

UPPER OCONEE BASIN WATER AUTHORITY DROUGHT MANAGEMENT POLICY/CONTINGENCY PLAN

The Upper Oconee Basin Water Authority (Authority) and its member governments – Athens-Clarke County, Barrow County, Jackson County, and Oconee County – have prepared this Drought Management Policy/Contingency Plan in accordance with the Georgia Department of Natural Resources Environmental Protection Division's (EPD) Rules and Regulations for Water Quality Control, Chapter 391-3-6, in effect at the time of the adoption of this Policy/Plan. A copy of that EPD rule is attached as Appendix A to this document.

Drought Condition Indicators

The Authority will use the following drought condition indicators, in addition to other appropriate indicators, as part of the decision making process outlined within this document:

1. Streamflow levels (current versus historic)
2. Soil moisture content (current versus historic as measured by the Palmer Hydrologic Drought Index (PHDI))
3. Reservoir storage or levels (current)
4. Rainfall accumulation (current versus historic and 90-day outlook)

Drought Management Actions

The identification of drought severity stages, the need for drought management actions, and the selection of drought responses levels will be determined by the Authority Board based upon recommendations from the Joint Engineering/Operations Committee which will consider outputs from the Authority's Bear Creek Reservoir Drought Management Water Supply Model (Model) in formulating such recommendations.

The Model is a proactive, highly flexible computer simulation that allows the Authority to consider different probable streamflows, levels of water usage, durations of drought protection period, low flow protection, etc. to effectively manage the Bear Creek Reservoir during periods of low streamflow. The referenced Model is the basis of this updated Drought Management Policy/Contingency Plan and the Authority's efforts to ensure water availability to the member governments. The Model is intended solely as a management tool and is not intended to replace or update the hydrologic model on which the Authority's withdrawal permits are based.

Selection of the projected streamflow trend range will consider the following primary indicators:

1. Actual streamflow during the previous 90-day period relative to the historic streamflow in the Middle Oconee River as indicated by the Arcade United States Geological Service (USGS) gage (02217475) and the Middle Oconee USGS gage (02217500) located near Mitchell Bridge Road, and in the North Oconee River as indicated by the North Oconee USGS gage (02217770) located near College Avenue.
2. Actual Palmer Hydrologic Drought Index (PHDI) during the previous 90-day period compared to the historic PHDI during prior significant periods.
3. Actual rainfall during the previous 90-day period compared to the historic rainfall.
4. 90-day rainfall outlook from National Weather Service Climate Prediction Center (CPC).

The anticipated drought protection period will be the duration of time from the beginning of a potential drought through November 30 of that same calendar year. The anticipated water usage needs of each member government during the anticipated drought protection period will be the actual monthly average day and monthly maximum day usage of the member government during the same drought protection period in the previous non-drought year, plus any documented increase resulting from new residential and/or commercial customers. Each member government will be expected to submit its monthly average day and monthly maximum day for each month during the previous 12 months, plus the above noted proposed adjustments for growth, by no later than March 30th of each year for use with the upcoming drought protection period evaluation.

The Authority, through the Joint Engineering/Operations Committee, will utilize their Model to assess and manage the reservoir, following their Georgia EPD-approved *Bear Creek Reservoir Management Guidance Document* (*Guidance Document*) and included as Appendix B to this document. At a minimum, the Authority staff will monitor the primary indicators on a monthly basis and keep the Model updated to current conditions. These current conditions will be reported on a monthly basis to the Joint Engineering/Operations Committee. As resources permit and potential new indicators become available, improvements to the Model may be made by the Authority.

Drought Severity Stages

The drought severity stages will be designated by the Authority Board based upon a recommendation from the Joint Engineering/Operations Committee. The purpose for designating drought severity stages is to provide advance warning to the member governments and the public of potential drought conditions and potential water usage reductions based on hydrological and meteorological conditions.

The Joint Engineering/Operations Committee will recommend drought severity stages utilizing parameters and designations as outlined below. Once the Authority has designated a drought

severity stage, Authority staff will so advise the member governments and the general public. Further, the Joint Engineering/Operations Committee will begin to meet, on a frequency determined to be appropriate by the Chairpersons of the Engineering and Operations Committees, to evaluate the need for modification of the drought severity stage.

These severity stages range from less severe, Stage A1, to most severe, Stage D3. When indices are trending towards a significant drought event, the Authority's staff and/or Joint Engineering/Operations Committee may choose to run the Model more frequently than noted above.

Using the current member government allocations, the reservoir begins to deplete when streamflow rates are below the 40th percentile probability, water usage is at the full allocation share, and the anticipated drought protection period is greater than 120 days. Therefore, the 40th percentile streamflow rate probability and/or 120-day anticipated drought protection period are considered critical points at which to evaluate drought severity stages. PHDI probabilities ranging from the 25th to 10th percentiles also are used to develop drought severity stages. These percentiles were developed through a review of the PHDI values associated with moderate to extreme drought conditions using the Palmer classifications for drought severity, where the 25th percentile typically aligns with a PHDI value of -2, and the 10th percentile aligns with PHDI values of -3.

Stages of drought severity, relative streamflow, PHDI probabilities, and CPC Rainfall Outlooks to be utilized within the Authority's Model, are shown in Table 1.

Table 1. Drought Severity Stages and Associated Streamflow Probabilities, PHDI Probabilities, and CPC Rainfall Outlook

Sub-Level	CPC Rainfall Outlook	Stage A PHDI <25%	Stage B PHDI <20%	Stage C PHDI <15%	Stage D/ Emergency PHDI <10%
Non-drought		Q _p > 40%			
1	Above Normal	Q _p = 35-30%	Q _p = 30-25%	Q _p = 25-20%	Q _p = 20-15%
2	Normal	Q _p = 30-25%	Q _p = 25-20%	Q _p = 20-15%	Q _p = 15-10%
3	Below Normal	Q _p = 25-20%	Q _p = 20-15%	Q _p = 15-10%	Q _p = 10-5%

CPC - National Weather Service Climate Prediction Center
Q_p - streamflow percentile probability

PHDI - Palmer Hydrologic Drought Index percentile probability

Conditions or Events for Declaration of Drought Response Levels and Water Use Reductions

When current and/or projected water use demands and fire protection requirements of users of the Bear Creek Reservoir exceed, or are projected to exceed, the availability of water supply due to drought conditions in an anticipated drought protection period, a drought water use reduction condition will be deemed to exist, and the Joint Engineering/Operations Committee will notify the Authority Board that there is a need for water use reductions and recommend a Drought Response Level. Drought Response Levels and associated water use percent reduction ranges shown in Table 2 will be considered for implementation.

Table 2. Drought Response Levels and Water Use Percent Reduction Ranges

Drought Response Levels	Water Use Percent Reduction
1	0-5
2	6-10
3	11-15
4	16-20
5	>20

The Authority Board will subsequently determine appropriate collective water use reduction actions and Authority staff will so advise the member governments and the public.

Depending on the time of the year that a drought emergence is trending (based on the monitoring of the primary indicators and water supplies), the Authority Board will make its determination as to the actions necessary to retain adequate water supply to avoid or relieve local water shortages. Once a drought response level has been determined, the Joint Engineering/Operations Committee will meet, on a frequency determined to be appropriate by the Chairpersons of the Engineering and Operations Committees in coordination with the Chairperson of the Authority Board, to review the latest climatic indicators and water supply conditions and possibly render a determination that the drought severity stage and/or drought response level needs to be raised, reduced, or lifted. Drought progression will predominantly track the streamflows which will result from precipitation events and changes in soil moisture content (PDHI). While short-term precipitation may begin trending towards normal, drought

effects will linger in the soil moisture and streamflows. The major indication of drought conditions ending will be if streamflow trends increase to above the 40th percentile probability. When this occurs, the flows will be high enough that water supply needs by the member governments can be met and the excess flows can be used to re-fill the reservoir.

Potable Water Use Priorities

When the Model, based upon current and/or anticipated drought conditions, calls for a reduction in water usage, the member governments will generally follow the Authority's recommended potable water use priorities listed below. However, each member government will be responsible for establishing and implementing its own list of priorities, and associated enforcement procedures, in order to achieve reductions determined to be necessary by the Authority.

The following potable water use priorities are generally recommended by the Authority:

1. Emergency facilities for essential life support measures.
2. Domestic and personal uses, including drinking, cooking, washing, sanitary and health related.
3. Farm uses.
4. Industrial uses (including those industries on public water systems).
5. Other uses such as lawn sprinkling, non-commercial car washing, garden watering, etc.
6. Outdoor recreation uses.

Implementation of Water Use Reductions

If the Authority enacts a required reduction in water use by the member governments, the Authority will notify the Georgia EPD within 7 days of deciding to implement such a specific drought management response. The Authority will provide evidence that it is following its Guidance Document and this Drought Management Policy/ Contingency Plan.

The reduction needs identified by the Model will be provided to all member governments for application within their individual systems. Each member government will be responsible for implementing the consumption reductions within 5 days notice from the Joint Committees. The protocol and methodology for achieving these reductions are included in the Drought Management Plan for each member government. These individual plans are presented as Appendix C to this document.

Enforcement of Water Use Reductions

When water use reductions are required, reductions will be based on the usage levels for each member government during the same period of the prior year plus the demand of documented new customers since the prior year period (using typical usage for each class of customer). Enforcement of water use reductions will be the responsibility of each member government. The approach for enforcement and penalties for violations are included in each member government's Drought Management Plan.

The Authority, through its management and operations staff, will notify each member government whenever water use reductions are to be implemented. Each member government will notify their customers and local media of the declaration according to procedures in their individual Drought Management Plan.

The Authority, through its management and operations staff, will notify each member government that is not meeting the water use reduction requirements and also advise all other member governments of that government's failure to comply with the Authority's requirements. The Authority will utilize a progressive enforcement procedure to facilitate compliance with water use reductions, as follows:

1. **Non-compliance for the first 30-day period after reductions are implemented.** The Authority will assess a ten (10) percent drought surcharge that will be applied to monthly volumes used in excess of the reduced usage level for the affected member government.
2. **Non-compliance for two consecutive 30-day periods after reductions are implemented.** The Authority will assess a twenty (20) percent drought surcharge that will be applied to monthly volumes used in excess of the reduced usage level for the affected member government.
3. **Non-compliance for three or more consecutive 30-day periods after reductions are implemented.** The Authority will assess a thirty (30) percent drought surcharge that will be applied to monthly volumes used in excess of the reduced usage level for the affected member government.

The Authority further reserves the right to restrict flow to any member government for non-compliance with water use reductions. This action will only occur with concurrence of the Authority Board.

Any individual member government may petition, in writing, to request a waiver of surcharges based upon extraordinary events. Examples of extraordinary events include addition of a major, water consuming industry; initiation of a contract between a member government and a wholesale customer; or protection of public health and safety. An individual member

government's request for waiver of surcharges and adjustment of water use reductions would be directed to the Chairman of the Authority. The decision on such waiver of surcharges will be made by the Authority Board.

Rationing and/or other Emergency Procedures

In the case of severe emergency conditions, the Authority may restrict water quantities (i.e. maximum day and/or average day) allowed to each of the member governments. This action will only occur with approval of the Authority Board.

Streamflow Protection

The Authority will comply with all provisions of its current withdrawal permits, including minimum instream flows, except during periods of emergency water shortage and with prior approval of the Director of Georgia EPD, as described in Georgia EPD's Rules and Regulations for Water Quality Control, Subsection 391-3-6-.07(12).

Withdrawals from the Middle Oconee River to the Bear Creek Reservoir and from the Middle Oconee and North Oconee Rivers to Athens-Clarke County will not cause streamflow levels to fall below the 7Q10 and specified nondepletable flow requirements in the current withdrawal permits, except as approved by Georgia EPD.

The gages established on the Middle Oconee and North Oconee Rivers to monitor streamflows can be accessed through the USGS website URLs (uniform resource locators):

http://waterdata.usgs.gov/ga/nwis/uv/?site_no=02217475&PARAMeter_cd=00065,00060,00062
http://waterdata.usgs.gov/ga/nwis/uv/?site_no=02217500&PARAMeter_cd=00065,00060,00062
http://waterdata.usgs.gov/ga/nwis/uv/?site_no=02217770&PARAMeter_cd=00065,00060,00062

APPENDIX A

Rules of the Department of Natural Resources
Chapter 391-3-30 Drought Management

APPENDIX B

Bear Creek Reservoir Management Guidance Document

APPENDIX C

Member Governments Drought Management Plans