

Maryland Department of the Environment

Biological Nutrient Removal (BNR) Upgrade for Minor Facilities

Introduction

On May 26, 2004, Governor Ehrlich signed Senate Bill 320 (Bay Restoration Fund) into law. The purpose of the bill is to create a dedicated fund financed by citizens and businesses to upgrade Maryland wastewater treatment plants with enhanced nutrient removal (ENR) facilities. ENR facilities with a design capacity of 0.5 million gallons per day (MGD) or more will be capable of achieving wastewater effluent quality of 3 mg/l in total nitrogen and 0.3 mg/l in total phosphorus. Minor facilities, of less than 0.5 MGD, are not initially targeted for ENR upgrade. Also, these facilities have not received any funding under the BNR program.

Failure to address minor facilities may offset the advances made under the Bay Restoration Fund. Most minor facilities are currently achieving the secondary treatment level of approximately 18 mg/l total nitrogen. Some of these minor facilities (more than 0.11 MGD flow) will be discharging more pounds of nitrogen per year than major facilities that have an average flow of 0.5 MGD and are upgraded to the ENR level of treatment to achieve annual nitrogen loading of 6,100 pounds per year. This is one of the challenges discussed by the Bay Restoration Fund Advisory Committee Annual Status Report (January 2006) to the Governor, the Senate Education, Health, and Environmental Affairs Committee, and the House Environmental Matters Committee.

The Bay Restoration Fund Act indicates “*A wastewater facility that has not been offered or has not received funds from the Department under this section or from any other fund in the Department may not be required to upgrade to enhanced nutrient removal levels, except as otherwise required under federal or state law.*” In consideration of this and other factors, the Department may have some difficulties requiring minor facilities to upgrade without offering any funds, unless the upgrade is required by the Total Maximum Daily Loading (TMDL) and/or local water quality standard.

Therefore, the Department would like to use the following policies and procedures to allow the use of the State BNR grants to upgrade wastewater treatment plants with or expanding to a design capacity of 0.11 or more to maintain the nitrogen loading at 6,100 Lbs per year and phosphorus at 460 Lbs per year.

A. Project Selection:

MDE will annually solicit and select projects based on a priority system and available annual capital budget to upgrade publicly owned facilities discharging to the Chesapeake Bay with or expanding design capacity of 0.11 or more to maintain the nitrogen loading at 6,100 Lbs per year and phosphorus at 460 Lbs per year.

MDE will consider for funding only projects that are:

- 1) Consistent with the County Water and Sewer Plans.
AND
- 2) Support growth only within the State designated Priority Funding Area (PFA), or if there is a demonstrated public health necessity documented as part of the application for funding.

In addition to the Integrated Priority System currently used by MDE the projects need to be rated, ranked, and prioritized based on the following:

I. The Cost-effectiveness in Providing Water Quality Benefits:

Unit Cost (\$/Lb Removed)	Points
Low (< \$30)	20
Moderate (between \$30 and \$60)	15
High (> \$60)	5

II. The Water Quality Benefit to Impaired Wart

Points will be given based the water quality benefit to a body of water identified by MDE as impaired under section 303(D) of the Clean Water Act.

TMDL Status	Points
EPA approved TMDL	20
MDE TMDL list	15
Other	5

III. The Readiness to Proceed to Construction:

Status	Points
Construction will start within 6 months	20
Construction will start within 6 to 17 months	15
Construction will start within 18 to 24 months	10
More than 24 months to construction	5

IV. The Nitrogen and Phosphorus Load Reduction:

Load Reduction (Lbs/Year)	Points
More than 5,600	20
Between 5,600 and 2,800	15
Less than 2,800 but more than 1,000	10
Less than 1,000	5

V. Compliance Assistance:

Points should be assigned for projects that would assist plant be in compliance or prevent potential future violations.

Compliance Status	Points
Project will assist correct an existing violation with an active consent order	20
Project will assist correct an existing violation with a consent order being negotiated.	15
Project will assist correct a reported minor violation that, if it continued or become major, it may lead to a consent order	10
Applicant demonstrated that the project will assist in preventing a potential future violation	5

B. Level of Funding:

Up to 50% of eligible and needed BNR cost to maintain the nitrogen loading at 6,100 Lbs per year and phosphorus at 460 Lbs per year. Grants can be provided for the planning, design and construction of needed BNR facilities for flows up to the existing design capacity.

A project schedule will be negotiated as part of the BNR agreement between MDE and the grant recipient. If the project construction start is delayed by more than 12 months from the negotiated schedule, the project will be removed from funding list and the applicant will be required to re-apply for funding to receive further consideration.

Additional Assistance for Small, Low Income Communities:

Contingent upon the availability of funds, an Additional 25% of the eligible and adjusted BNR cost can be provided using State Supplemental Grants for small, low-income communities that meet the following criteria:

1. The community will continue to be small after the proposed expansion, and population will continue to be below 10,000. Hence, projects that would include an expansion to 1 million gallons per day or more would not qualify for this supplemental funding.

AND

2. The community’s median household income is lower than the overall county median household income where the community is located.

C. BNR Grants Eligibility Determination:

MDE will identify the eligible ENR components for each specific project in consultation with the grantees and their consultant engineers. The following items are usually eligible for BNR grants participation:

Process	% BNR Eligible Before Expansion Adjustment
Headwork/Grit Removal	50% Eligible only if these components are not included in the existing facility.
Primary Clarifier	0%
Secondary Clarifier	100%
Sludge	50% if the process is changed to activated sludge due to the BNR project
Phosphorus Removal	100% of the process to achieve the needed concentration that would yield 460 Lbs per year.
Nitrogen Removal	100% of the process to achieve the needed concentration that would yield 6,100 Lbs per year.
Conventional or Denitrification filter	100% if it is needed for the concentration that would achieve the required load.
Disinfection/Post Aeration	0%
Common items such as site work, yard piping, engineering services, etc.	Prorated based on Eligible/Total

Expansion Adjustment:

BNR participation is limited to the existing design capacity. After determining the eligibility based on the above items, the total eligible amount is adjusted to disallow the expansion cost using the following:

If the purpose of the expansion is to accommodate existing public health and/or special water quality needs, infill development within an existing community, or reasonable growth within 20% of current capacity:

$$\text{Adjusted Eligible Cost} = \left[\frac{\text{Existing Design Capacity}}{\text{Expanded Capacity}} \right]^{0.62} \times (\text{Eligible Cost from Items})$$

If none of the above conditions exist:

$$\text{Adjusted Eligible Cost} = \left[\frac{\text{Existing Design Capacity}}{\text{Expanded Capacity}} \right] \times (\text{Eligible Cost from Items})$$

– Expanded Capacity –

D. Financial Assistance/Budget Appropriation:

A separate funding list will be established for BNR upgrades for minor facilities.

E. Clearinghouse/Growth Management Review:

Unless state revolving loan funds or federal grant is provided, WQIP will follow the same procedures currently used for state grants.

F. BNR Agreement:

The current model BNR agreement will be modified and used for minor facilities.

BNR agreements between MDE and the facilities being upgraded will include the following additional item: The owner of a wastewater facility “shall operate the biological nutrient removal facility year-round in a manner that optimizes the nutrient removal capability of the facility in order to achieve _____ mg/l total nitrogen and _____ mg/l total phosphorus performance levels.” The concentrations will be determined based on the required loading.

G. Other Established Procedures:

WQIP will follow its current SOPP procedures for design review, procurement, construction monitoring, payment processing, final inspection, project closeout, and other project management and administrative functions currently described in the SOPP for State Revolving Loan Funds.