



Neuse River Watershed, North Carolina

Neuse River Compliance Association Watershed-Based Permit

Permitting Authority Contact:

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Permit Type: Watershed-based permit for co-permittees in an association

Permit Information:

<http://h2o.enr.state.nc.us/NPDES/documents/00001nrcapermit-pt1mod200401.pdf>

Pollutants of Concern in Watershed:

Nutrients (total nitrogen)

Pollutants Addressed in Permit:

Total nitrogen

Permit Issued: December 30, 2002

Modified: February 28, 2003 and January 20, 2004

Overview

The Neuse River is classified as a Nutrient Sensitive Water because of the long-term eutrofication of its estuary. In 1996, the North Carolina General Assembly passed House Bill 1339, which set a goal of reducing nitrogen loads to the estuary by 30 percent by 2003 (with 1995 as the baseline year). In 1997, the Neuse River Nutrient Sensitive Waters Management Strategy was developed to meet this goal and included a set of permanent rules (General Assembly Rules) to support implementation of the Strategy and meet the reduction goal.

EPA-approved TMDLs (1999 and 2002) established total nitrogen (TN) allocations for the Neuse River. In addition, the General Assembly's Wastewater Discharge Rule allowed point sources to form compliance associations to meet their combined requirements under the TMDL. In 2002, the North Carolina Department of Environment and Natural Resources Division of Water Quality (DWQ) issued a watershed-based permit to a group of dischargers organized as the Neuse River Compliance Association, which was formed in 2002, to regulate the discharge of total nitrogen into the Neuse River. This case study focuses on the components of the watershed-based permit issued to the Association and the group compliance mechanisms used by the co-permittees to meet the terms of the permit.

Permitting Background

The Neuse River Basin is listed as impaired because of nutrient impacts in the estuary. EPA approved Phase I of a total nitrogen TMDL for the Neuse in 1999 and Phase II in 2002. North Carolina General Assembly Rules state that the TMDL WLA (a total of 1.64 million pounds of TN at the estuary, equivalent to 3.0 million pounds of TN per year at point of discharge) was to be allocated among groups of dischargers and that the group allocation would

Watershed: Neuse River, North Carolina		
Key Water Quality Concerns: Nutrients (total nitrogen)		
Stakeholder Involvement Techniques:		
<ul style="list-style-type: none"> Group compliance approach and association internal policies to encourage involvement and compliance Coordinated research with universities Statewide basin planning approach Public notice of permit and public meetings 		
Case Study Issues of Interest		
Type of Point Sources	POTW Discharges	✓
	Industrial Process/Nonprocess Wastewater Discharges	✓
	Concentrated Animal Feeding Operations	
	Municipal Separate Storm Sewer System Discharges	
	Construction Site Stormwater Discharges	
	Industrial Facility Stormwater Discharges	
Highlighted Approach(es)	Combined Sewer Overflows	
	Statewide Watershed Approach	
	Implementation of Water Quality Standards	
	Implementation of Total Maximum Daily Loads or Other Watershed Pollutant Reduction Goals	✓
	Permit Coordination/Synchronization	
	Integrated Municipal Requirements	
	Point Source – Point Source Water Quality Trading	✓
	Point Source – Nonpoint Source Water Quality Trading	✓
Discharger Association	✓	
Coordinated Watershed Monitoring		

be further divided into individual discharger allocations based on permitted flows. In this manner, the TMDL WLA was divided among the 110 existing nitrogen-discharging facilities as an annual mass loading limitation and incorporated into NPDES permits as of January 1, 2003.

The Wastewater Discharge Rule (Rule T15 NCAC 2B.0234), establishes specific nutrient control requirements for point source dischargers in the watershed and includes a provision which allows point sources to form a compliance association to work collectively to meet the combined total nitrogen WLA of 1.64 million pounds of total nitrogen per year at the estuary.

The Neuse River Compliance Association (Association) was formed in 2002 as a non-profit corporation. As of January 2005, it included 21 members responsible for 25 private and public TN dischargers in the Neuse River watershed. Many of its members also belong to the Lower Neuse River Association, a monitoring coalition in the watershed, and so already had a history of cooperation. The Association applied for a watershed-based group compliance permit to regulate the discharge of total nitrogen from all of its member facilities on June 28, 2002. The permit (NCC000001) was issued on December 30, 2002 and has been modified annually since then to reflect changes in membership.

Permit Strategy

The Association group permit is based on the General Assembly Rules that implement the Neuse River Nutrient Sensitive Waters Management Strategy. These implementation rules establish how nitrogen loads are allocated among dischargers and provide for a group compliance approach. The permitting strategy for the Neuse River involves implementing this application approach and group compliance option as described below.

TN delivery to the estuary varies with the point of discharge; therefore, the watershed was divided into four transport zones – 10, 50, 70 and 100 percent delivery. The point of discharge allocations established in the Neuse

River TMDL and the equivalent estuary allocations are as follows:

- ◆ Existing dischargers with permitted flows greater than or equal to 0.5 million gallons per day (MGD) (500,000 gallons per day) downstream of Falls Lake dam have a combined limit of 2.45 million pounds of TN per year at point of discharge (1.51 million pounds of TN per year at the estuary).
- ◆ Existing dischargers with permitted flows greater than or equal to 0.5 MGD upstream of the dam have a combined limit of 444,000 pounds of TN per year at point of discharge (44,368 pounds of TN per year at the estuary).

- ◆ Existing dischargers with permitted flows less than 0.5 MGD have a combined limit of 138,000 pounds of TN per year at point of discharge (83,591 pounds of TN per year at the estuary).

A new or expanding facility must purchase an adequate nitrogen allocation from an existing discharger or make an offset payment to the Wetland Restoration Fund equivalent to twice the standard offset rate required (\$22/lb) to pay for nonpoint source controls necessary to remove the increased nitrogen loading. The discharge limit for new or expanding dischargers cannot exceed the mass equivalent of 3.5 mg/L TN for municipal dischargers and 3.2 mg/L for industrial dischargers. This requirement is intended to ensure application of best available technology for new and existing dischargers. The DWQ can also set more stringent limits to protect the river and its tributaries from any local water quality impacts.

Dischargers with permitted flows greater than 0.5 MGD are subject to TN limits either in their individual permit or in a group permit and can meet these requirements in one of two ways—individually or by joining a trading coalition and being covered under a watershed-based group compliance permit. If a discharger chooses to meet the requirement individually, the TN limit is the same fraction of the group's total allocation (2.45 million or 440,000 pounds of nitrogen per year at point of discharge, depending on the location) as the discharger's permitted flow is of the group's total flow. If a discharger chooses to join a nitrogen trading coalition, the facility would be covered under a group compliance permit and the coalition would be required to collectively meet the combined TN limit of all members. Dischargers below the 0.5 MGD threshold may also join a trading coalition and would be required to meet the collective limit even though they do not have existing nitrogen limits in their NPDES permits.

Where a trading coalition (group compliance) option is chosen, individual limits still apply, but the facilities are deemed "in compliance" with individual limits as long as the group remains in compliance with the combined limit. If the group exceeds the combined TN limit, then the group must make an offset payment to the Wetland Restoration Fund and any facility which has exceeded its *individual* TN limit is in violation as well.

Permit Highlights

The Association's group permit was the first watershed-based group compliance permit issued under the Wastewater Discharge Rule. Each of the co-permittees had existing NPDES permits with TN effluent limitations and requirements.

The group permit was issued as a supplement to the dischargers' existing NPDES permits. The group compliance permit regulates the combined discharge of TN from all covered facilities using a group effluent limit, but does not replace other individual permit requirements. The require-

ments under each individual permit remain in effect for other parameters.

The combined TN allocation for all Association members covered by the group compliance permit is 1,137,171 pounds TN/year at the estuary.

Permit Components

Effluent limits

Part I, Section A.(3.) of the permit describes the method for determining the Association’s group estuary allocation and each co-permittee’s individual estuary allocation. Appendix A of the Association’s permit contains the list of co-permittees covered (members of the Association), the discharge allocation (i.e., allocation at the point of discharge) and the equivalent estuary allocation (i.e., allocation at the estuary) for each member. Appendix A also lists the transport factor for each facility which is used to convert between the discharge allocation and the estuary allocation. The transport factors are the fraction of the TN in a facility’s discharge that is expected to reach the estuary. The transport factors applied are taken from the allocation method described in the Wastewater Discharge Rule

The TN allocations are annual mass limits established on January 1 of each year. They are reevaluated annually and

Town of Apex, Middle Creek Wastewater Treatment Plant TN Allocations

Discharge Allocation (DA) = 40,547 pounds/year
 Transport Factor (TF) = 50%
 Estuary Allocation (EA) = 20,274 pounds/year
 Where, $DA(TF) = EA$

are revised if needed. As noted above, the current estuary TN allocation for the Association is 1,137,171 pounds TN/year (1.137 million pounds TN/year).

Facilities are responsible for complying with the estuary allocations in the permit rather than the discharge allocations. An individual facility is in compliance with its estuary allocation if one of two conditions is met:

- 1) The Association’s estuary load complies with the Association’s estuary allocation (which is the combined total of the individual estuary allocations for all members) or,
- 2) In the event that the Association estuary load exceeds the Association’s estuary allocation, the individual

facility’s estuary load does not exceed that individual facility’s estuary allocation.

The current permit (modified December 29, 2005) establishes estuary allocations for 21 co-permittees and 25 facilities. If a co-permittee terminates membership in the NRCA, the member is no longer covered by the group compliance permit and is then subject to the TN limits included in its existing individual NPDES permit. In addition, the allocations of co-permittees can change as a result of purchases, sales, trades, leases, etc., however, these changes must be recognized in the individual permit and reflected in the permit limits before being incorporated into the Association’s permit.

Monitoring and Reporting Requirements

The group compliance permit does not contain any monitoring requirements. Each member is required to monitor under its existing individual NPDES permit. The group compliance permit requires that the NRCA compile all monitoring results obtained by each member to submit in the mid-year and annual reports.

Each facility’s individual NPDES permit requires that they submit discharge monitoring reports (DMRs) and the group compliance permit does not duplicate that requirement. However, annual, mid-year, and 5-year reports are required of the Association.

Annual reports are required to provide the State with a report on compliance and program status. The permit requires that the annual report include, at a minimum:

- Summary of DMRs that outline each co-permittee’s discharge and estuary TN loads as well as the Association’s group estuary TN load;
- Summary of change in membership;
- Summary of allocation transactions affecting allocations of the NRCA or its members;
- Description of the Association’s TN control strategy for the previous year and any changes upcoming year;
- Detailed description of measures taken to control TN discharges;
- Assessment of progress made; and
- Description of efforts planned for upcoming year.

All changes in roster or allocations are made through a minor permit modification procedure and the state must be notified of any changes in a mid-year report (Part I, Section A.(2.) of the permit). The 5-year report must be submitted to verify that the individual and group allocations are appropriate and adequate.

Compliance Conditions

Part I Section A.(6.) of the permit details compliance conditions for the co-permittees. The Association is required to pay \$11/lb for each pound the group estuary allocation is exceeded. In addition, the DWQ may take enforcement action against the NRCA for an exceedance. If the Association exceeds its allocation, any facility which exceeded its individual estuary allocation will also be in violation of the group compliance permit. The permit also states that “No Co-permittee Member shall be liable for any other Co-Permittee Member’s non-compliance with this permit” (section A.(6.)(e.)).

The NRCA requires members to pay a fee for individual exceedances of their limits on a graduated scale during

Offset payments to the Wetland Restoration Fund are required when the NRCA exceeds the group TN limit established in the permit. The payment rate is \$11/lb TN. This offset capability was established in the Wastewater Discharge Rule.

2004–2008. This funding is to pay for any offsets necessary due to group limit exceedances or to pay for improve treatment technologies at individual facilities.

Neuse River Point Source Dischargers

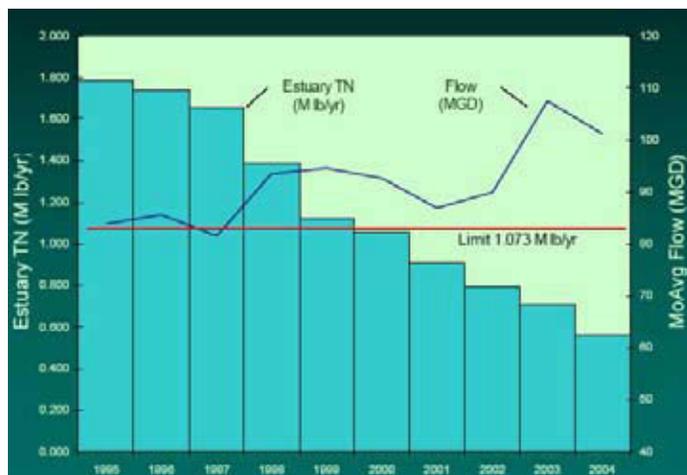
Appendix B of the Association’s permit lists all facilities in the Neuse River basin holding an individual NPDES permit (as of 1995). These facilities are assigned a portion of the TN WLA under the Neuse River Basin Nutrient Sensitive Water Management Strategy (confirmed by the TMDL approved in 1999). Appendix B lists the transport factors that apply to each facility’s discharge. The total estuary allocation of 1.64 million pounds of TN/year is divided among the existing point source dischargers.

Permit Effectiveness

Environmental Benefits

Since 1995, the NRCA members have achieved a 69% reduction of TN loading at estuary. In addition, the combined estuary loading was approximately 50 percent of the allocation in 2004.

Figure 1. NRCA Performance 1999–2004



(NCDWQ 2005)

Benefits to the Permittee

According to the Executive Director of the NRCA, the group compliance approach allowed the larger municipalities to assist the smaller municipalities that did not have the resources or the ability to make capital improvements to their plant quickly. The collective limit has allowed the larger dischargers to make necessary improvements, reducing their nitrogen loadings to accomplish the necessary reductions and providing a cushion in the form of excess allocation for use by the smaller dischargers until they can make necessary improvements. This allows the smaller dischargers time to assess their plants and develop cost effective ways to reduce their nitrogen loadings. As time goes on, however, the smaller dischargers will be under pressure from the larger facilities to make necessary improvements to add to the success of the group approach.

Other members have joined the group specifically to lease nitrogen to improve a noncompliant situation. In these cases, the group provides experienced operators to help them optimize their plant processes and reduce nitrogen loadings far below what they had previously achieved (even without construction.)

In addition, the group “polices” members, to avoid unwanted negative publicity or state scrutiny. The NRCA has an internal enforcement policy where members pay an assessment if they exceed their own individual allocation. These assessments are held in escrow until such time that the plant is compliant, when the member can receive 80% of the assessment to pay for plant improvements. These assessments can escalate to provide further incentive for the member to comply.

Further, the members of the NRCA share information at meetings and through association communications. The

collective wisdom and experience of the group is priceless in a time when technology and regulations can change rapidly. The group enjoys the collective bargaining power of any professional organization, in lobbying for legislation, regulations and resolution of permitting issues. With nitrogen allocations fast becoming a major issue in limiting growth, the group has been able to negotiate with the state for additional consideration in requesting additional flow for member plants. The group has been able to document that many facilities are able to treat well below the BAT (Best Available Technology) limits used by the state for total nitrogen. This collected has been effective in presenting growth issues to the permitting authority.

Finally, the group has a monitoring component that provides consistent monthly data to the state on the entire lower Neuse Basin. The group has just recently engaged in coordinated research with the University of North Carolina to provide funding to monitor the Neuse River and the estuary. In addition, the group has contracted with North Carolina State University to conduct research into appropriate nutrient offset projects that could be done by members and the costs associated with these projects.

Benefits to the Permitting Authority

According to the NCDWQ contact, Mike Templeton, the Association's watershed-based permit has provided an opportunity for dischargers to work collaboratively and communicate more effectively to meet broad water quality goals. This has been accomplished without substantial oversight by NCDWQ.

In addition, the Neuse group permitting approach now being applied in Jordan Reservoir watershed Reservoir watershed. A TMDL has been submitted and rulemaking has begun.

Lessons Learned

The NRCA Executive Director, Ms. Cynthia Finan, was asked several questions about "lessons learned" from the Neuse River Compliance Association group permitting effort.

What have been the most challenging parts of the project?

- 1) **Public relations issues.** *There have been some truly significant improvements in point source TN loadings (69% reduction over 1995 loadings), but the Association is constantly under scrutiny from the outside (e.g., media and environmental groups) and remains subject to criticism. The media does not understand trading, and environmental groups would like to see all removal of loadings be permanent. Also, although nonpoint sources contribute significantly more loading (80%) than point sources, nonpoint sources get little attention.*

- 2) **Equity in nitrogen allocation.** *The original allocations included in the TMDL were based on the permits that were held by the dischargers at that time. Some dischargers received larger allocations their permits provided for much more excess flow than others.*
- 3) **Setting up trading mechanisms.** *The state regulatory agency and the association are creating this system as we go along. There was little actual framework for trades and leases at the time the association was formed. We are working through these issues as these transactions occur. This leads to concern among members that acquired allocations may not be permanently acknowledged which tends to discourage trading.*
- 4) **Lack of incentives for performance.** *There is no reward for the facilities that have complied and have installed the best available technology. While they have an excess allocation, it is enjoyed by the whole group and they do not receive any incentive for maintaining that level of treatment, unless another member pays to lease or buy nitrogen from them.*
- 5) **Compliance assessed annually.** *The state regulatory agency wants any trade, sale or lease agreements to be negotiated at least 6 months in advance of the annual modification of the permit. Members cannot possibly know how much TN they will need to lease or trade that far in advance.*
- 6) **Educating the elected officials from member cities.** *The concept of a compliance association and nutrient trading requires quite a bit of understanding of the regulatory framework and the technical aspects of the permit. The delegates on our board must keep their elected decision-makers apprised of what the association is and the benefits of membership.*
- 7) **Allowing for growth.** *Ultimately, the biggest challenge facing this association is how to allow for growth in the watershed. Point source trading will not solve this problem and the current system for buying additional nitrogen from the wetland restoration fund (EEP-Ecosystem Enhancement Program) is cost-prohibitive. Point source to nonpoint source trading might help this problem to some extent.*

What could have been done differently to resolve the challenges more easily?

- 1) *In North Carolina, compliance with the permit is assessed on an annual basis. Other programs*

have established trading programs where trading is allowed on a month to month basis. This makes it easy for a member to make a withdrawal from “the bank” when nitrogen is needed. Trades in NC are more cumbersome due to the fact that they must be permanent or “leased” on an annual basis.

- 2) More detail regarding the procedures and implementation mechanisms should be determined up front.
- 3) Allow point source to non-point source trading in the basin.
- 4) Limit membership in the association to eliminate the effects of local water quality impacts from trades. We have one member that is above a dam and discharges into a major lake in the watershed. Water quality issues make trading in this type of situation difficult, and have caused considerable repercussions.

- Would this approach be applicable to other watersheds? What characteristics would define other candidate watersheds?

There needs to be a TMDL to drive the need for membership. The group needs to have an altruistic attitude and must truly want to do what is best for the watershed. Diversity among the members seemed

to have helped our group, with the larger dischargers having a desire to help the smaller dischargers who did not have the resources to add TN removal immediately. And, it might be wise to make sure that the membership of the group shares a geographical area that makes sense for trading and eliminates local water quality impacts that may require different limits than those given under the TMDL.

- If the approach were to be applied in another area, what changes should be made?
 - 1) Shorter term trading with an easy mechanism for reporting to the regulatory agency, as is used in other programs.
 - 2) Some reward for compliant members who treat below best available technology limits.
 - 3) Limitations on membership based on water quality concerns and geographical limitations that will affect trades.

Mike Templeton added that NCDWQ has determined that trades and other changes must be established in the affected individual permits before being reflected in the group permit. This approach will ensure that the facility has addressed all individual permit requirements necessary for the trade or change (e.g. plant improvements) before the group permit is revised. If all individual permit requirements are met, then the group permit can be changed using a minor modification.

Resources

North Carolina Division of Water Quality. 2004. Fact Sheet: Neuse River Compliance Association, NCC000001. <http://h2o.enr.state.nc.us/NPDES/documents/00001nrcafactsheet-2002permit.pdf>

North Carolina Division of Water Quality. Permit No. NCC000001, issued to the Neuse River Compliance Association and Its Co-Permittee Members. Issued on December 30, 2002. <http://h2o.enr.state.nc.us/NPDES/documents/00001nrcapermit-pt1mod200401.pdf>

North Carolina Division of Water Quality. 2005. Presentation given to the Virginia Department of Environmental Quality's VPDES Technical Advisory Committee. Presented by Mike Templeton. August 31, 2005. Richmond, Virginia.

Note: All Web references current as of July 6, 2007.