Nitrogen Requirements for NPDES Permits in the Long Island Sound Watershed

June 7, 2019

Presentation Overview

- Long Island Sound (LIS) and the LIS TMDL
- Permitting actions to date
- New approach for implementing the TMDL through NPDES permits
- Anticipated timeline for issuing permits
- Potential funding sources
- Technical assistance

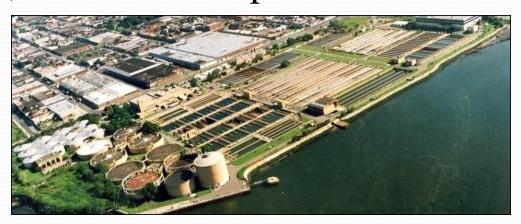
Long Island Sound (LIS)

- LIS unable to meet WQS for dissolved oxygen, due to excess nitrogen loading
- CT and NY developed DO TMDL in 2000
 - Approved by EPA in 2001
 - Focuses on reduction in nitrogen loading to achieve DO standards in the Sound



LIS TMDL Allocations

- CT and NY: 58.5 % reduction, 10% from nonpoint sources and remainder from point sources (primarily WWTPs)
- Upper basin* (MA, NH, VT): 25% from point sources, 10% from nonpoint sources



*Upper basin referred to as "out-of-basin" in LIS TMDL

Progress Under LIS TMDL

- CT point source reduction target met through statewide nitrogen trading program
- NY met point source reductions through treatment plant upgrades
- Upper basin states have met aggregate nitrogen reduction goal
- Current and planned actions by states expected to fall short of LIS TMDL goals
 - Dissolved oxygen standards are not being met in LIS

LIS Nitrogen Reduction Strategy

- Separate and ongoing effort conducted by EPA <u>not</u> related to this new approach to implementing the LIS TMDL
- Recognizes more work may need to be done, particularly in coastal embayments and estuarine portions of rivers that flow into LIS
- EPA working to establish nitrogen thresholds for several coastal embayments
- Possibility of more stringent effluent limits in the future
- For more information, see http://longislandsoundstudy.net/issues-actions/water-quality/nitrogen-strategy/

NPDES Permitting in Upper Basin to Date

- Evaluation of current and/or alternative methods of operating facility to optimize nitrogen removal
- Annual report documenting efforts to optimize nitrogen removal, annual nitrogen load from facility, and trends relative to previous year
- Non-enforceable nitrogen loading "cap"/"benchmark"
- Weekly, monthly, or quarterly effluent nitrogen monitoring



Estimated Upper Basin Point Source Nitrogen Loadings to Connecticut, Housatonic, and Thames Watersheds

Basin	1998 Baseline Loading (lb/day)	TMDL WLA (lb/day)	Max Loading 2013- 2017 (lb/day)
Connecticut River	21,672	16,254	14,395
Housatonic River	3,286	2,464	1,628
Thames River	1,253	939	666
Total	26,211	19,657	16,689

Need for new approach

- Optimization requirements have resulted in nitrogen reductions, but not enforceable
- Some current caps/benchmarks result in very low concentrations at design flow
- Cannot prevent increases in nitrogen loads from population growth or new industrial sources
- LIS still impaired for dissolved oxygen
- Concerns raised by the state of Connecticut and citizens about potential for increased loading
- Enforceable limits will ensure that new growth in communities does not result in increased nitrogen loads that further degrade LIS

New approach for nitrogen permit requirements in Massachusetts

- Enforceable nitrogen limits for wastewater treatment plants (WWTPs)* with design flow 1 MGD or greater
- Rolling annual average mass-based loading limit (in lb/day)
- Optimization requirement for all WWTPs and industrial facilities with design flow 0.1 MGD or greater
- Monitoring only for all WWTPs and industrial facilities with design flow < 0.1 MGD

WWTPs = Publicly and privately owned treatment works

WWTPs ≥ 1 MGD

Rolling Annual Average Mass-based Loading Limit (lb/day) + optimization

- Facilities ≥ 50 MGD
 - 2,591.4 lb/day
- Facilities ≥ 10 MGD and < 50 MGD
 - Limit equivalent to 5 mg/L at design flow
- Facilities ≥ 5 MGD and < 10 MGD
 - Limit equivalent to 8 mg/L at design flow
- Facilities ≥ 1 MGD and < 5 MGD
 - Limit equivalent to 10 mg/L at design flow

WWTPs ≥ 1 MGD Examples

- Chicopee (Design Flow = 15.5 MGD)
 - Limit = 15.5 MGD x 5 mg/L x 8.345 = 646.7 lb/day
- Amherst (Design Flow = 7.1 MGD)
 - Limit = 7.1 MGD x 8 mg/L x 8.345 = 474.0 lb/day
- Great Barrington (Design Flow = 3.2 MGD)
 - Limit = 3.2 MGD x 10 mg/L x 8.345 = 267.0 lb/day

WWTPs < 1 MGD

- Facilities ≥ 0.1 MGD and < 1 MGD
 - Optimize with no limits, monitor
 - Example: North Brookfield (0.76 MGD)
- Facilities < 0.1 MGD
 - Monitor only
 - Example: Charlemont (0.05 MGD)

Industrial Facilities

- Facilities ≥ 0.1 MGD and < 1 MGD
 - Optimize with no limits, monitor
 - Example: Chang Farm (Expected maximum flow 0.65 MGD)
- Facilities < 0.1 MGD
 - Monitor only
 - Example: Solutia Chemical (expected maximum flow o.o15 MGD)

Anticipated Timeline for WWTP Permits

- Great Barrington, Lee, Lenox
 - Drafts to be public noticed in next week or two
- Chicopee, Gardner, Pittsfield
 - Public Notice Fall 2019
- Millers River Permits
 - Templeton, Orange, Athol, Erving POTW 1, Erving Center WWTP 2, Winchendon
 - 2020
- WWTP General Permit
 - 2020

Potential Funding Sources

- MassDEP State Revolving Fund Loans
 - Standard low interest loans (2 %)
 - Nutrient reduction projects may be eligible for o% loans (special conditions apply)
 - Solicitation of proposals each June, proposals due in August
- Long Island Sound Futures Fund
 - Grant funding
 - Cannot be used to meet permit requirements; could be used prior to permit issuance
 - 2019 proposals due in May, look out for 2020 funding

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Resources

- NEIWPCC Report Low Cost Retrofits for Nitrogen Removal at Wastewater Treatment Plants in the Upper LIS Watershed:
 - http://click.neiwpcc.org/neiwpcc_docs/LIS%2oLow% 2oCost%2oRetrofit%2oFinal%2oReport%2o-%2oMarch%2o2015%2o(revised).pdf
- EPA Report Case Studies on Implementing Low-Cost Modifications to Improve Nutrient Reduction at WWTPs: https://www.epa.gov/nutrient-policy-data/case-studies-implementing-low-cost-modifications-improve-nutrient-reduction

Questions?

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