

R1: Summary of Vermont's Potash Brook TMDL for Biological Impairment using Stormwater Runoff as Surrogate

Impairment/Pollutant: Potash Brook is impaired for aquatic life support caused by stormwater-related stressors. The TMDL uses stormwater runoff volume as a surrogate for sediment and a variety of other stressors associated with stormwater. The use of stormwater runoff volume targets allows the TMDL to address not only wash-off sediment and other watershed pollutants associated with stormwater, but also sediment loads generated from within the channel system (especially from bank erosion), and other stresses to aquatic life caused by stormwater flows. The TMDL package includes an expanded technical analysis that provides an explanation of all stressors potentially contributing to the biological impairment in Potash Brook, and how these stressors are linked to stormwater runoff.

Water Quality Target: The impairment is based on biological indices so there is no one numeric pollutant criterion to use as the TMDL target. Instead, the in-stream target is expressed as a measure of the hydrologic condition believed necessary to achieve the Vermont water quality criteria for aquatic life. A high flow reduction target of 16% was established based on the hydrologic conditions of two reference watersheds where the aquatic life criteria are attained. The reference watersheds were selected using a careful statistical analysis of the watershed characteristics of 15 candidate reference watersheds. Flow duration curves were simulated for both Potash Brook and the reference watersheds, and the difference between the 0.3% point on the curves was used to derive the reduction target. The 0.3% flow was selected because it approximately equals the one year flow and the channel forming flow for this stream, and stormwater BMPs can be readily designed to meet reduction targets for this flow using the Vermont State Stormwater Manual.

Loading Capacity: In this TMDL, because the “pollutant of concern” is represented by the surrogate of stormwater runoff volume, the loading capacity is the greatest volume of stormwater runoff the brook can receive without violating aquatic life criteria. Given that streamflow during high flow events is nearly entirely a result of stormwater runoff, the 16% reduction target described above is used not only as the in-stream water quality target but also as the stormwater runoff volume reduction target.

Load and Wasteload Allocations and Margin of Safety: The vast majority of reductions (91%) are assigned to the wasteload. The wasteload allocation applies to runoff from both NPDES-regulated and unregulated urban and developed portions of the watershed, and includes an allocation for future growth. The load allocation applies to the limited agricultural and open space portions of the watershed. The Margin of Safety is implicit from careful selection of the reference streams and use of a conservative flow target.

Implementation Plan: The State plans to implement the TMDL immediately, through an iterative, adaptive management approach utilizing a watershed permit authorized by Vermont law. The State expects to issue a State watershed permit in 2007 that will specify the type and location of BMPs necessary to achieve the stormwater runoff reductions called for in the TMDL. A comprehensive monitoring program (including BMP tracking along with regular in-stream biological, flow, and geomorphic assessments) will be used to measure progress towards water quality standards and to amend the permit as needed. The State will also include conditions for BMP implementation in all applicable NPDES permits.

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