

June 21, 2002

Christopher Recchia, Commissioner
Vermont Department of Environmental Conservation
103 South Main St. 1 S
Waterbury VT 05671-0401

SUBJECT: Notification of Approval of Styles Brook and Tributary 1 TMDLs

Dear Mr. Recchia:

Thank you for your submittal of the Total Maximum Daily Loads (TMDLs) for Styles Brook and Tributary 1 to North Branch Ball Mountain Brook (both for sediment). These waterbodies are included on Vermont's 1998 and 2000 303(d) lists as high priorities for TMDL development to protect aquatic life.

The U.S. Environmental Protection Agency (EPA) hereby approves Vermont's December 2001 sediment TMDLs for Styles Brook and Tributary 1 to North Branch Ball Mountain Brook. EPA has determined that these TMDLs meet the requirements of §303(d) of the Clean Water Act (CWA), and of EPA's implementing regulations (40 CFR Part 130). Enclosed are copies of our approval documentation for each TMDL

Please note that our approval of this approach to sediment TMDLs is based on the specific circumstances present in these cases. Whether this approach is appropriate for future sediment TMDLs should be discussed on a case-by-case basis between DEC and EPA.

My staff and I look forward to continued cooperation with the VT DEC in exercising our shared responsibility of implementing the requirements under Section 303(d) of the CWA.

Sincerely,

Linda M. Murphy, Director
Office of Ecosystem Protection

cc: Wally McLean, Tim Clear, VT DEC

Enclosures

In-house distribution:

Alison Simcox
Ann Williams
Jerry Potamis
Mel Cote
Eric Perkins

EPA NEW ENGLAND'S TMDL REVIEW

TMDL: Tributary #1 to North Branch Ball Mountain Brook
Waterbody ID: VT11-15, Class B listed 1998 and 2000 for sediment/NPS
West River Watershed in Windham County
Town: Stratton, VT

STATUS: Final

DATE: June 20, 2002

IMPAIRMENT/POLLUTANT: Habitat degradation (high substrate embeddedness) primarily from excessive sand/silt loading. The TMDL is proposed for sediment.

BACKGROUND: The Vermont Department of Environmental Conservation (VTDEC) submitted to EPA New England a draft *Total Maximum Daily Load for Sediment, Tributary #1 to North Branch Ball Mountain Brook* in January 2000. In response to EPA comments, VT DEC submitted a revised TMDL in July 2000. Following a subsequent comment letter from EPA, VT DEC made additional changes to the TMDL, solicited public comment on the document, and submitted the final TMDL in December 2001. The TMDL was submitted under a cover letter, dated December 21, 2001 (received by EPA December 26, 2001). The TMDL submittal includes the May 20, 1999 report by Pioneer Environmental Associates, Llc., *The Stratton Corporation Stratton Master Plan Water Quality Remediation Plan* (referred to as 'the Stratton Master Plan' below), which provides the technical basis for the TMDL.

EPA's administrative record file also includes, among others, the following documents:

- Draft *Total Maximum Daily Load for Tributary #1 to North Branch Ball Mountain Brook* dated January 2000;
- Letter of EPA review comments on the January 2000 draft TMDL (Eric Perkins, EPA to Tim Clear, VT DEC, dated March 15, 2000);
- *Total Maximum Daily Load for Sediment: Tributary #1 to North Branch Ball Mountain Brook* dated July 2000;
- Vermont Natural Resources Council letter of comments on the Styles Brook and Tributary 1 TMDLs (Kelly Lowry, VNRC to Canute Dalmasse, VT DEC and Gerald Potamis, EPA dated August 14, 2000);
- EPA letter to Vermont Natural Resources Council in response to VNRC comments on the TMDL (Gerald Potamis, EPA to Kelly Lowry, VNRC dated December 21, 2000).

- Letter of EPA review comments on the July 2000 TMDL (Eric Perkins, EPA to Tim Clear, VT DEC, dated December 21, 2000);
- Vermont Natural Resources Council letter of comments on Styles Brook and Tributary 1 TMDLs (Kelly Lowry, VNRC to Scott Johnstone, ANR and Gerald Potamis, EPA dated October 12, 2001).
- Vermont DEC email communication from Tim Clear, VT DEC to Eric Perkins, EPA, dated June 10, 2002.

The following review explains how the TMDL submission meets the statutory and regulatory requirements of TMDLs in accordance with Section 303(d) of the Clean Water Act and 40 CFR Part 130.

REVIEWERS: Eric Perkins (617) 918-1602 Email perkins.eric@epa.gov
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REVIEW ELEMENTS OF TMDLs

Section 303(d) of the Clean Water Act (CWA) and EPA's implementing regulations at 40 C.F.R. § 130 describe the statutory and regulatory requirements for approvable TMDLs. The following information is generally necessary for EPA to determine if a submitted TMDL fulfills the legal requirements for approval under Section 303(d) and EPA regulations, and should be included in the submittal package. Use of the verb "must" below denotes information that is required to be submitted because it relates to elements of the TMDL required by the CWA and by regulation.

1. Description of Waterbody, Pollutant of Concern, Pollutant Sources and Priority Ranking

The TMDL analytical document must identify the waterbody as it appears on the State/Tribe's 303(d) list, the pollutant of concern and the priority ranking of the waterbody. The TMDL submittal must include a description of the point and nonpoint sources of the pollutant of concern, including the magnitude and location of the sources. Where it is possible to separate natural background from nonpoint sources, a description of the natural background must be provided, including the magnitude and location of the source(s). Such information is necessary for EPA's review of the load and wasteload allocations which are required by regulation. The TMDL submittal should also contain a description of any important assumptions made in developing the TMDL, such as: (1) the assumed distribution of land use in the watershed; (2) population characteristics, wildlife resources, and other relevant information affecting the characterization of the pollutant of concern and its allocation to sources; (3) present and future

growth trends, if taken into consideration in preparing the TMDL; and, (4) explanation and analytical basis for expressing the TMDL through surrogate measures, if applicable. Surrogate measures are parameters such as percent fines and turbidity for sediment impairments, or chlorophyll a and phosphorus loadings for excess algae.

The TMDL for Tributary #1 to North Branch Ball Mountain Brook describes the waterbody and the cause of impairment as identified in Vermont's 1998 303(d) list. The document describes the pollutant of concern, sediment. It also addresses altered hydrologic conditions that, although not considered 'pollutants' by EPA, play a direct role in both sediment loading and stream habitat alteration. The document states that the waterbody is among those scheduled for TMDL development by 2002, indicating a high priority ranking considering that waters on the 303(d) list are scheduled over a 15 year period extending to 2013.

The TMDL includes a prioritized list of sediment sources based on an impact ranking. Sources include parking lots, road crossings, drainage ditches, and a variety of specific sites.

Tributary 1 is also impaired by filamentous algae attributed to increased available light and nutrients. While the TMDL is written for sediment, the document states that the anticipated remediation measures are expected to also address this ancillary impact. Since phosphorus has a strong affinity to particulate matter, the TMDL concludes that the significant reductions in solids loading together with the restoration of riparian vegetation called for in the Stratton Master Plan will be sufficient to significantly limit instream algae growth.

Assessment: VT DEC has adequately identified the waterbody, the pollutants of concern, the sources of pollution, and the relative magnitude/impact of sources. The TMDL also includes an adequate description of the assumptions made in developing the TMDL.

2. Description of the Applicable Water Quality Standards and Numeric Water Quality Target

The TMDL submittal must include a description of the applicable State/Tribe water quality standard, including the designated use(s) of the waterbody, the applicable numeric or narrative water quality criterion, and the antidegradation policy. Such information is necessary for EPA's review of the load and wasteload allocations which are required by regulation. A numeric water quality target for the TMDL (a quantitative value used to measure whether or not the applicable water quality standard is attained) must be identified. If the TMDL is based on a target other than a numeric water quality criterion, then a numeric expression, usually site specific, must be developed from a narrative criterion and a description of the process used to derive the target must be included in the submittal.

The TMDL for Tributary #1 to North Branch Ball Mountain Brook describes the applicable water quality standards, which include narrative criteria as well as the designated uses for a Class B water, which specify that the water be "...of a quality that consistently exhibits good aesthetic value and provides high quality habitat for aquatic biota, fish and wildlife." The TMDL also cites Vermont's antidegradation policy. VT DEC has interpreted its narrative criteria for Tributary #1 by selecting a quantitative water quality target using in-stream macroinvertebrate biocriteria. The water-quality target is set using biometrics shown on Table 1 of the TMDL (p. 4) specifying numeric goals for indices such as organism density, species richness, EPT/richness and the biotic index. Once these targets are achieved, VT DEC predicts Tributary #1 will fully support an aquatic community consistent with Vermont's Class B Water Quality Standards. The TMDL also specifies sediment targets in terms of percent embeddedness and percent Oligocheata.

Assessment: VT DEC has adequately described applicable water quality standards.

3. Loading Capacity - Linking Water Quality and Pollutant Sources

As described in EPA guidance, a TMDL identifies the loading capacity of a waterbody for a particular pollutant. EPA regulations define loading capacity as the greatest amount of loading that a water can receive without violating water quality standards (40 C.F.R. § 130.2(f)). The loadings are required to be expressed as either mass-per-time, toxicity or other appropriate measure (40 C.F.R. § 130.2(i)). The TMDL submittal must identify the waterbody's loading capacity for the applicable pollutant and describe the rationale for the method used to establish the cause-and-effect relationship between the numeric target and the identified pollutant sources. In most instances, this method will be a water quality model. Supporting documentation for the TMDL analysis must also be contained in the submittal, including the basis for assumptions, strengths and weaknesses in the analytical process, results from water quality modeling, etc. Such information is necessary for EPA's review of the load and wasteload allocations which are required by regulation.

In many circumstances, a critical condition must be described and related to physical conditions in the waterbody as part of the analysis of loading capacity (40 C.F.R. § 130.7(c)(1)). The critical condition can be thought of as the "worst case" scenario of environmental conditions in the waterbody in which the loading expressed in the TMDL for the pollutant of concern will continue to meet water quality standards. Critical conditions are the combination of environmental factors (e.g., flow, temperature, etc.) that results in attaining and maintaining the water quality criterion and has an acceptably low frequency of occurrence. Critical conditions are important because they describe the factors that combine to cause a violation of water quality standards and will help in identifying the actions that may have to be undertaken to meet water quality standards.

The TMDL identifies a number of numeric water quality targets including invertebrate biometrics and sediment indices. VT has determined, based on extensive monitoring, that the aquatic life impairment is due to habitat degradation caused by excessive deposition of fine sediments, although nutrient enrichment is also identified in the attached Fiske Memo. Therefore, the primary numeric water quality target in the TMDL used to establish the link between sediment loading and water quality is % embeddedness.

VT DEC used Best Professional Judgment (BPJ) based on an extensive visual assessment of the watershed for Tributary #1 to link the desired water-quality target to sediment source areas. EPA New England concurs with this approach for addressing nonpoint source pollution concerns, especially when it is possible to identify pollutant sources, but difficult to estimate loading from those sources.

Quantification of overall sediment loading is presented in the TMDL using the percent embeddedness measures. This analysis helps describe the extent of the impairment, and more importantly, estimates the magnitude of the overall sediment loading reduction needed to achieve water quality goals. The approach estimates the actual loading to the bed (the cause of the impairment) based on embeddedness observations and eliminates many of the uncertainties and complexities involved with monitoring water column suspended solids concentrations and predicting the fate and transport of sediment originating from the watershed. By estimating volumes of sediment associated with both pre-remediation and targeted levels of cobble embeddedness, the TMDL calculates a pre-remediation sedimentation loading of 15.3-22.9 kg/m², a target loading (and loading capacity) of 7.6 kg/m², and a needed loading reduction of 50-67%. The loading is not expressed as mass per unit time, and instead uses "other appropriate terms" as allowed in 40 CFR §130.2(i). The TMDL justifies this decision based on the nature of sediment loading and deposition in small mountain streams and the extremely imprecise methodologies available for estimating this loading in terms of mass per unit time.

VNRC, in its October 12, 2001 comment letter, expresses concern that the TMDL fails to include a loading capacity or load allocations expressed as daily loads.

EPA New England believes that VT DEC's approach to estimating the loading capacity and loading reductions needed is reasonable under the circumstances. EPA concurs with the State's determination not to express loading estimates as daily loading rates in this case, because sediment loadings in small mountain watersheds are largely a function of rainfall and snowmelt events that occur unevenly throughout the year and are very difficult to estimate. In addition, the impairment is not sensitive to loading variations on a daily basis but rather on a seasonal or annual basis. If data were available to support the calculation of the current annual loading rate, than expressing the load allocation as an annual loading rate would be appropriate. But given that these data are not available, EPA accepts that the next best approach is to express the load allocation as an overall percent reduction in watershed loading. By tying the watershed load reduction directly to the percent reduction in bottom sediment necessary to meet the embeddedness goals, the

State provides a meaningful reduction target that can be linked to the attainment of water quality standards (aquatic life indices).

Assessment: VT DEC has adequately identified a loading capacity for the TMDL, and has adequately justified the expression of the loading capacity in terms other than mass per unit time.

4. Load Allocations (LAs)

EPA regulations require that a TMDL include LAs, which identify the portion of the loading capacity allocated to existing and future nonpoint sources and to natural background (40 C.F.R. § 130.2(g)). Load allocations may range from reasonably accurate estimates to gross allotments (40 C.F.R. § 130.2(g)). Where it is possible to separate natural background from nonpoint sources, load allocations should be described separately for background and for nonpoint sources.

If the TMDL concludes that there are no nonpoint sources and/or natural background, or the TMDL recommends a zero load allocation, the LA must be expressed as zero. If the TMDL recommends a zero LA after considering all pollutant sources, there must be a discussion of the reasoning behind this decision, since a zero LA implies an allocation only to point sources will result in attainment of the applicable water quality standard, and all nonpoint and background sources will be removed.

As noted above (in part 3) the TMDL calculates a needed sediment loading reduction of 50-67%. This reduction is expressed as the load allocation, and it is applied to all nonpoint sources (in aggregate) in the watershed. The necessary reduction is expressed as a range because the percent embeddedness under current conditions ranges from 50-75%.

However, to ensure that the target of 25% embeddedness is achieved throughout the stream segment, the upper end of the range of loading reductions will need to occur. Recent communications with VT DEC (see attached 6/10/02 email from Tim Clear to Eric Perkins) have confirmed that the State intends the load allocation to be the 67% reduction identified in the range.

As discussed above, the decision to express the load allocation in terms of a percent reduction rather than mass per unit time is reasonable based on the difficulties of estimating sediment loadings in small mountain watersheds and the benefits of linking the load allocation more directly to the water quality impairment via the imbeddedness calculations. In addition, the load that would result from a 67% reduction in current loadings can reasonably be interpreted to be an annual load which will result in compliance with water quality standards (see attached 6/10/02 email cited above).

VT DEC identified and ranked sediment sources without quantifying the magnitude of individual sources. EPA considers VT DEC's decision to aggregate the load allocation rather than establishing loading estimates for individual sources to be reasonable because of the complexities involved with predicting the magnitude of sources, the uncertainties associated with the fate and transport of solids in a watershed, and the lack of site specific sediment data.

The TMDL includes future growth in the load allocation. Future development will require state permits designed to ensure that the overall 67% loading reduction still occurs within the watershed.

Assessment: The TMDL includes an adequate load allocation as required by EPA regulations.

5. Wasteload Allocations (WLAs)

EPA regulations require that a TMDL include WLAs, which identify the portion of the loading capacity allocated to existing and future point sources (40 C.F.R. § 130.2(h)). If no point sources are present or if the TMDL recommends a zero WLA for point sources, the WLA must be expressed as zero. If the TMDL recommends a zero WLA after considering all pollutant sources, there must be a discussion of the reasoning behind this decision, since a zero WLA implies an allocation only to nonpoint sources and background will result in attainment of the applicable water quality standard, and all point sources will be removed.

In preparing the wasteload allocations, it is not necessary that each individual point source be assigned a portion of the allocation of pollutant loading capacity. When the source is a minor discharger of the pollutant of concern or if the source is contained within an aggregated general permit, an aggregated WLA can be assigned to the group of facilities. But it is necessary to allocate the loading capacity among individual point sources as necessary to meet the water quality standard.

The TMDL submittal should also discuss whether a point source is given a less stringent wasteload allocation based on an assumption that nonpoint source load reductions will occur. In such cases, the State/Tribe will need to demonstrate reasonable assurance that the nonpoint source reductions will occur within a reasonable time.

The TMDL sets the WLA at zero. The watershed includes a number of stormwater discharge conveyances, but these are all included in the load allocation because the discharges are not currently subject to NPDES permits.

In its 10/12/01 comment letter, VNRC expresses concern that the TMDL fails to identify and allocate sediment loading to point sources issued state stormwater permits by VT DEC.

EPA New England believes that VT DEC's approach is reasonable and that it is logical to include these discharges in the load allocation because of the difficulty of separating out the sediment contributions of these sources from all the other nonpoint sources in the watershed. Under existing TMDL regulations, WLAs are required to be developed for point source stormwater discharges that are subject to the NPDES permit program. Neither the regulations nor EPA's 1991 guidance addresses how stormwater point source discharges which are not subject to NPDES permits (such as those in the Stratton watershed) should be treated. Therefore, EPA believes states have some flexibility to decide whether to assign wasteload or load allocations in such a circumstance.

Assessment: EPA-New England concludes that the WLA component of the TMDL is reasonably set equal to zero.

6. Margin of Safety (MOS)

The statute and regulations require that a TMDL include a margin of safety to account for any lack of knowledge concerning the relationship between load and wasteload allocations and water quality (CWA § 303(d)(1)(C), 40 C.F.R. § 130.7(c)(1)). EPA guidance explains that the MOS may be implicit, i.e., incorporated into the TMDL through conservative assumptions in the analysis, or explicit, i.e., expressed in the TMDL as loadings set aside for the MOS. If the MOS is implicit, the conservative assumptions in the analysis that account for the MOS must be described. If the MOS is explicit, the loading set aside for the MOS must be identified.

The Tributary #1 TMDL includes an implicit MOS in the selection of the embeddedness target. Since the "good" embeddedness rating covers a wide range of values from 25% to 50% and in most instances provides adequate habitat for the expected macroinvertebrate community, an MOS is built into the selection of the <25% target.

Assessment: The TMDL includes an adequate margin of safety.

7. Seasonal Variation

The statute and regulations require that a TMDL be established with consideration of seasonal variations. The method chosen for including seasonal variations in the TMDL must be described (CWA § 303(d)(1)(C), 40 C.F.R. § 130.7(c)(1)).

The Tributary #1 TMDL addresses seasonal variation in loading by setting an overall water-quality target and focusing on source control or elimination rather than setting a daily load.

Assessment: Seasonal variation is adequately addressed, as the document states that the TMDL will be protective of water quality throughout the year and that the selected numeric water quality endpoints represent water quality conditions that are a result of the cumulative impacts of both dry and wet weather conditions that occur over an extended period of time.

8. Monitoring Plan for TMDLs Developed Under the Phased Approach

EPA's 1991 document, Guidance for Water Quality-Based Decisions: The TMDL Process (EPA 440/4-91-001), recommends a monitoring plan when a TMDL is developed under the phased approach. The guidance recommends that a TMDL developed under the phased approach also should provide assurances that nonpoint source controls will achieve expected load reductions. The phased approach is appropriate when a TMDL involves both point and nonpoint sources and the point source is given a less stringent wasteload allocation based on an assumption that nonpoint source load reductions will occur. EPA's guidance provides that a TMDL developed under the phased approach should include a monitoring plan that describes the additional data to be collected to determine if the load reductions required by the TMDL lead to attainment of water quality standards.

Stratton Corporation, under VT DEC's guidance, will continue to support long-term monitoring of Tributary #1 (see Stratton Master Plan, p. 46) to evaluate the effectiveness of sediment controls and the adequacy of the TMDL. The Stratton Master Plan describes the parameters, stations and frequency of this monitoring which will continue at least through 2005. VT DEC expects water quality targets to be met by or before 2005. The monitoring will include the Pebble Count Procedure and Percent Embeddedness along with macroinvertebrate monitoring and a host of chemical and physical parameters.

Assessment: This TMDL was not developed under the phased approach. Nevertheless, EPA New England has reviewed the monitoring plan and concludes that the proposed monitoring will be sufficient to evaluate the adequacy of the TMDL over the five year implementation period.

9. Implementation Plans

On August 8, 1997, Bob Perciasepe (EPA Assistant Administrator for the Office of Water) issued a memorandum, "New Policies for Establishing and Implementing Total Maximum Daily Loads (TMDLs)," that directs Regions to work in partnership with States/Tribes to achieve nonpoint source load allocations established for 303(d)-listed waters impaired solely or primarily by

nonpoint sources. To this end, the memorandum asks that Regions assist States/Tribes in developing implementation plans that include reasonable assurances that the nonpoint source load allocations established in TMDLs for waters impaired solely or primarily by nonpoint sources will in fact be achieved. The memorandum also includes a discussion of renewed focus on the public participation process and recognition of other relevant watershed management processes used in the TMDL process. Although implementation plans are not approved by EPA, they help establish the basis for EPA's approval of TMDLs.

The TMDL implementation plan for Tributary #1 is described on pages 14 and 15 of the TMDL and pages 37-39 of the Stratton Master Plan. Remediation measures will be implemented by Stratton Corporation and have been ranked according to the magnitude of their expected water quality benefits. A detailed implementation schedule provides for the major sediment sources to be addressed first (many have already been completed), with remaining measures occurring in the near future.

Assessment: The implementation plan element is adequately addressed. EPA New England concludes that a strong implementation plan is in place to achieve the goals of the TMDL.

10. Reasonable Assurances

EPA guidance calls for reasonable assurances when TMDLs are developed for waters impaired by both point and nonpoint sources. In a water impaired by both point and nonpoint sources, where a point source is given a less stringent wasteload allocation based on an assumption that nonpoint source load reductions will occur, reasonable assurance that the nonpoint source reductions will happen must be explained in order for the TMDL to be approvable. This information is necessary for EPA to determine that the load and wasteload allocations will achieve water quality standards.

In a water impaired solely by nonpoint sources, reasonable assurances that load reductions will be achieved are not required in order for a TMDL to be approvable. However, for such nonpoint source-only waters, States/Tribes are strongly encouraged to provide reasonable assurances regarding achievement of load allocations in the implementation plans described in section 9, above. As described in the August 8, 1997 Perciasepe memorandum, such reasonable assurances should be included in State/Tribe implementation plans and "may be non-regulatory, regulatory, or incentive-based, consistent with applicable laws and programs."

As specified in the Vermont Act 250 permit, Stratton Corporation, the primary landowner, will be ineligible for future development permits outside the scope of the remediation plan until Tributary 1 attains water quality standards. This provides a powerful incentive for implementation of the remediation measures. Additionally, the monitoring plan provides for annual reports to VT ANR indicating progress toward water

quality targets. The reports will also indicate any modifications to remediation measures needed to meet these targets.

Assessment: Because this is a nonpoint source-only impaired water, reasonable assurances that the reductions are achieved are not necessary for the TMDL to receive EPA approval. Nevertheless, EPA New England concludes that the TMDL does provide “reasonable assurances” that the sediment load reductions will occur.

11. Public Participation

EPA policy is that there must be full and meaningful public participation in the TMDL development process. Each State/Tribe must, therefore, provide for public participation consistent with its own continuing planning process and public participation requirements (40 C.F.R. § 130.7(c)(1)(ii)). In guidance, EPA has explained that final TMDLs submitted to EPA for review and approval must describe the State/Tribe’s public participation process, including a summary of significant comments and the State/Tribe’s responses to those comments. When EPA establishes a TMDL, EPA regulations require EPA to publish a notice seeking public comment (40 C.F.R. § 130.7(d)(2)).

Inadequate public participation could be a basis for disapproving a TMDL; however, where EPA determines that a State/Tribe has not provided adequate public participation, EPA may defer its approval action until adequate public participation has been provided for, either by the State/Tribe or by EPA.

In addition to public involvement during the Act 250 process, the public participation process for the Tributary #1 TMDL included a 30 day public comment period on the final TMDL document. This process, including the issuance of public notice, was conducted in accordance with VT DEC’s requirements for public participation. Two written comments were received by VT DEC. Appendix B of the TMDL includes a summary of comments received and responses to these comments.

Assessment: EPA New England concludes that the public participation requirements have been adequately addressed, and that VT DEC has adequately addressed comments received on the TMDL.