

SECTION 5

Drought Management Plan

Lake Norman and Mountain Island Lake are part of the Catawba River Basin and are part of eleven hydropower impoundments in the Catawba-Wateree Project. The impoundments are owned and managed by Duke Power under license from the FERC. Lake levels are managed to provide for power generation, flood control, water supply (for CMUD), and secondarily to provide recreational opportunities. Duke Power manages the lake levels according to the “target levels” in [Table 5-1](#), which are presented as a percentage of the normal (full) pool elevation. The normal pool elevation for Lake Norman is 760 feet msl and its maximum drawdown is 15 feet. The normal pool elevation for Mountain Island Lake is 647.5 feet msl and its maximum drawdown is 10 feet. The maximum drawdown for each lake represents the minimum lake level required by Duke Power for power generation.

TABLE 5-1
Target Level for Lake Norman and Mountain Island Lake¹

Month	Target Operating Range for Lake Norman	Target Operating Range for Mountain Island Lake
January	94 - 96%	96%
February	92 - 94%	96%
March	92 - 94%	96%
April	94 - 96%	96%
May	96 - 98%	96%
June	98%	96%
July	98%	96%
August	98%	96%
September – November	97 - 98%	96%
December	96 - 97%	96%

Note:

¹ Target operating range is presented as a percentage of normal (full) pool.

Duke Power owns and manages four surface water impoundments upstream of Lake Norman and Mountain Island Lake including Lake James, Lake Rhodhiss, Lake Hickory, and Lookout Shoals Lake.

During drought conditions, Duke Power can release some storage in these upstream impoundments to ensure adequate water supply in Lake Norman and Mountain Island Lake and to maintain minimum downstream flows. This was the case during the severe drought of 1999 and 2000 when flows in the Catawba River exceeded the minimum release from Lake Wylie of 411 cfs required by Duke’s FERC license. The minimum downstream flows for the impoundments in the Duke Catawba-Wateree Project are presented in [Table 5-2](#).

TABLE 5-2
Minimum Flow Requirements for Duke's Catawba Wateree Project

Development (Reservoir)	Minimum Continuous Flow (cfs)	Minimum Average Daily Flow (cfs)
Lake James	25	66
Lake Rhodhiss	40	225
Lake Hickory	40	261
Lookout Shoals Lake	60	278
Lake Norman	80	311
Mountain Island Lake	80	314
Lake Wylie	-	411
Fishing Creek Lake	-	440
Great Falls Lake	-	444
Rocky Creek Lake	-	445
Lake Wateree	-	446

Currently, CMUD does not have an adopted drought management plan. CMUD is in the process of completing a Water Conservation Plan. Development of a drought management plan would require the cooperation of Duke Power since CMUD's water supplies are only two of eleven impoundments managed by Duke Power. Due to the complexity of the Catawba-Wateree system, Duke Power uses a reservoir operations model, a proprietary version of the commercially available CHEOPS (Computer Hydro-Electric Operations and Planning Model Software) model, to manage the lakes.

The model was calibrated specifically for the Catawba-Wateree Hydroelectric Project by Duke using detailed engineering and operations data for the project and historical flow records from available flow gauges in the basin. The Catawba-Wateree operations model accounts for inflows (streamflows) and outflows (withdrawals, generation, and indirectly, evaporation) for each reservoir in the project. The model contains detailed data for storage-area-volume relationships, reservoir elevation constraints, operating rules, turbine and generator efficiency curves, travel times and paths.

The complexity of the operation and management of the Catawba-Wateree Project do not allow for a simple monitoring of CMUD's available raw water supply capacity. Cooperation by Duke Power would be needed in order to implement an effective drought management plan.

However, CMUD has developed the Water Watch Index to provide customers with a measure of the water supply capacity. The Water Watch Index is updated daily based on water demands and the delivery capacity of the distribution system. Therefore, the index was developed to primarily to keep customers informed about water demands and the utility's capacity to deliver finished water throughout the distribution system without

adverse impacts to system pressures rather than a measure of raw water supply capacity. The Water Watch Index includes the following alert levels:

- **STABLE:** Demand for water is manageable. Thanks for your conservation
- **SERIOUS:** Water use is very high. Please minimize nonessential water use
- **CRITICAL:** Water use is too high. Eliminate nonessential water use
- **MANDATORY:** Mandatory water restrictions are in effect and will be enforced.

Water Watch Index for Friday June 22, 2001



Mandatory conservation measures could be instituted if the water supply situation becomes critical. Depending on the severity of the problem, mandatory restrictions could limit or forbid lawn watering, car washing, filling swimming pools or other specified non-essential outdoor use during certain days and times. Those who violate a City water conservation ordinance would receive a fine for each recorded event/offense. Depending on the severity of the problem, landscapers and some other businesses that rely on water may be allowed to continue operation under certain circumstances. The first and only time that mandatory conservation restrictions ever issued was in 1986.