



# Memphis Light, Gas & Water Division

## DROUGHT MANAGEMENT PLAN

September 2022

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# Step 1: Preplanning

## 1.1 Authority and Status to Plan

The Memphis Light, Gas & Water Division (MLGW) and its Board Light, Gas & Water Commissioners (the Board) were created by Chapter 381 of the Private Acts of 1939, incorporated as Article 65 into the Charter and Related Laws of the City of Memphis. That initial legislation was subsequently amended by various Private Acts of the Tennessee Legislature and by Home Rule Referendum.

Section 679 of the Charter and Related Laws, grants the following authority:

*The said light, gas and water commissioners shall have the power and authority to construct, purchase, improve, operate and maintain, within the corporate limits of the City of Memphis or elsewhere within the limits of Shelby County, a water plant or system, including, without limitation, wells, pumping plants, reservoirs, pipes, and all accessory apparatus, buildings and lands, rights of way and easements, and all other appurtenances usual to such plants or systems, for the purpose of producing, distributing, supplying or selling water to the City of Memphis, or to any person, firm, public or private corporation, or to any other user or consumer, in the City of Memphis or elsewhere in Shelby County. (Private Acts 1939, Ch. 381, §5.)*

Therefore, MLGW and the Board are authorized under Tennessee Law to develop a Drought Management Plan.

Furthermore, the Board is empowered to approve service policy governing all customers who wish to receive electric, gas, or water services from MLGW. MLGW's current Electric, Gas & Water Service Policy Manual, subsection 1.8.1 provides:

### ***DISCONTINUANCE OF ELECTRIC, GAS OR WATER SERVICE WITHOUT NOTICE***

*MLGW will discontinue immediately, and if necessary, without notice, electric, and gas or water service to any existing customer when in MLGW's opinion any of the following exist:*

- 1. The continued furnishing of service would be detrimental to the safe and continued operation of the distribution system or to the adequacy of supply to existing customers or could present an unsafe or hazardous condition to any person or property.*

Therefore, with the adoption of an official Drought Management Plan, MLGW reserves the right to:

1. Define conditions that would be detrimental to the safe water supply for all MLGW customers,
2. Specify restrictions on the usage of water service at the residential, commercial, or industrial level based upon various severity levels of inadequate water supply, and
3. Enforce punitive actions on customers who refuse to comply with the notification of water consumption restrictions including monetary fees and disconnection of water service.

The MLGW Drought Management Planning Committee will be made up of the following positions:

- Senior VP and Chief Operating Officer
- VP of Engineering and Operations
- VP of Design, Construction and Delivery
- VP of Community & External Affairs
- Water Matrix Manager
- Manager, Water Engineering and Operations Department
- Manager, Water Quality Assurance Laboratory
- Manager, Systems Operations Department
- Supervisor, Systems Operations, Gas and Water
- Supervisor, Water Engineering Area
- Supervisor, Water Operations Area
- Lead Water Production Engineer, Water Engineering Area
- Crisis Management Coordinator

The government officials who will approve the final draft of this plan will be the MLGW Board of Commissioners.

## **1.2 Statement of Purpose of the MLGW Drought Management Plan**

The purpose of this plan is to ensure MLGW supplies consistent, reliable, and safe drinking water to meet the needs of all residential, commercial and industrial customers of MLGW in Memphis and Shelby County\*. This plan will outline a two-pronged approach to achieve this goal:

- 1) Reducing the demand/load of the water system by implementing water usage restrictions.
- 2) Consideration of options to supplement the available water supply.

With this plan, MLGW seeks to not only to protect the health and well-being of customers within it's service territory within the City of Memphis and Shelby County, but also to sustain economic and social activities that depend on an adequate, safe supply of water. In an effort to support these goals, MLGW has developed this Drought Management Plan (DMP) which shall define actions to be taken in the event that Memphis and Shelby County experiences any period in which an adequate supply of safe, abundant water is unavailable.

Due to the unpredictable nature of earthquakes, tornados, extended periods of extreme heat or cold, and possible terrorism, such a plan must be designed to account for severe loss of potable drinking water that could arise from these types of extreme events. Based upon the severity level of any potential lack of water supply in the future, a key group of water crisis response team personnel will determine what steps should be taken to restrict public water consumption for uses deemed “non-essential” until the MLGW water supply can be restored to normal levels.

\*NOTE: MLGW’s Drought Management Plan is only developed for the City of Memphis, City of Arlington, City of Lakeland, and Unincorporated Shelby County. This plan does not cover the Cities of Millington, Bartlett, Collierville, and Germantown who each own and operate their own water systems.

## **1.3 MLGW Water System Characteristics and Risks**

### **1.3.1 SOURCE**

MLGW obtains the majority of its raw water supply from the Memphis Sand aquifer with a smaller percentage coming from the Fort Pillow Sand aquifer.

### **1.3.2 RAW WATER FROM WATER PRODUCTION WELLS**

MLGW maintains 10 different wellfields which comprise approximately 140 water production wells.

### **1.3.3 WATER PRODUCTION**

The wellfields feed 10 different Water Treatment Plants, also referred to as Water Pumping Stations. These water treatment plants are capable of producing 258 million gallons of treated water per day.

Each Water Treatment Plant is designated by the amount of water it is permitted to treat (filter) per the Tennessee Department of Environment and Conservation (TDEC), listed in Table 1 as the Treatment Capacity. Table 1 also shows the Pumping Capacity, which represents the total pumping rate of all of that station’s High Service Pumps, and the Reservoir Storage capacity, which is the amount of water that can be stored at the water plant.

**TABLE 1**

Water Pumping Station	Treatment Capacity (MGD)	Pumping Capacity (MGD)	Reservoir Storage (MG)	Area of Shelby County Served
<b>1. <u>Mallory</u></b>	35	75	10	Downtown, Midtown, North County, Westward Communities in the I-240 Loop
<b>2. <u>Sheahan</u></b>	35	64	20.1	Communities inside the I-240 Loop, East Memphis
<b>3. <u>Allen</u></b>	30	75	20	Downtown, South Memphis, President's Island, Westward Communities Inside the I-240 Loop
<b>4. <u>McCord</u></b>	35	60	10	Northeast County, East County, Communities South Outside of the I-240 Loop
<b>5. <u>Lichterman</u></b>	30	70	10	Hickory Hill, East Memphis, South to Stateline Rd.
<b>6. <u>Davis</u></b>	30	70	10	West County, Pidgeon Industrial Park, Whitehaven
<b>7. <u>Morton</u></b>	30	50	10	North County, Northeast County, Northward Communities Outside the I-240 Loop
<b>8. <u>Shaw</u></b>	30	72	15	East County, Northeast County, Lakeland, Arlington
<b>9. <u>Palmer</u></b>	5.5	8	2	Whitehaven
<b>10. <u>LNG-Arlington</u></b>	1.1	1.1		Northeast County

The three-phase water treatment process includes aeration, filtration and chemical addition. For chemical addition, Sodium Hypochlorite is added as the disinfectant, Fluoride is added to fight tooth decay, and Sodium Hexametaphosphate is added as the corrosion inhibitor. The three-phase water treatment process oxidizes various elements, increases pH, and removes impurities.

#### 1.3.4 STORAGE CAPACITY

The storage capacity of MLGW's water system is comprised of: 1) The sum of the water storage reservoirs at each of the Water Pumping Stations listed in TABLE 1 previously (approximately 108 MG), and 2) the Overhead Storage Tank capacity of MLGW's 15 elevated storage tanks listed in TABLE 2 below:

**TABLE 2**

<b>ELEVATED TANK</b>	<b>Overhead Storage* (GAL) *Overflow volume is less than Overhead Storage Capacity</b>	<b>Overflow Elevation (FT above sea level)</b>
<b>1. Arlington</b>	<b>400,000</b>	<b>448.0'</b>
<b>2. Arlington LNG</b>	<b>350,000</b>	<b>363.0'</b>
<b>3. Baker (Locke)</b>	<b>250,000</b>	<b>493.5'</b>
<b>4. Capleville</b>	<b>100,000</b>	<b>510.0'</b>
<b>5. Cloverhaven</b>	<b>100,000</b>	<b>424.0'</b>
<b>6. Egypt Central (Raleigh North)</b>	<b>500,000</b>	<b>452.5'</b>
<b>7. Farris (Mudville)(Casper Creek)</b>	<b>150,000</b>	<b>493.5</b>
<b>8. Frayser</b>	<b>500,000</b>	<b>415.0'</b>
<b>9 Holmes Road</b>	<b>500,000</b>	<b>530.0'</b>
<b>10. Palmer</b>	<b>300,000</b>	<b>451.5'</b>
<b>11. President's Island</b>	<b>500,000</b>	<b>407.0'</b>
<b>12. R.E. "Doc" Gallagher (James Park)</b>	<b>500,000</b>	<b>527.0'</b>
<b>13. Raleigh-Millington (Raleigh South)</b>	<b>300,000</b>	<b>452.5'</b>
<b>14. Raney (Redwood)</b>	<b>250,000</b>	<b>493.5'</b>
<b>15. Stonebridge</b>	<b>500,000</b>	<b>527.0'</b>
<b>TOTAL (GALLONS)</b>	<b>5,200,000</b>	

**TOTAL SYSTEM STORAGE CAPACITY = APPROXIMATELY 112.3 MG**

### 1.3.5 BREAKDOWN OF WATER SYSTEM CUSTOMERS

MLGW sells water to roughly 254,000 customers. MLGW has metered interconnections to sell water to four neighboring municipalities if they need load support for their systems: Germantown, Bartlett, Collierville, and Olive Branch, MS. The breakdown for MLGW's water sales for 2021 calendar year is listed in the table below\*\*:

**TABLE 3**

<b>CUSTOMER CATEGORY</b>	<b>AVERAGE DAILY USE (MG)</b>	<b>% OF TOTAL</b>	<b>PEAK DAILY USE (GALLONS)</b>	<b>% OF TOTAL</b>	<b>INCREASE (PEAK OVER AVERAGE) (MG)</b>	<b>% INCREASE (PEAK OVER AVERAGE)</b>
RESIDENTIAL	44.40	45.1%	79.49	45.1%	35.09	79.0%
COMMERCIAL	50.98	51.7%	91.27	51.7%	40.29	79.0%
OTHER	3.15	3.2%	5.64	3.2%	2.49	79.0%

\*\* MLGW does not have daily water data by class. Utilizing peak day actual (176.4 MGD) with % split from average

### 1.3.6 SEASONAL VARIATION IN DEMAND

The base peak season demand period for MLGW’s water system load is considered to be approximately June 1<sup>st</sup> to August 31<sup>st</sup> each year. Obviously, these start and end dates can and will change based upon how mild or how extreme the seasonal temperatures are each year, coupled with the amount of rainfall that precedes June 1<sup>st</sup> and follows August 31<sup>st</sup>. For the purposes of this plan, this base time period will be used to show seasonal variations in demand. The “off-peak” season for water system demand will be the remaining months for this 12 month period.

The average daily demand/consumption during the base peak period from 2020 to 2021 has been 138.9 MGD, or 53% of maximum water system treatment capacity per day.

The average daily demand/consumption during the “off-peak” period from 2020 to 2021 has been 117.5 MGD, or 45% of maximum water system treatment capacity per day.

### 1.3.7 RISKS TO THE MLGW WATER SYSTEM

MLGW’s water system has potentially one of the most reliable water sources in the United States via the Memphis Sand Aquifer.

The potential risks to the supply of water requiring a drought management plan can be broken down into four categories: mechanical failure, terrorism, forces of nature, or an extended period of extremely hot temperatures.

- 1) Mechanical Failure: It is a daunting task to have 140 water production wells functioning 100% of the time. If too many water production wells are out-of-service for any given wellfield, or if by chance, more than one of MLGW’s Water Treatment Plants had to be taken off-line, these conditions could simulate a drought scenario for MLGW. MLGW’s eight (8) large Water Treatment Plants and two (2) small Water Treatment Plants (Table 1) are interconnected via the water distribution system. This interconnectivity allows for stations to

share load and shed load. The loss of one station would not endanger the available water supply to our customers.

- 2) **Terrorism:** The deliberate breaching of one of MLGW's water pumping stations and the purposeful act of terrorism could make it necessary for MLGW to isolate a significant portion of our water distribution system, which could be the equivalent of shutting down more than one Water Pumping Station; thus, simulating a drought situation.
- 3) **Forces of Nature:**
  - a. Large magnitude earthquake from the New Madrid Seismic Fault could and most likely would cause substantial damage to MLGW's water distribution system and raw water supply system. The amount of time to repair all of these potential breaks would be substantial.
  - b. A large Tornado system traversing Shelby County could severely damage more than one water pumping station, which would severely hinder the amount of available water supply to the public, thus simulating a drought condition.
- 4) **Extended Periods of Extremely Hot or Cold Temperatures:** The normal mode of operation is to pump water from the reservoirs during the day. Then, late at night and into the early morning hours, the reservoirs are replenished by bringing in more raw water than the high service pumps are pumping out. If there were extended days of extremely hot weather that increased the window of high water demand and prevented the reservoirs from replenishing, a drought scenario could be created. The same can hold true with a prolonged period of extremely cold weather. If subfreezing temperatures happen at the same time a snow or ice storm takes out power, then freezing pipes can burst and cause a major load on the system until all leaks (mains and customer pipes) are isolated.

## **1.4 Drought Management Plan and Water Emergency Response Plan**

Development of MLGW's DMP will serve as a supplemental guide to MLGW's Water System Emergency Response Plan (Water ERP).

The purpose of the Water System Emergency Response Plan (ERP) is to insure an effective, professional, well-organized response to a natural disaster or major water system incident by following the NIMS/ICS guidelines and structures. The primary objectives of the plan are to protect the public safety and to minimize customer inconvenience and health issues due to water service interruption.

Many of the "Risks to the Water System" described in section 1.3.7 of this DMP above, are already established trigger points in the MLGW Water ERP to suggest both an emergency activation of MLGW's Water Crisis Response Team as well as a review of this DMP. The trigger points in the MLGW Water ERP that suggest diminished water supply indicators include:

1. Natural Disaster such as an earthquake, tornado, flood, etc.
2. System demand is approaching supply capability.
3. Unexplained deviation of 10 MGD in total system pumping rate.
4. Unexplained decrease of 7 psi in supply pressure at any water pumping station.
5. Inability to refill elevated storage tanks to set overflow level overnight for unexplained reasons.
6. A real or suspected breach of security, sabotage, or other suspicious activities involving a water pumping station.

The Drought Management Plan is referenced in the Water System ERP but is presented as a free-standing, separate document because drought conditions (the equivalent of severe loss of water supply) may or may not be remedied by imposing water consumption restrictions. This cannot be known until the cause is identified by the Systems Operations Department working in conjunction with the Water Crisis Response Team.

MLGW immediately integrates itself with the local Shelby County Emergency Management Agency (EMA) by assigning its staff of crisis management coordinators to serve as Liaison Officers to EMA during a crisis event. Public communications are disseminated by MLGW's Public Information Officer (PIO) to our media partners, as well as collaborating with EMA's PIO to have a unified, consistent message to the public.

# Step 2: Organizing the Planning Process

## 2.1 Planning Process

MLGW followed the TDEC Outline and Planning Checklist titled “DWS – NEFO 2010” as a guide for writing this DMP, and the TDEC document titled “Guidance for Developing Community Water System Drought Management Plans – Updated June 2016”.

## 2.2 Planning Committee

The following members of the MLGW Water Crisis Team had input into the drafting of this document:

- Senior VP and Chief Operating Officer
- VP of Engineering and Operations
- VP of Design, Construction and Delivery
- Manager of Legal Services
- Manager, Water Engineering and Operations Department
- Supervisor, Water Operations Area
- Supervisor, Water Engineering Area
- Water Matrix Manager
- Manager, Water Quality Assurance Laboratory
- Manager, Systems Operations Department
- Supervisor, Gas & Water, Systems Operations Department
- Crisis Management Coordinator

### 2.2.1 PUBLIC INVOLVEMENT AND PUBLIC REVIEW

The MLGW Board of Commissioners must review this plan and have an official agenda item set for this issue at one of its future meetings, open to the public for review and comment. A majority vote to approve this plan would be followed with the approval of minutes at the next Board meeting.

All fines, fees, and service disconnections provided for in the approved Drought Management Plan will be contained in MLGW’s Electric, Gas and Water Service Policy Manual and Schedule of Charges. This MLGW Drought Management Plan will be available on the company’s public website at: <http://www.mlgw.com/>

## 2.3 Identification of Goals

The goal of the DMP is to maintain the supply of water encompassing MLGW's water service territory during severely decreasing water supply events (drought). Keeping MLGW's water supply at serviceable levels is critical in minimizing adverse effects on public health, fire safety, economic activity, as well as environmental resources.

### 2.3.1 GOALS

- 1) To detect and monitor any unexpected decrease in water system supply;
- 2) To take appropriate action to minimize adverse impacts, damages, losses, protect public health, and save lives;
- 3) To ensure water is safe to drink and establish a plan to notify customers of any necessary and appropriate protective actions;
- 4) To remain in compliance with state and federal Drinking Water Regulations during an emergency response; and
- 5) To address and repair damaged water system components in a prioritized manner.

### 2.3.2 OBJECTIVES AND PRIORITIES

Water usage, in order of priority, is as follows:

- 1) Hospitals and Medical Facilities
- 2) Nursing Homes and Elderly Care facilities
- 3) Human Consumption (drinking water, domestic cooking, bathing, toilet use)
- 4) Fire Protection (structural facilities and hazardous situations)
- 5) Farming (livestock/agricultural)
- 6) Environmental (Erosion, Aquatic, Habitat)
- 7) Commercial (Restaurant, Laundry, Office, Retail)
- 8) Industrial (Sanitation, Process, Cooling)
- 9) Recreation (Pools, Spas, Athletic Fields, Golf Courses, Fountains)
- 10) Landscaping (shrubbery) Watering (Home and Commercial)
- 11) Lawn Watering, Vehicle Washing (Home and Commercial)

# Step 3: Identifying Existing Plans, Partnerships, Policies, and Procedures

## 3.1 Interconnections, Mutual Aid Agreements, and Backup Sources

### 3.1.1 PORTABLE WATER DISINFECTION INFORMATION

Under an EMA/Office of Preparedness Full Emergency Operations Center Activation, MLGW can obtain further assistance from the Shelby County Emergency Management Agency/Office of Preparedness – particularly (from MLGW’s Water ERP):

**ESF 3 Infrastructure:** Building inspection, route clearance, bridge inspection, debris removal, as well as water and wastewater systems. This is usually represented by County and City Public Works Officials, as well as MLGW’s Crisis Management Coordinator for issues regarding City, County, and Arlington potable water issues only.

### 3.1.2 INTERCONNECTIONS

MLGW has system interconnection points and metered connections at multiple locations with several adjoining municipalities. If a “drought” situation occurred such that MLGW’s water system service territory was greatly impacted, while surrounding municipalities were not (such as a tornado system destroying MLGW water facilities in our service territory, but leaving other surrounding municipalities intact), then MLGW would work through its local Shelby County Emergency Management agency to coordinate with the water utility leaders of the other municipalities to determine the most effective way of augmenting the MLGW water supply through accessing available resources at the following area partners listed in section 3.3 below.

1. Germantown Water System
2. Bartlett Water System
3. Collierville Water System
4. Millington Water System
5. Poplar Grove (Tipton County) Utility District

### 3.1.3 MUTUAL AID

According to Tennessee State law, all capable water purveyors within the state of Tennessee must respond to mutual aid requests from another in-state agency in need of assistance. T.C.A. § 58-8-101. However, given the scenario of a drought, or other severe event (earthquake, tornado damage, etc.) that could significantly diminish MLGW’s water supply capability, it is likely that mutual aid may need to come from outside this region

and across state lines. It would be under circumstances such as this in which MLGW would work through the local Shelby County EMA to take advantage of the EMAC\* process:

1. MLGW is anticipating that it must have support from other agencies outside the region of Tennessee to meet potable drinking water demands.
2. MLGW's Operation and Planning Section Chiefs work with technical and construction water subject matter experts to calculate the quantity of crews/manpower needed, what capabilities they must have, equipment needs, a description of the working conditions, an estimate of how long MLGW anticipates needing these outside resources, and the address of the arrival/staging area, and forwards all of this information to MLGW's Liaison Officer (Crisis Management Coordinator) to pass along to the local EMA office.
3. This request for aid will be sent to the state level at TEMA for processing by the EMAC Director.
4. EMAC Director will take the aid request and have EMAC personnel at the State level fill out a requisition A form. There will be no delay in applying Tier I typing for resources by EMAC personnel because utility aid is categorized as Tier II, and thus is not subject to FEMA resource typing.
5. EMAC Director will send out emails to all states specified emergency management EMAC Directors asking for response/proposals with costs from other utilities for MLGW to review.
6. MLGW will review all proposals and will choose which utilities it will accept aid from and alert the Tennessee EMAC Director to approve receiving aid from those chosen utilities.

\*NOTE: The EMAC stands for the Emergency Management Assistance Compact. It is the avenue for agencies to request aid through their state emergency management agency to other agencies from out of state for assistance.

## **3.2 Ordinances, Policies, and Legal Requirements**

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

## **3.3 Existing Partnerships**

1. Germantown Water System
2. Bartlett Water System
3. Collierville Water System
4. Millington Water System
5. Poplar Grove (Tipton County) Utility District
6. Shelby County Emergency Management Agency
7. Memphis Office of Emergency Management

# Step 4: Coordination with State and Regional Agencies

In the event that the DMP is activated, MLGW will maintain continuing contact with the following local and regional agencies, and governing bodies:

## 4.1 Regional Stakeholders:

1. Tennessee Department of Environment & Conservation (TDEC)
  - a. Division of Water Supply
  - b. Division of Water Pollution Control
2. Shelby County Emergency Management Agency/Office of Preparedness
3. Memphis and Shelby County Mayors' Offices
4. All Shelby County Municipal Fire Fighting Agency Leaders
5. All Shelby County Municipal Law Enforcement Agencies
6. Memphis and Shelby County Health Department
7. Memphis and Shelby County Public Works Departments
8. Memphis City Council
9. Local Coast Guard/Port Authority Leadership
10. Partnering Community Water Systems
  - a. Town of Collierville
  - b. City of Germantown
  - c. City of Bartlett
  - d. City of Millington
  - e. Town of Arlington
  - f. City of Olive Branch, MS

## 4.2 Limiting Factors:

MLGW's water system is a groundwater system, not under the direct influence of surface water. The limiting factors for the MLGW water system are the serviceability of water production wells, high service pumps, and filters at Water Treatment Plants. Previously, Table 1 in section 1.3.3 under "WATER PRODUCTION" gave the treatment, and pumping capacities. Table 2 in section 1.3.4 under "STORAGE CAPACITY" gave the total water capacity by adding the water pumping station reservoirs capacities to the overhead water storage tank capacities.

MLGW sells water to the City of Bartlett, the Town of Collierville, the City of Germantown, and the City of Olive Branch, MS. All are subject to water usage restrictions exactly as other MLGW customers.

# Step 5: Plan Management Phases and Response

## 5.1 Identification of Trigger Points

MLGW has derived its Drought Management Plan using the TDEC Guidelines as a source of information. Drought alerts will be issued by TDEC as determined through the U.S. Drought Monitor. The U.S. Drought Monitor is maintained by the National Drought Mitigation Center at the University of Nebraska- Lincoln.

MLGW will monitor the US Drought map to determine the levels of drought within MLGW's service territories as posted on TDEC's website <http://droughtmonitor.unl.edu/>.

MLGW's DMP will have four trigger points:

- |                   |  |
|-------------------|--|
| Trigger Point # 1 | (Drought Alert) System Demand at 80% of Treatment/Production Capacity              |
| Trigger Point # 2 | (Voluntary Reduction) System Demand at 85% of Treatment/Production Capacity        |
| Trigger Point # 3 | (Mandatory Reductions) System Demand at 90% of Treatment/Production Capacity       |
| Trigger Point # 4 | (Emergency Water Management) System Demand at 95% of Treatment/Production Capacity |

## 5.2 Balancing Supply and Demand

\*As was mentioned in section 4.2, MLGW's limiting factor on water supply comes from supply capacity versus demand rather than drought conditions given the unique source of MLGW's water supply. This is not to say that MLGW will not observe the drought alerts as mentioned above, just that the trigger points below will be based upon MLGW production capabilities versus the system demand as a ratio/percentage. Monitoring one peak day would not be an accurate measurement of what the water demand versus supply looks like because that is based upon such a small sample size.

The demand versus capacity ratios will be used as triggers for the plan if such percentages are reached as an average calculated value over a 14 consecutive day period.

TDEC’s Drought Management Plan list four distinct phases to drought emergencies:

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

<b><u>Drought Alert Phase:</u> System Demand reaches 80% of daily treatment/production capacity as an average calculated value over a 14 consecutive day period.</b>	
<b>Trigger #1: “Drought Alert”</b>	System Demand at 80% of total treatment/production capacity
<b>Customer Outreach</b>	<ul style="list-style-type: none"> <li>• Begin Corporate Communications Public Service Announcements about water conservation.</li> <li>• Place pre-made water saving tip informational inserts into billings/mailings.</li> <li>• Place water conservation tips on the front page of MLGW’s Public Web Page Site.</li> </ul>
<b>Reduction Goal</b>	None
<b>Monitoring Activities</b>	<ul style="list-style-type: none"> <li>• Monitor Daily Water Demand</li> <li>• Monitor Weather Forecast</li> <li>• Monitor Equipment Out of Service</li> <li>• Monitor TDEC US Drought Map at least once every 12 hours.</li> </ul>
<b>Enforcement Actions</b>	None – Notify TDEC’s Division of Water Supply

<b><u>Voluntary Reduction Phase: System Demand reaches 85% of daily treatment/production capacity as an average calculated value over a 14 consecutive day period.</u></b>	
<b>Trigger #2: “Voluntary Reduction”</b>	System Demand at 85% of total treatment/production capacity
<b>Customer Outreach</b>	<ul style="list-style-type: none"> <li>• Ask Customers to limit non-essential water uses; e.g., watering lawns, washing cars, shorter showers, not running the water while brushing teeth, maximizing dish and laundry loads, etc.</li> <li>• Inform adjoining community water systems that MLGW may be unable to provide water in either an emergency capacity or as a supplement to their water systems.</li> <li>• Have Corporate Communications prepare messages for local TV media to discuss the importance of water conservation and that the MLGW DMP has officially been activated to “voluntary reduction level”. Put water DMP goals, rules, and possible upcoming restrictions into pamphlet for bill mailings.</li> <li>• Touch base with Director of EMA about status</li> </ul>
<b>Reduction Goal</b>	Reduce Demand by 5% - 10%: Overall Treatment Capacity is approx. 258 MGD
<b>Monitoring Activities</b>	<ul style="list-style-type: none"> <li>• Monitor Daily Water Demand</li> <li>• Monitor Weather Forecast</li> <li>• Monitor Equipment Out of Service and request expedited/emergency repair resources</li> <li>• Monitor any situations EMA might be addressing</li> <li>• Monitor TDEC US Drought Map at least once every 12 hours.</li> </ul>
<b>Enforcement Actions</b>	None – Notify TDEC’s Division of Water Supply

**Mandatory Reduction Phase: System Demand at 90% of daily treatment/production capacity as an average calculated value over a 14 consecutive day period.**

<p><b>Trigger #3: “Mandatory Reduction”</b></p>	<p>System Demand at 90% of daily treatment/production capacity Notify/put on standby MLGW Water Crisis Team Send Liaison Officer to EMA if they decide to activate</p>
<p><b>Customer Outreach</b></p>	<ul style="list-style-type: none"> <li>• Notify customers that non-essential water use (watering lawns, washing cars, golf courses, athletic outdoor ball fields, etc.) will be limited to certain days and between certain hours.</li> <li>• Absolutely no washing of vehicles, sidewalks, patios, parking areas, or use of water for dust control by any category of customer.</li> <li>• No flushing of fire hydrants except for water quality issues</li> <li>• No Firefighting training exercises other than classroom learning</li> <li>• Inform adjoining community water systems that MLGW will be unable to provide water in either an emergency capacity or as a supplement to their water systems and to keep each other informed of demand vs supply levels.</li> <li>• Customers can report non-essential use of water to MLGW Customer Care Center.</li> <li>• Re-task Corporate Security and Revenue Protection to patrol low water pressure zones for water-usage violations</li> <li>• Have MLGW Key Account Reps work with their respective commercial and industrial customer contacts to ensure that water reduction measures are being taken.</li> <li>• Corporate Communications to use TV Media outlets, Facebook, Twitter, home webpage, and all social media platforms to inform customers of mandatory reduction level activation for DMP. Also remind customers of mandatory water restrictions and associated penalties.</li> <li>• Touch base with EMA/OEM, ESF-14 and ESF-16 (Volunteers and Animal Welfare) if there are any tanker delivery/filling needs for livestock, animal shelters, etc.</li> </ul>
<p><b>Reduction Goal</b></p>	<p><b>Reduce Demand by 10% - 15%</b> Assume overall treatment capacity is still at 258 MGD</p>
<p><b>Monitoring Activities</b></p>	<ul style="list-style-type: none"> <li>• Monitor Daily Water Demand/System Response:</li> <li>• Monitor SCADA pressure point telemetry</li> <li>• Begin regular, visual inspection of reservoir capacities, and daily inspection of water pumping station aerators and filter process. Re-task Water Engineering and Operations personnel to assist.</li> <li>• Via Corporate Communications, broadcast PSA’s instructing customers to report water restriction violations to 544-MLGW, and inform MLGW’s employees to also report water restriction violations. Then, have Revenue Protection and other identified areas to investigate.</li> <li>• Have the Customer Care Center coordinate with Manager of the Water Lab to monitor water quality complaints.</li> <li>• Monitor TDEC US Drought Map consistently.</li> </ul>
<p><b>Enforcement Actions</b></p>	<ul style="list-style-type: none"> <li>• Contact TDEC’s Division of Water Supply to Notify</li> <li>• First Offense: written warning with a door tag with a list of the mandatory restrictions, with a checkmark by the applicable violation/phone call.</li> <li>• Second Offense: written citation in formal mailing with a checkmark by the applicable violation along with a \$25 DMP fee added to their utility bill and a warning of potential water disconnection for any future offenses.</li> <li>• Third Offense: written citation in formal mailing along with a \$50 DMP fee added to their utility bill and notification that their water service will be disconnected for any future violations. Warn of future service disconnection.</li> </ul>

**Emergency Water Management Phase: System Demand at 95% of daily treatment/production capacity as an average calculated value over a 14 consecutive day period.**

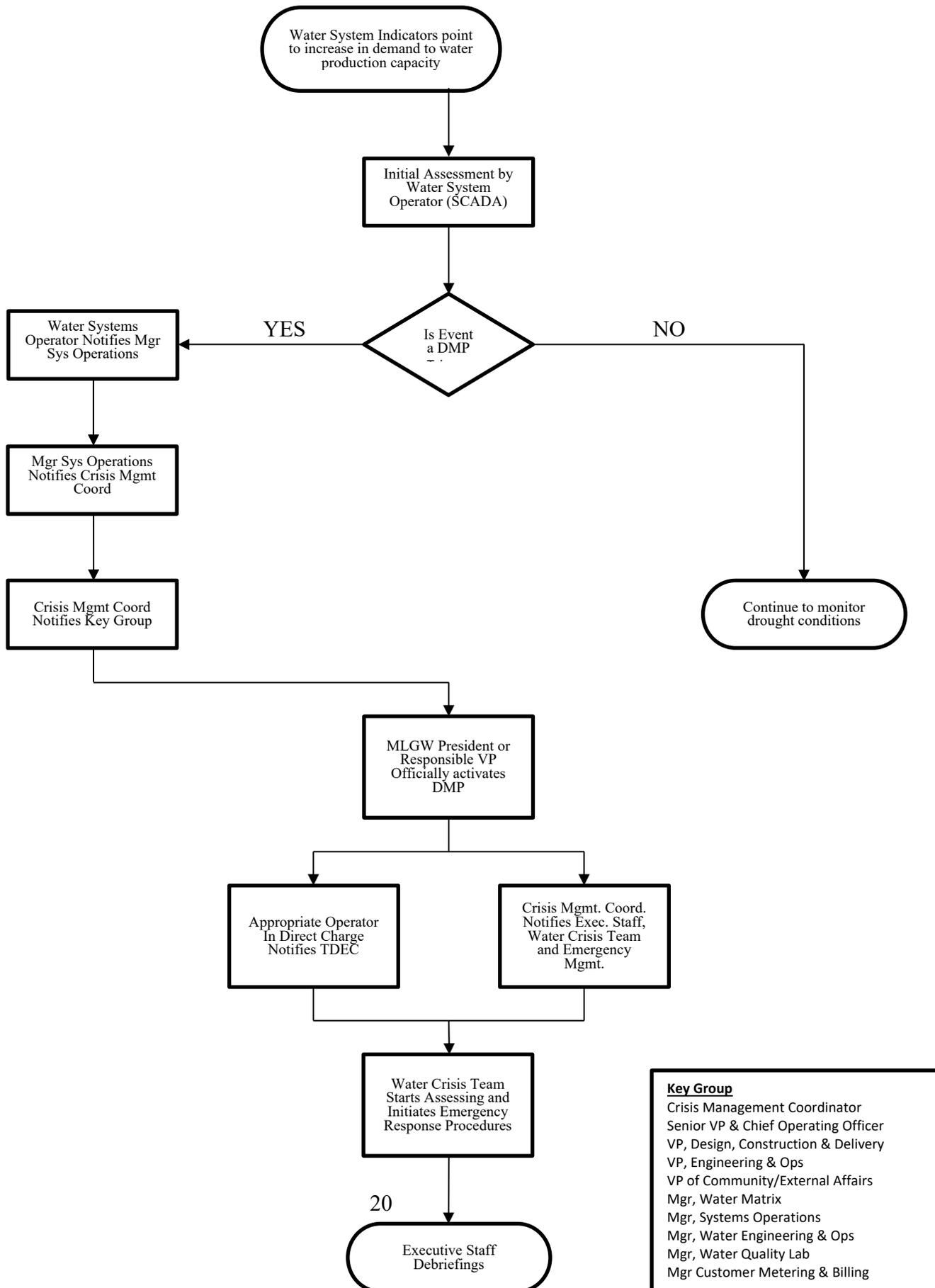
<p><b>Trigger #4: “Emergency Water Management”</b></p>	<p>System Demand at 95% of pumping or production capacity Water Key Group may activate the MLGW Water Crisis Team** Send Liaison Officer to EMA if they decide to activate</p>
<p><b>Customer Outreach</b></p>	<ul style="list-style-type: none"> <li>• Notify customers that non-essential water use (watering lawns, washing cars, golf courses, athletic outdoor ball fields, etc.) will be prohibited until demand versus supply levels are back to Trigger point 3.</li> <li>• Absolutely no washing of vehicles, sidewalks, patios, parking areas, or use of water for dust control by any category of customer.</li> <li>• No flushing of fire hydrants except for water quality issues</li> <li>• No Firefighting training exercises other than classroom learning</li> <li>• Inform adjoining community water systems that MLGW will be unable to provide water in either an emergency capacity or as a supplement to their water systems.</li> <li>• Customers can report non-essential use of water to MLGW Customer Care Center.</li> <li>• Re-task Corporate Security and Revenue Protection to patrol low water pressure zones for water-usage violations</li> <li>• Have MLGW Key Account Reps work with their respective customer contacts to ensure that water reduction measures are being taken....</li> <li>• C&amp;I Customers who do not use water for the production of goods/services must cut back to 75% usage based upon the average of last 12 months usage.</li> <li>• Commercial nurseries, garden centers, and vegetable gardens will be restricted to absolute minimum usage to keep plants alive.</li> <li>• Corporate Communications to use TV Media outlets to inform customers of emergency reduction level activation for DMP. Also remind customers of mandatory water restrictions and associated penalties.</li> </ul>
<p><b>Reduction Goal</b></p>	<p>Reduce Demand by 15% - 20% Assume overall treatment capacity is still at 258 MGD</p>
<p><b>Monitoring Activities</b></p>	<ul style="list-style-type: none"> <li>• Monitor Daily Water Demand</li> <li>• Have the Customer Care Center coordinate with the Manager of Water Lab to monitor water quality complaints</li> <li>• Monitor TDEC US Drought Map consistently.</li> <li>• Have scatter plot run for any reported water quality complaints</li> </ul>
<p><b>Enforcement Actions</b></p>	<ul style="list-style-type: none"> <li>• Contact TDEC’s Division of Water Supply to Notify</li> <li>• First Offense: written warning with a door tag with a list of the mandatory restrictions, with a checkmark by the applicable violation/phone call.</li> <li>• Second Offense: written citation in formal mailing with a checkmark by the applicable violation along with a \$50 DMP fee added to their utility bill and a warning of potential water disconnection for any future offenses.</li> <li>• Third Offense: written citation in formal mailing along with a \$75 DMP fee added to their utility bill and notification that their water service will be disconnected for any future violations. Warn of future service disconnection.</li> <li>• Fourth Offense: written citation in formal mailing along with a \$100 DMP fee added to their utility bill and disconnection of water service.</li> </ul>

**While the Trigger Points in this DMP document accelerate awareness and actions at all levels of management and operations, the decision to formally activate the MLGW Water Crisis Team will be discussed and may occur. Many unknown conditions would play a role:**

- 1) Are the operable water production wells running without maintenance issues?
- 2) What is the future weather forecast?
  - a. Precipitation chances
  - b. Future hot temperatures and heat indices
  - c. Future cold temperatures and winter storm forecast
- 3) Are we seeing a positive effect on water demand reduction, or do the imposed curtailments seem to have little effect?
- 4) Are we seeing repeated water quality issues?
- 5) Due to the dry conditions and perhaps heat, are we seeing an increase in firefighting activities across the county?
- 6) What is the demand versus supply conditions of our neighboring municipalities?
- 7) Are we smoothly addressing non-traditional public water consumption needs through EMA or is there a disconnect?

## 5.3 Plan for Implementation

MLGW Drought Management Plan Activation Chart



# Step 6: Identify the Management Team

## 6.1 Members

The MLGW Drought Management Team (key group) will be made up of the following positions:

- Senior VP & Chief Operating Officer
- VP of Design, Construction & Delivery
- VP of Engineering and Operations
- VP of Community/External Affairs
- Manager, Water Matrix
- Manager, Water Engineering and Operations Department
- Manager, Water Quality Assurance Laboratory
- Manager, Systems Operations Department
- Manager, Customer Metering and Billing
- Crisis Management Coordinator

### 6.1.1 ROLES

Given that MLGW is a NIMS/ICS compliant municipality, all company title positions are followed in parenthesis by their associated ICS title in an emergency situation.

VP of Engineering and Operations: (Incident Commander). Presides over debriefing meetings if and when a water crisis event has been declared due to DMP levels.

VP of Design, Construction and Delivery: (Deputy Incident Commander). Relieves IC during rotating shifts or to fill in if the IC is unavailable.

VP of Community and External Affairs: (Public Information Officer): Coordinates all media messaging, public information and education efforts about this DMP plan.

Water Matrix Manager: (Operations Section Chief): Oversees any damage assessment issues. The quick repair of any key water distribution mains would be crucial in a drought scenario.

Water Engineering and Operations Manager: (Work Planning Branch Director): Oversees the operations and repairs of any water production equipment issues: water production pumps, water treatment plants, booster pumps, storage tanks, etc.

Manager Water Quality Assurance Lab: (Regulatory Compliance Branch Director): Oversees the investigation and testing of any water quality complaints. Also is the point of contact for reporting compliance issues with the state.

Manager of Systems Operations: (Planning Section Chief): Oversees all operations of the SCADA system, water control room, coordination and accounting of dispatched work units

to account for water system impacts, notifications of system issues to upper management and key crisis team personnel.

Crisis Management Coordinator: (Liaison Officer): Point of contact for EMA and all other emergency response agency leaders. Becomes the ESF coordinator if the County EMA decides to activate the County EOC.

# Step 7: Review, Evaluate, and Update the Management Plan

**7.1 Date plan was adopted** \_\_\_\_\_

## **7.2 Activation Review**

If this plan is activated, there will automatically be a post-mortem meeting by the DMP Team to discuss any possible changes to the plan that would help its effectiveness. If there are any changes, and a new draft of the plan is created, then it will be forwarded to TDEC for review within a 6-month time period.

## **7.3 Three Year Review**

This plan will be reviewed and updated every 3 years. There will also be a review if there is a significant update to the MLGW water production system.

<p><i>Reviewed By: Jeff Embry, Water System Specialist, Water Engineering &amp; Operations</i> <i>Date: 6/30/2022</i></p>
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