



Michael F. Easley, Governor
State of North Carolina

William G. Ross, Jr., Secretary
Department of Environment and Natural Resources

Alan W. Klimek, P.E., Director
Division of Water Quality

December 15, 2004

Mr. William Kreutzberger
CH2M HILL
3824 Parkway Plaza Boulevard/Suite 200
Charlotte, North Carolina 28217-1968

Subject: Speculative Effluent Limits
Proposed Western Wake Regional Wastewater Management Facilities

Dear Mr. Kreutzberger:

This letter is in response to your request for speculative effluent limits for a proposed water reclamation facility (WRF) that will serve communities in western Wake County and return reclaimed water to the Cape Fear River Basin. The proposed discharge will be located in the Cape Fear River below Buckhorn Dam. The Cape Fear River in this segment is classified as WS-V waters. This letter also serves as a response to your letter of November 29, 2004 in which you requested clarification regarding the compliance monitoring location for dissolved oxygen and other issues related to the outfall configuration.

Oxygen-Consuming Waste

The speculative limits for oxygen-consuming wastes were developed based on our review of the Cape Fear River QUAL2E Model Development and Application report prepared by CH2M HILL (April 30, 2002). This model evaluated discharge scenarios in the Cape Fear River from Buckhorn Dam to Lock and Dam #1. Based on these findings, speculative limits of 5 mg/L (summer BOD5) and 1 mg/L (summer NH3) should protect dissolved oxygen in the river.

Nutrients

As we have discussed in previous meetings, the Division has concerns about nutrient loading in this section of the Cape Fear River. Water quality data collected by the Middle Cape Fear River Basin Association indicate that the water quality standard for chlorophyll *a* is exceeded for more than 10 percent of the samples collected behind Lock & Dam #3. Therefore, the Division will likely include a portion of the Cape Fear River upstream of this structure on the 2006 303(d) list of impaired waters.

The Western Wake Regional Water Reclamation Facilities (WRF) Project Partners developed an interim nutrient management strategy for the middle Cape Fear River to address these concerns until a TMDL has been developed and implemented. An interim strategy is necessary based on the timing of various planned projects that must move forward in the absence of such an analysis. The nutrient speculative limits outlined in this letter are based on this interim nutrient management strategy and the potential changes that were discussed during a meeting on November 18, 2004. Future monitoring and modeling may indicate that more restrictive nutrient controls than those outlined in this letter are needed to protect water quality. Thus, the Division recommends that all future wastewater planning include flexibility in design to accommodate further nutrient removal requirements that may be necessary in the future.

Table 1 summarizes the speculative effluent limits for a proposed discharge of 30 MGD to the Cape Fear River from the Western Wake Regional WRF; limits for an interim flow of 18 MGD, as

requested in your letter of November 29, 2004, will be similar, but nutrient loading limits would be reduced consistent with the permitted flow. Similarly, Table 2 outlines speculative limits for the Town of Holly Springs discharge of 8 MGD to the Cape Fear River; limits for an interim flow of 6 MGD will be similar, but nutrient loading limits would be reduced consistent with the permitted flow. A complete evaluation of these limits and monitoring frequencies for both NPDES permits, in addition to monitoring requirements for metals and other toxicants, will be addressed upon receipt of a formal NPDES permit application.

TABLE 1
 Speculative Limits for Western Wake Regional Water Reclamation Facility

Effluent Characteristics	Effluent Limitation			
	Monthly Average	Weekly Average	Daily Maximum	Seasonal Average (April – October)
Flow	30 MGD			
BOD ₅ , Summer	5.0 mg/L	7.5 mg/L		
BOD ₅ , Winter	10.0 mg/L	15.0 mg/L		
TSS	30.0 mg/L	45.0 mg/L		
NH ₃ as N, Summer	1.0 mg/L	3.0 mg/L		
NH ₃ as N, Winter	2.0 mg/L	6.0 mg/L		
DO ¹			6.0 mg/L	
TRC ⁴			28 ug/L	
Fecal coliform (geometric mean)	200 /100 ml	400 /100 ml		
TP ²				500 lb/day
TN ³				1501 lb/day

¹ Compliance for DO will be measured at the WRF compliance point and evaluated as a daily average concentration

² Limit based on 2 mg/L TP. For lower flow limits, limit would be based on 2 mg/L and the lower permitted flow

³ Limit based on 6 mg/L TN. For lower flow limits, limit would be based on 6 mg/L and the lower permitted flow

⁴Limit to be applied only if chlorine is used for disinfection

TABLE 2
 Speculative Limits for Holly Springs Water Reclamation Facility

Effluent Characteristics	Effluent Limitations			
	Monthly Average	Weekly Average	Daily Maximum	Seasonal Average (April - October)
Flow	8 MGD			
BOD ₅ , Summer	5.0 mg/L	7.5 mg/L		
BOD ₅ , Winter	10.0 mg/L	15.0 mg/L		
TSS	30.0 mg/L	45.0 mg/L		
NH ₃ as N, Summer	1.0 mg/L	3.0 mg/L		
NH ₃ as N, Winter	2.0 mg/L	6.0 mg/L		
DO ¹			6.0 mg/L	
TRC ⁴			28 ug/L	
Fecal coliform (geometric mean)	200 /100 mL	400 /100 mL		
TP ²				400 lb/day
TN ³				133 lb/day

¹ Compliance for DO will be measured at the WRF compliance point and evaluated as a daily average concentration

² Limit based on 2 mg/L TP. For lower flow limits, limit would be based on 2 mg/L and the lower permitted flow

³ Limit based on 6 mg/L TN. For lower flow limits, limit would be based on 6 mg/L and the lower permitted flow

⁴ Limit to be applied only if chlorine is used for disinfection

Issues Related to Compliance Points

The compliance monitoring location for DO will be the same location as other parameters at the plant. Your letter of November 29, 2004 indicated that effluent DO is expected to remain above 5 mg/L at the discharge point based on conservative travel time assumptions and decay rates included in the QUAL2E model cited above. Specifically, you estimated a maximum decrease in D.O. of 0.8 mg/L in the pipe. Please submit the details of this analysis to the Division at your earliest convenience. The QUAL2E model indicates that the Cape Fear River is not sensitive to the effluent DO assumption, and including an effluent limit of 6 mg/L at the WRF compliance points, prior to combining the two discharges, will protect the DO water quality standard in the river.

You also point out that the Western Wake County WWTP outfall will not have a diffuser. The Division will not object to this at present, but would ask that a dye study be performed as part of the Preliminary Engineering Report so that mixing can be taken into account and dilution can be accurately calculated. Such a study would not be necessary for a diffuser design since mixing models would be employed to aid the design of such a structure. These models yield accurate dilution rates without the need for field work related to dye studies.

Please note that the Division cannot guarantee that NPDES permits for a total of 38 MGD will be issued with these speculative limits. Final decisions can only be made after the Division receives and evaluates a formal permit application for the Western Wake and Town of Holly Springs Water Reclamation Facility's proposed discharges. In accordance with the North Carolina General Statutes, the practicable wastewater treatment and disposal alternative with the least adverse impact on the environment is required to be implemented. Therefore, prior to submittal of an NPDES permit application, a detailed alternatives analysis must be prepared to assure that the requested flow is justified and an environmentally sound alternative is selected from the reasonable cost effective options. This alternatives analysis needs to be incorporated into the State Environmental Policy Act submission.

Should you have any questions about these speculative limits, please contact me at (919)733-5083, extension 517.

Sincerely,



David A. Goodrich
Supervisor, Point Source Branch

cc: Town of Cary, Kim Fisher
Town of Apex, Tim Donnelly
Town of Morrisville, Blake Mills
Town of Holly Springs, Stephanie Sudano
CDM, Tommy Esqueda
Hazen and Sawyer, Bob Berndt
Fayetteville Regional Office, Water Quality
Raleigh Regional Office, Water Quality
Modeling/TMDL Unit, Michelle Woolfolk
Coleen Sullins/Alan Klimek
Mark McIntire



Michael F. Easley, Governor

William G. Ross Jr., Secretary
North Carolina Department of Environment and Natural Resources

Alan W. Klimek, P.E. Director
Division of Water Quality

December 5, 2005

Mr. William Kreutzberger
CH2M HILL
3824 Parkway Plaza Boulevard/Suite 200
Charlotte, North Carolina 28217-1968

Subject: Correction to Speculative Effluent Limits
Proposed Western Wake Regional Wastewater Management Facilities

Dear Mr. Kreutzberger:

This letter is to provide a formal correction to an error in our letter of December 15, 2004 regarding speculative effluent limits for the subject facilities. Table 2 in that letter regarding Speculative Limits for the Holly Springs Water Reclamation Facility had an error regarding the limitations for Total Nitrogen and Total Phosphorus. While the footnote for these limitations was correct, the mass load in the table for these two parameters was reversed. The attached Table 2 includes a correction to these limits.

There were no other errors in the December 15, 2004 letter. Should you have any questions about this change, please contact me at (919)733-5083, extension 517.

Sincerely,

David A. Goodrich
Point Source Branch Chief

cc: Town of Holly Springs, Stephanie Sudano
CDM, Tommy Esqueda
Hazen and Sawyer, Bob Berndt
Fayetteville Regional Office, Surface Water Protection Section
Raleigh Regional Office, Surface Water Protection Section
Modeling/TMDL Unit, Michelle Woolfolk

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TABLE 2 (REVISED)

Speculative Limits for Holly Springs Water Reclamation Facility

Effluent Characteristics	Effluent Limitations			
	Monthly Average	Weekly Average	Daily Maximum	Seasonal Average (April - October)
Flow	8 MGD			
BOD ₅ , Summer	5.0 mg/L	7.5 mg/L		
BOD ₅ , Winter	10.0 mg/L	15.0 mg/L		
TSS	30.0 mg/L	45.0 mg/L		
NH ₃ as N, Summer	1.0 mg/L	3.0 mg/L		
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³ Limit based on 6 mg/L TN. For lower flow limits, limit would be based on 6 mg/L and the lower permitted flow

⁴Limit to be applied only if chlorine is used for disinfection