

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. 19 – Scum Digestion Facilities

INTRODUCTION

The purpose of this technical memorandum (TM) is to describe the recommended facilities for digestion of scum collected by the skimmers from the secondary clarifiers at the proposed Western Wake Water Reclamation Facility (WRF).

PROCESS REQUIREMENTS

The processes described in this TM are the scum digester and the digested scum return pumping station. The purpose of the scum digester is to reduce the impacts of returning scum to the pretreatment facilities, to the aeration tanks, or to the aerated holding tanks. The expected source of the scum are fats/oils/greases and foam collected by the skimmer on the secondary clarifiers.

The scum digester is an aerated tank with a high freeboard to accommodate foam. The system includes a tank, an air supply, coarse bubble diffusers, and associated piping.

The digested scum return pumping station consists of a wet well equipped with submersible pumps.

ALTERNATIVES EVALUATION

Alternative strategies exist for managing scum collected at wastewater treatment plants. In general, the scum is collected from the top of clarifiers using skimmers and a scum trough. Some facilities

DRAFT

PER Technical Memorandum No.19
Scum Digestion Facilities
Western Wake Regional Wastewater Management Facilities

use equipment to reduce the volume of the scum, collect the scum in bins, and dispose of the scum in landfills. Other facilities collect the scum, reduce the volume and return the scum to either the headworks of the facility or sludge digestion facilities.

The scum digestion facilities described in this TM are modeled after the scum digester and return scum pumping facilities at the North Cary WRF and South Cary WRF. The facilities are designed to reduce the amount of foam associated with the collected scum. In addition, the scum digestion facilities are designed to provide a moderately aerobic environment for biological reactions that break down more complex compounds within the scum. The effluent from the scum digestion facilities will be returned to the pretreatment facilities or to the aerated storage tanks.

REGULATORY COMPLIANCE REQUIREMENTS

It is not the intent of the scum digester to meet any regulatory compliance requirements. Instead, the intent is to reduce the impact that fats/oils/grease and foam (collectively known as scum) has on the biological treatment process and secondary clarifier performance.

PROPOSED FACILITIES

The proposed facilities for the scum digester include a 20-ft. deep X 20-ft. long X 15-ft. wide concrete tank, a 5-hp rotary blower and a coarse bubble aeration grid. The proposed scum digestion facilities are sized based on the performance of the scum digester at the South Cary WRF (see Figure 19-1). At the South Cary WRF, the permitted treatment capacity is 12.8 mgd. The proposed capacity of the Western Wake WRF is 18 mgd, a 50 percent increase over the South Cary WRF. The scum digester at the Western Wake WRF maintains the same depth, but is 50 percent wider to provide an increased volume.

DRAFT

PER Technical Memorandum No.19
Scum Digestion Facilities
Western Wake Regional Wastewater Management Facilities



Figure 19-1: Scum Digester at South Cary WRF

Because the purpose of the scum digester is to reduce the impact of scum on the biological treatment process and the secondary clarifiers, only one scum digester is recommended. It is recommended to locate the scum digester near the secondary clarifiers. It is also recommended to place the blower in a simple block enclosure adjacent to the scum digester tank.

The digested scum return pump station is a circular concrete wet well (15-ft. deep X 6-ft. diameter) with two submersible pumps, each capable of pumping 100 gpm.

ELECTRICAL REQUIREMENTS

The electrical requirements of the scum digestion facilities included power for the blower, power for the digested scum return pumps, and power for controls and area lighting. It is recommended the motor control and starters for this equipment be included in the nearest electrical room, possibly with the return activated sludge pumps' power supply.

INSTRUMENTATION & CONTROLS

It is recommended the controls for the scum digester be incorporated into the overall facility control

system. All equipment should be capable of automatic and manual operation. Additionally, local start/stop controls should be provided for the blower and the submersible pumps.

ESTIMATED CAPITAL COSTS

The estimated cost of the equipment and facilities described in this TM are shown in Table 19-1. The cost estimate follows the guidelines established in TM 32.

TABLE 19-1
PRELIMINARY COST ESTIMATE

Digester Tank	\$114,000
Wetwell	\$20,000
Coarse Bubble Aeration and Blower	\$20,000
Pumps	\$81,000
Electrical	\$50,000
<i>Subtotal</i>	<i>\$285,000</i>
Construction Contingencies	\$42,800
Engineering and Construction Services	\$32,800
Legal and Financial	\$18,000
Total Construction Cost	\$378,600
