

PREPARED FOR: Western Wake Partners

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SUBJECT: Western Wake Regional Wastewater Management Facilities
Western Wake Water Reclamation Facility
PER Technical Memorandum No. 22—Non-potable On-site Reuse

INTRODUCTION

The purpose of this technical memorandum (TM) is to describe the recommended equipment and facilities for reusing treated effluent from the proposed Western Wake Water Reclamation Facility (WRF) for non-potable water demands on the WRF site. This TM describes the preliminary design criteria, equipment selection, recommended facilities, and estimated costs to meet the process requirements.

PROCESS REQUIREMENTS

Final treated effluent will be used to serve non-potable water demands throughout the WRF site. Final treated effluent will be used for non-potable water hose bibs and water cannons used for basin cleaning, equipment washdown, and HVAC equipment process water.

At a future date, final treated effluent will be used to serve additional non-potable water demands both onsite and offsite as part of a water reclamation and reuse program. It is anticipated that these future non-potable water demands will be landscape irrigation, toilet flushing, and other uses allowed by the North Carolina Administrative Code. The current Phase 1 design will include a blind flange on the downstream side of the UV disinfection facility to expedite implementation of the future water reclamation and reuse program.

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ALTERNATIVES EVALUATION

There are two alternatives to meet the non-potable water demands of the WRF. One option is to use potable water from the Cary/Apex Water Treatment Plant (WTP). The second option is to reuse treated effluent from the WRF. Reuse of treated effluent provides several advantages, including: decreasing the quantity of nutrients discharge into the Cape Fear River, decreasing treatment process requirements for the Cary/Apex WTP, and using natural resources cost-effectively.

PROPOSED FACILITIES

Reuse water for both the Phase 1 on-site water demand, and the future off-site reuse program, will be treated effluent drawn from immediately downstream of the UV disinfection facilities. The on-site reuse equipment will consist of three pumps and a hydro-pneumatic tank. The on-site reuse facilities will be sized to provide up to 2,000 gallons per minute (gpm) with two pumps in operation.

STRUCTURES

A free-standing canopy with metal panel walls and roof will be provided to cover the pumps and hydro-pneumatic tank.

ELECTRICAL REQUIREMENTS

The on-site reuse equipment will utilize the same electrical power source as the UV disinfection equipment.

The on-site reuse system will use a programmable logic controller (PLC) at the effluent pump station for control of the pumps. The PLC will provide local access to PLC alarms, status indicators, and controls.

ESTIMATED CAPITAL COSTS

A summary of the items accounted for in the preliminary cost estimate for the Western Wake WRF on-site reuse system is shown in Table 22-1. The estimated construction costs for the reuse facilities are based on the preliminary design presented above. The total estimated construction cost for the reuse facilities, including construction contingency, engineering and construction services, and legal and financial services, is approximately \$360,000.

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TABLE 22-1
PRELIMINARY COST ESTIMATE

Hydro-pneumatic tank and pumps	\$220,000
Canopy	\$6,000
Electrical	\$45,000
<i>Subtotal</i>	<i>\$271,000</i>
Construction Contingencies	\$41,000
Engineering and Construction Services	\$31,000
Legal and Financial	\$17,000
Total Construction Cost	\$360,000
