

Non-tidal Passaic River Basin Water Quality Trading Project
*Review of the Whippany River Total Maximum Daily Load
and Interim Total Phosphorus Reduction Plan for the Whippany River Watershed*

The Whippany River Total Maximum Daily Load (TMDL) for fecal coliform was adopted by the New Jersey Department of Environmental Protection (NJDEP) in December 1999. This milestone TMDL was the first ever adopted by NJDEP. The document also included an Interim Total Phosphorus Reduction Plan for the Whippany River Watershed.

Need for a fecal coliform TMDL: New Jersey Surface Water Criteria specify that for FW2 waters, fecal coliform levels “shall not exceed a geometric average of 200 counts per 100 ml, nor should more than 10 percent of the total samples taken during any 30-day period exceed 400 counts per 100 ml” (N.J.A.C. 7:9B-1.14(c)1.ii). The 1998 New Jersey 303(d) list identified two locations on the Whippany River (Morristown and near Pine Brook) where excessive fecal coliform concentrations were causing water quality impairments.

Sources: Primary sources of excessive fecal coliform concentrations were determined to be:

- Malfunctioning or older improperly sized septic systems in the upper Whippany River Watershed
- Canada geese, waterfowl, and other wildlife
- Pet waste
- Stormwater basins which can act as accumulation points of fecal matter

Fecal coliform contamination was 99.9% due to nonpoint sources, and only 0.1% due to point sources. Residential and mixed urban land uses were the primary zones of nonpoint source fecal coliform pollution.

TMDL allocations: A dynamic model which integrated an overland runoff model with a spatially explicit receiving water model was calibrated and validated. The model was applied to calculate TMDL allocations necessary to achieve the fecal coliform Surface Water Criteria. No reduction was necessary for point sources. **A 58.5% reduction on overall nonpoint source loads was necessary to achieve the simulated target condition.** The modeling approach sufficiently accounted for seasonal variations and provided an adequate margin of safety. The model accounted for the critical condition when intense rainfall over about 10 days follows a dry period.

Implementation: The TMDL outlined a monitoring plan and management measures for nonpoint sources of fecal coliform. The monitoring is conducted through the Ambient Surface Water Monitoring Network Program with emphasis on summer months.

Short-term management measures included the implementation of structural Best Management Practices (BMPs), model ordinances, a diagnostic study of fecal impairment in the upper Whippany River Watershed, an inter-municipal agreement regarding land and water resources in the watershed, and publication of a nonpoint source pollution control guidance manual entitled 'A Cleaner Whippany River Watershed'. The guidance manual identifies thirteen stormwater source control measures and provides a methodology to assist users in choosing a suitable BMP. The manual explains which

BMPs are best suited to controlling specific nonpoint source pollutants, and what level of pollutant removal a BMP can achieve.

Long-term management measures were also identified to control

- Malfunctioning or older improperly sized septic systems
- Canada geese, pest waterfowl, and other wildlife
- Pet waste
- Stormwater basins

Current Status: The two locations previously identified in the 1998 New Jersey 303(d) list as impaired for fecal coliform were identified on Sublist 4 of the 2004 New Jersey 303(d) list. This means that although water quality standards are still violated, attainment is expected in the near future due to the existing TMDL.

Interim Total Phosphorus Reduction Plan: Besides addressing fecal coliform, the document also established an Interim Total Phosphorus Reduction Plan. The plan recognized that while the Whippany River was in compliance with Surface Water Quality Standards for phosphorus, excessive phosphorus levels further downstream caused adverse impacts to the Passaic River. A Passaic River TMDL would need to establish how much, if any, total phosphorus from the Whippany River is contributing to downstream total phosphorus levels. Consequently, an interim plan to reduce total phosphorus from point sources was implemented in the absence of a TMDL for the Passaic River. The Interim Total Phosphorus Reduction Plan required that in the interim period between adoption of this Plan and the adoption of the Passaic River TMDL, municipal point source dischargers within the Whippany River would investigate and implement appropriate low cost methods to reduce phosphorus effluent loading. The

goal of these interim measures was to achieve a net reduction of phosphorus loading from the permittees before the Passaic River TMDL is developed. NJDEP revised NJDPES permits based on a calculation of existing effluent quality and applicable low-cost improvement measures. **The interim limits shall remain in effect until establishment of the Passaic River Basin TMDL.**

Measures for controlling nonpoint source pollution of fecal coliform were also expected to have cross benefits for reducing phosphorus loadings. For example, ‘A Cleaner Whippany River Watershed’ (guidance manual on nonpoint source pollution controls) outlined six BMPs to control fecal coliform. All six BMPs are also effective in reducing total phosphorus concentrations.

Conclusions: The TMDL was instrumental in affecting development of other TMDLs. The process employed and level of stakeholder engagement and public participation were outstanding (e.g. Whippany Watershed Partnership). Many of the measures to reduce nonpoint source fecal coliform have ancillary benefits to reducing phosphorus. The Interim Total Phosphorus Reduction Plan has resulted in lower phosphorus effluent concentrations from affected plants.

REFERENCES

New Jersey Department of Environmental Protection (NJDEP) (1999). “Report on the Establishment of a Total Maximum Daily Load for Fecal Coliform and an Interim Total Phosphorus Reduction Plan for the Whippany River Watershed.”

NJDEP in collaboration with the Whippany Nonpoint Source Work Group (2000). “A Cleaner Whippany River Watershed: Nonpoint Source Pollution Control Guidance Manual for Municipal Officials, Engineers and Departments of Public Works.”