorine release, fire, hazardous materials spill, as well as drought conditions. The DMP specifically addresses management of the water system in the event of droughts in more detail than the ERM.

Both the ERM and DRP have public notification provisions in the event a disaster or drought event is declared. All public notifications are handled by the Town's Public Information office.

STEP 2 – ORGANIZING THE PROCESS

2.1 PLANNING PROCESS

Development of the DMP is a basic function of the Utilities Director's job function. The Utilities Division's staff, has been an integral part of the development of the DMP. Approval authority of the DMP rests with the Board of Mayor and Aldermen under the Town Charter. Public review has been available as part of the Board of Mayor and Aldermen meetings.

2.1.1 PLANNING COMMITTEE

The planning process was led by the Utilities Director, with support from the Utilities Staff Engineer, Water Treatment Plant Manager and the Distribution/Collections Manager.

2.1.2 PLANNING PROCESS

The Utilities Division followed the TDEC document entitled *Guidance for Developing Community Water System Drought Management Plans* dated December 2009 in formulating this DMP.

2.2 PUBLIC INVOLVEMENT AND PUBLIC REVIEW

There will be a public hearing on the DMP prior to being presented to the Board of Mayor and Aldermen for approval. In addition, there is a 2 week public notice for any Board of Mayor and Aldermen meeting. The public has the right to comment on any item on the Board of Mayor and Aldermen agenda the day of the meeting.

2.3 IDENTIFICATION OF GOALS

The goal of the DMP is to maintain the supply of water throughout the water system in order to meet the water system's established objectives and priorities under increasing worsening drought conditions in order to minimize adverse effects on public health or safety, economic activity, environmental resources of life activity.

2.3.1 GOALS

A. To detect and monitor the type and severity of the situation;

B. To take the appropriate action in order to minimize adverse impacts, damage or losses, protest health and save lives;

C. To ensure water is safer to drink and establish a plan to notify customers of any necessary and appropriate protective actions;

D. To remain in compliance with state and federal Drinking Water Regulations during an emergency response; and

E. To address and repair damaged water system components in a prioritized schedule.

2.3.2 OBJECTIVES AND PRIOITIES

Water uses, in order of priority, are as follows:

A. Medical and Elderly and Critical Care Facilities

B. Human Consumption

C. Fire Protection

D. Animals

E. Environment

F. Commercial

G. Industrial

H. Recreation

I. Aesthetic

STEP 3 – IDENTIFY EXISTING PLANS, PARTNERSHIPS, POLICIES AND PROCEDURES

3.1 EXISTING EMERGENCY OPERATIONS PLANS AND DROUGHT MANAGEMENT PLANS

Collierville has for over 20 years, included drought management in its ERM and addressed water consumption during drought conditions in the Town's Code of Ordinances under Chapter 51.

3.2 INTERCONNECTIONS, MUTUAL AID AGREEMENTS AND BACKUP SERVICES

Collierville has one metered connection with Memphis Light, Gas and Water (MLGW) on Winchester Road that can supply 3,500 gallons per minute of water through a booster pump in the event that Collierville's system cannot meet water demand due to mechanical issues or drought. In addition to the metered connection, Collierville has two unmetered connections, one, eight inch connection at the west end of Frank Road and one, twelve inch connection on Holmes Road at Reynolds Road.

3.3 ORDINANCES, POLICIES, LEGAL REQUIREMENTS

There are no new rules, ordinances, policies or legal requirements that affect this planning process.

STEP 4 – COORDINATE WITH STATE OR REGIONAL AGENCIES OR OTHER CWSs

4.1 REGIONAL STAKEHOLDERS

A. Tennessee Department of Environment & Conservation (TDEC), Division of Water Resources

B. City of Piperton

C. Memphis Light, Gas & Water

D. Collierville Fire Department

4.2 LIMITING FACTORS

Collierville's water system is a groundwater system, not under the direct influence of surface water. The source is not a limiting factor, since 100% of Collierville's water comes from the Memphis Sands. The limiting factor for Collierville is the well and high service pump capacities of the water treatment plants.

Collierville can currently treat up to 23.6 million gallons per day of water and pump at a rate of 32.0 million gallons per day of water into the distribution system. Collierville's system has 4.2 million gallons of water storage.

Collierville can purchase water from MLGW at a rate of 5.0 million gallons per day. The amount of water that can be purchase from MLGW is limited to the capacity that MLGW has available for sale.

Collierville sells water to the City of Piperton under a contract that limits the amount of water purchased per month to 12.5 million gallons. Piperton is subject to water use restrictions exactly the same as an inside Collierville customer.

STEP 5 – PLAN MANAGEMENT PHASES AND TRIGGER POINTS

5.1 DROUGHT MANAGEMENT PHASES

Collierville has formulated its DMP in accordance with TDEC guidelines. Drought alerts will be issued by TDEC as determined through the US Drought Monitor. The US Drought Monitor is maintained by the National Drought Mitigation Center at the University of Nebraska – Lincoln.

Collierville will monitor the US Drought map to determine the level(s) of drought within Collierville's service area as posted on TDEC's website http://state.tn.us/environment/water.

5.2 TRIGGER POINTS

Collierville's DMP will have four trigger points:

Trigger Point #1	Drought Alert and/or System Demand at 75% of Pumping or Production Capacity
Trigger Point #2	Moderate Drought Alert and/or System Demand at 85% of Pumping or Production Capacity
Trigger Point #3	Severe Drought Alert and/or System Demand at 90% of Pumping or Production Capacity
Trigger Point #4	Extreme Drought Alert and/or System Demand at 95% of Pumping or Production Capacity

5.3 ACTIONS TO BE TAKEN WITH TRIGGER POINTS

Trigger Point #1 — Collierville to monitor the drought stages and system demands on an instantaneous basis, as well as, a 24 hour production basis.

Trigger Point #2 — Collierville to request customers voluntarily reduce water consumption by 15%.

Trigger Point #3 — Collierville to institute mandatory water restrictions and prohibit the following activities:

Restrictions:

A. Watering of lawns, flowers and/or vegetable gardens, trees, shrubs, etc. are restricted to assigned days of the week and/or certain hours of the day by odd/even address numbers.
B. Watering of fairways on any golf course and all ball/athletic fields restricted to certain hours of the day (if using Town water).
C. Normal fire hydrant flushing and testing restricted to 50% of the schedule.

D. Water systems under contract will be notified to have their customers restrict water use as specified for Trigger Point #3.

Prohibited:

A. Washing sidewalks, driveways, parking areas, tennis courts, patios, or any other impervious surfaces by commercial, industrial or residential customers, except for sanitary or safety purposes.
B. Non-commercial washing of privately own vehicles, trailers or boats.
C. Use of water for dust control.
D. Firefighting training classes.

Trigger Point #4

Mandatory water restrictions and prohibitions as stated in Trigger Point #3, plus the following restrictions and prohibitions:

Restrictions:

A. Commercial nurseries, garden centers and vegetable gardens will be restricted to absolute minimum usage to keep plants alive.
B. Watering of golf course tees and greens, right of ways, ball fields and landscaped entryways to subdivisions, storefronts, etc. may be allowed on certain days, as granted by the Utilities Division (if using Town water).
C. Water systems under contract will be notified to have their customers restrict water use as specified for Trigger Point #4.
D. Industries shall be restricted to 75% of their normal daily usage based on their average daily usage for the past 12 months.

Prohibited:

A. All non-state mandated line flushing by the Utilities Division and Fire Department.

STEP 6 – PLAN FOR IMPLEMENTATION

6.1 MONITORING SUPPLY AND DEMAND

The Utilities Division will monitor the following in addition to the actions in STEP 5:

6.1.1 Water pressure in the distribution system.

6.1.2 Tank and clearwell levels.

6.1.3 Perform daily inspections of the distribution system for violations of the water use restrictions and prohibited uses.

6.2 PLAN ACTIVATION

The Utilities Division will inform the public of the DMP activation through the Town's Public Information Office. The Public Information Office disseminates information through press releases, emails, social media and the Town's website.

6.3 COMPLIANCE AND ENFORCEMENT

The authority to enforce the provisions of the DMP is delegated to the Utilities Director by the Board of Mayor and Aldermen in the Town Code of Ordinances, Chapter 51, Section .05 " 51.05 Enforcement of this chapter rests with the Public Utilities Director of the Town and his or her designee."

In Paragraph 51.98 of the Town Code of Ordinances it states "(A) It shall be unlawful for any person to violate any provision of this chapter."

There will be staged enforcement of the DMP:

First Offense – Warning issued to the customer (verbal and/or door tag)

Second Offense – Warning in writing, including notice of potential service disconnection and/or $50 fine

Third Offense – Service will be disconnected and a possible fine of up to $50

STEP 7 – MANAGEMENT TEAM

7.1 MEMBERS

The Utilities Director will be responsible for monitoring and implementing the DMP. Team members, who will be charged with implementation of the DMP includes, The Public Services Director, Water Treatment Manager and Distribution/Collections Manager. In the absence of the Utilities Director, the Public Services Director will be responsible for monitoring and implementing the DMP.

7.2 ACTIVATION

The Management Team will be activated when Trigger Point #1 is reached.

7.3 ROLES AND FUNCTIONS

Roles and functions will be determined on a case by case basis, depending on Team member availability and projected drought duration and severity.

7.4 RECORDS AND DOCUMENTATION

The Utilities Director will maintain the documentation of the drought. The information recorded includes:

A. Date when DMP was initiated and when additional trigger points are reached.
B. Daily production and maximum instantaneous demands.
C. Daily storage tank levels.
D. Log of customers violating restrictions in the DMP.
E. Date when the different drought stages have been lifted.

7.5 DEACTIVATION

The Utilities Director will monitor each drought situation and determine when the phases may be lifted and when the DMP can be deactivated.

STEP 8 – REVIEW

8.1 EVALUATION OF PLAN EFFECTIVENESS

Once a drought event is over, the Utilities Director will initiate a review with the Management Team of all the DMP actions, records and results to determine the effectiveness of the DMP during the event.

8.2 UPDATE PLAN

If after evaluation of the DMP effectiveness, there are areas that need to be improved the DMP will be updated and at a minimum, the DMP will be reviewed and updated every 3 years.

8.3 ADOPT UPDATED PLAN

After each time the DMP has been updated, it will be presented to the Board of Mayor and Aldermen for adoption.

STATE OF TENNESSEE
DEPARTMENT OF ENVIRONMENT AND CONSERVATION
DIVISION OF WATER RESOURCES
Memphis Environmental Field Office
8383 Wolf Lake Drive
Memphis, TN 38133
1-888-891-8332

June 9, 2016

Mr. Tim Overly, Public Utility Division Director
Collierville Water System
500 Keough Road
Collierville, TN 38017

Re: Drought Management Plan Approval
Collierville Water System
PWSID #0000126
Shelby County

Dear Mr. Overly:

The Division of Water Resources has received your correspondence and submittal of the Drought Management Plan dated June 9, 2016. The plan addresses the requirements of the Division's Guidance for Developing Community Water System Drought Management Plans and is hereby **Approved.**

If you have any questions concerning this matter, please contact me directly at 901-371-3015.

Sincerely,

Gharib A. Khan

Gharib A. Khan
Division of Water Resources
Memphis Environmental Field Office

cc: TDEC/DWR/MEFO: file