

**Catawba-Wateree Hydro Project (FERC No. 2232)**  
**Study Plan**

**Study Plan Name:** Wateree High Water Level  
Management Study

**Study Plan Designation:** Operations 08

**Study Short Description:** Study of Lake Wateree reservoir level management by Duke Power during periods of high volume inflows as the result of high intensity precipitation events in the watershed.

**Applicable Hydro Projects/Developments:** Lake Wateree

Prerequisite Study Designation: Operations 01, Operations 02

**I. Study Objective**

The study objective is to review the management/operation of the Catawba-Wateree Project during periods of high intensity precipitation events, particularly the Lower Catawba, identify high-water concerns and evaluate alternatives and address the frequency and degree that Lake Wateree reservoir elevations rise above full reservoir elevation 225.5 ft msl.

**II. Basis**

Lake Wateree is the last of eleven (11) developments that make up the Catawba-Wateree River system. During high intensity rainfall events, especially if they occur within the watershed downstream of Lake Wylie, reservoir elevations below Wylie can rise above the full reservoir elevation. There is interest in studying operational and physical options that could be implemented at the Wateree Development or within the system to reduce the impacts, frequency, and degree of high water situations.

**III. Geographic and Temporal Scope**

The study area is primarily within the Wateree reservoir. The scope will include inflows to the reservoir from the upstream dams and analysis of the impacts to the downstream river corridor if physical or operational modifications to the existing structures were made.

**IV. Summary of Existing Data**

The period of analysis will be assessed as part of the model development and will be based on the period of historical generation records for the current river configuration after Lake Norman was completed (1964 to 2003). The study will be performed utilizing existing hydrologic and hydraulic models and the CHEOPS multiple-development reservoir/hydropower operations model, as applicable. The models incorporate Duke Power hydro plant characteristics including reservoir storage, and spillway discharge curves. The study will use available Duke hydro plant records from the flood events of 2003 and historic records for the period of 1964 to 2003 for studying frequencies of reservoir elevations. Two USGS streamflow gages for the river corridor downstream of the Wateree dam will also be used in analyzing downstream impacts of any proposed physical modifications.

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### V. Methodology

The study will be comprised of three phases. The first phase is a review of historical lake levels and determine the frequency of Lake Wateree reservoir levels above elevation 225.5 ft msl using existing Duke lake elevation data. The second phase will be an inventory and prioritization of high-water concerns, including where they occur. The third phase will be a review of operation and physical changes that could be implemented at the Wateree project. Water management through out the system is hydraulically and operationally linked, therefore, it will be necessary to use an analytical tool to analyze the impact of various operational and physical alternatives associated with analyzing lake levels at Wateree. The study will use existing hydrologic and hydraulic computer models and spreadsheets to analyze the complex interaction between inflows, outflows, and storage, for various alternatives. The need for additional field data will be determined after the initial review of results based on existing data. The scope will include analysis of the impacts to the downstream river corridor if physical or operational modifications to the existing structures were made.

### VI. Schedules and Required Conditions

Data collection and model upgrades will begin in the fall of 2003 and model/hydrology development is targeted to be completed by January of 2005.

Activity	Schedule
Obtain Digital Plant Reservoir Data From Ops 01	March 5, 2004
Perform Statistical Review of Lake Levels	May 7, 2004
Perform review of existing Structures on Wateree	August 31, 2004
Inventory and prioritize high-water concerns	August 31, 2004
Complete review of Physical and Operation Options	October 22, 2004
Prepare Report	December 31, 2004

Specific operating scenarios designed to assess the impact of physical or operational changes will be completed by July of 2005.

### VII. Use of Study Results

The results of the study will be documented in a report that will include the results of the lake level frequency analysis and a summary of the operational and physical modification alternatives investigated. Construction and life cycle maintenance costs will be estimated for implementation of the alternatives. Proposed changes in seasonal lake levels will be documented and studied with respect to impacts to recreation, fish habitat, water quality and generation using the operations model.

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**VIII. Study Participants**

	<u>Name</u>	<u>Organization</u>	<u>Phone #</u>	<u>E-Mail</u>
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**IX. List of Attachments**

If needed.

**X. List of References**

If needed.