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Connecticut River's Nitrogen Reduction Dilemma Demands a New Dynamic with Regulatory Partners

By Jaimye Bartak

The four-hundred-mile Connecticut River in New England was once dubbed “the world’s most beautifully landscaped cesspool”—a reputation that naturally carried over into the Long Island Sound, the tidal estuary into which the river flows.

That perception, that reality, no longer holds water today.

For decades, the successful rehabilitation of the nation’s waterways—like our Connecticut River—relied on the leadership of regulatory agencies in providing the scientific underpinnings of water quality regulations. And equally as important in this process, the clean water community provided valuable input during implementation, ultimately providing the technical know-how and innovation to realize regulatory goals, from treatment plant upgrades and process innovations to CSO remediation. This relationship, this collaborative

partnership, could not and cannot be emphasized enough. Today, the positive results of that relationship are evident across the country, as a great many Americans are now able to venture into their once-contaminated rivers and harbors once again—beautifully landscaped cesspool labels notwithstanding.



UNAVOIDABLE ROLE REVERSAL

But recently, the dynamic between regulators and the clean water community along the Connecticut has shifted uneasily. Despite the US Environmental Protection Agency’s (EPA’s) own reporting that the existing nitrogen total maximum daily load (TMDL) for the Long Island Sound (LIS) is being met, restrictive numeric nitrogen limits are now being incorporated into draft National Pollutant Discharge Elimination System (NPDES) permits for plants in the “out-of-basin” contributor area of Massachusetts and points north. This has led to a role reversal of sorts between utilities and regulators.

In the 1980s and 1990s, LIS experienced episodes of hypoxia in its open waters. A TMDL was developed and issued in 2000 for the “in-basin” states of New York and Connecticut, calling for a 58.5% reduction of in-basin nitrogen sources and a 25% reduction of out-of-basin nitrogen sources. In response, 106 wastewater treatment facilities in Connecticut and New York adopted nitrogen-reduction technology costing billions, and resulted in a 40% reduction in hypoxic area in LIS by 2014. But 40% is not 100%.

To address the remaining hypoxia, the EPA initiated the LIS Nitrogen Reduction Strategy (NRS) in 2015 as part of its larger LIS Study—a wide-ranging initiative established in 1985 in partnership among federal, state, and citizen stakeholders in Connecticut and New York. The EPA contends that the LIS NRS, which will develop total nitrogen endpoints based on indicator species (e.g., eelgrass) in embayments, is “intended as a source of relevant information to be used by water quality managers, at their discretion, in developing nitrogen reduction strategies.” However, utilities and NACWA are concerned that the EPA intends to develop water quality targets that will be considered numeric interpretations of state narrative criteria, without any of the procedural protections provided when numeric standards are traditionally developed.

QUESTIONING THE PREMISES

The expected and typical process to create new numeric limits would be to formally update the TMDL. Instead, the LIS NRS would essentially layer in additional limits. Particularly concerning in this effort is the EPA’s reliance in shaping environmental policy on data that span decades and were collected under a multitude of differing quality assurance project plans (QAPPs) by different agencies and organizations. Virtually no new data have been collected as part of the LIS NRS to inform decision-making on the Connecticut River or its embayment.

To illustrate how this approach could play out, consider the experience of the Springfield Water and Sewer Commission (SWSC), which operates a 67 million-gallon-per-day (MGD) capacity treatment plant on the southern border of Massachusetts. In 1995, SWSC voluntarily invested in nitrogen reduction technology, substantially reducing nitrogen effluent concentrations in the 40 MGD it processes.

SWSC’s current NPDES permit—dating from 2000, the same year as the TMDL—does not address nitrogen, nor were nitrogen load allocations ever developed for states north of Connecticut, a situation brought about precisely because the EPA concluded in 2004 that the out-of-basin TMDL was being met. But SWSC’s first NPDES permit draft update in 17 years now includes nitrogen limits that will require significant upgrades to the treatment plant and may effectively limit the ability of SWSC to add additional communities to its system, impacting regional development. The 32 other smaller plants in Massachusetts that are on tributaries to the Connecticut River may face even steeper challenges.

Yet, on what data are these new nitrogen limits based? Are they assured to bring that 40%



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hypoxia reduction much closer to 100%? Is the science strong enough to link the condition of eelgrass in embayments to that of the open waters of the LIS?

Currently, the fate of nitrogen entering the Connecticut River is understood only through that patchwork collection of statistically insignificant and outdated data points. This raises significant alarm that clean water plants in Massachusetts and points north may be required to invest in substantial nitrogen reduction technology without a basic scientific foundation to ensure meaningful environmental improvement in the LIS.

RETURNING TO FUNDAMENTALS

Seeing the economic jeopardy facing an entire region’s clean water plants, SWSC recognized a crucial role that needed to be filled. SWSC stepped into it by partnering with the Massachusetts Department of Environmental Protection (MassDEP), which had its own concerns about the impending nitrogen regulations, and the US Geological Survey for its scientific expertise.

In late 2017, SWSC and its partners developed and installed a new river gauge and nitrogen sampling program at the borders with Vermont and New Hampshire. The gauge and sampling program will complement existing and recently enhanced

USGS nitrogen sampling at the Connecticut border to more accurately profile the current volume and fate of nitrogen entering and leaving Massachusetts.

The new data, which are collected weekly, will be used to contribute to the scientific review of the LIS NRS. But more importantly, they are also expected to illustrate the need to return to the fundamentals—transparency, stakeholder involvement, and sound science—that shaped the original TMDL. Meanwhile, NACWA actively monitors the progress of the LIS NRS and engages EPA Regions 1 and 2 in outlining its concerns with the lack of stakeholder input, structure, and legal and scientific basis for the LIS NRS.

REGIONAL CONCERNS, NATIONAL STAKES

Along New England’s longest river, it is clear that the fate of nitrogen also carries the future of clean water investments for the next generation of ratepayers. To protect the public’s trust in its work and that of the clean water community in its region, SWSC was compelled to fulfill a crucial need—statistically meaningful data—that might historically have been provided by its regulator, the EPA.

Suffering from years of budget and staff cuts, the EPA faces more challenges than ever to execute its critical mission. State environmental agencies have often fared little better, while substantial public funding for clean water infrastructure is virtually nonexistent. In this challenging environment, utilities should feel obliged and empowered to identify when the regulatory process has become distorted by funding and capacity constraints and, if needed, invest in material contributions to change the trajectory. 

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