

**TOTAL MAXIMUM DAILY LOAD
for SEDIMENT**

STYLES BROOK

Waterbody ID: 11-15

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Table of Contents

Introduction and Waterbody Description	1
Problem Assessment and Pollutant Sources	1
Problem Assessment	1
Priority Ranking	2
Pollutant of Concern	2
Pollutant Sources	2
Natural Background	3
Applicable Water Quality Standards and Numeric Water Quality Target	3
State Water Quality Standard	3
Designated Uses	4
Antidegradation Policy	4
Numeric Water Quality Target	4
Linkage Analysis	6
TMDL Allocations	9
Wasteload Allocations	9
Load Allocations	9
Margin of Safety	10
Seasonal Variation	10
Monitoring Plan for TMDL Development Under the Phased Approach	11
Implementation Plan	11
Strategies to Remediate Impairments	11
Implementation Schedule	12
Reasonable Assurances	12
Public Participation	12
Appendix A: Act 250 Hearing Information and the 10 Criteria and	
Act 250 Notice Application and Hearing concerning Stratton Master Plan and Water	
Quality Remediation Plan	
Supporting Documentation (under separate cover)	
1. Stratton Master Plan-Water Quality Remediation Plan	

Introduction and Waterbody Description

The impaired water for which this TMDL was developed is identified on the 1998 Vermont 303(d) List as Styles Brook and is located by the Waterbody ID VT11-15. This stream is located in the upper reaches of the West River Basin in subbasin 11-15, as defined by the State of Vermont River Basins map. The stream is classified as Class B in the Vermont Water Quality Standards effective April 21, 1997, the Standards to which this TMDL aims to restore the impaired water.

Styles Brook and its associated watershed of 1.07 square miles lies almost entirely within the holdings of a single property owner. The Stratton Corporation, single owner of a ski resort and associated adjacent properties, developed a multi-year development Master Plan which was submitted for review under Vermont's Act 250 land use and development control law. According to the Act 250 review process, one aspect is to review potential effects development may have on adjacent water resources. Since waters listed on the 1998 303(d) list were identified within the area of impact, including Styles Brook, a requirement of permit approval was the development of a remediation plan to restore impaired waters. Stratton Corporation agreed to develop and implement a water quality remediation plan.

One permit requirement of Act 250 was the Stratton Master Plan-Water Quality Remediation Plan (SWQRP), developed by Pioneer Environmental Associates, LLC with review, comment and approval provided by the Vermont Department of Environmental Conservation, Division of Water Quality. This plan provides the basis for the TMDL and is referred to extensively throughout this document and provides the necessary supporting information. The SWQRP is provided as supporting documentation under a separate cover.

A description of the watershed is given in the SWQRP, Section 2.1 including stream descriptions, existing land uses and other detailed information. A site plan of the watershed is given as an Appendix map in the SWQRP where the Styles Brook watershed is identified as the sum of the sub-basins labeled "C."

Problem Assessment and Pollutant Sources

Problem Assessment

Macroinvertebrate sampling and habitat assessment of Styles Brook was conducted by the State of Vermont in 1993, 1994 and 1998. Results of each sampling identified the biologic integrity of the stream to be fair and that it was not meeting the minimum Class B criteria. Indications were that the impairment was based on habitat degradation primarily from excessive sand/silt loading. Habitat evaluation revealed a high substrate embeddedness, consistently in the range of 50- 75%. From these evaluations, Styles Brook was placed on the 1998 303(d) List of Impaired Waters. A more complete description of the history of biological and habitat assessment is given in the SWQRP, Section 2.1.7.

Priority Ranking

According to the 1998 Vermont 303(d) List, TMDL development for Styles Brook was scheduled for 2002, which represents a high priority scheduling for TMDL development. Waters listed on the 1998 303(d) List were prioritized over a period of 15 years, through 2013. Watershed planning efforts in the state in conjunction with the SWQRP allowed this TMDL investigation, and subsequent management plan, to be developed earlier than anticipated.

Pollutant of Concern

The Styles Brook TMDL was developed for sediment. High degrees of substrate embeddedness, primarily from sand, have degraded macroinvertebrate habitat and resulted in an unfavorable shift in the macroinvertebrate community composition.

Pollutant Sources

Field observations were used to document specific areas of nonpoint source sediment loading to Styles Brook which appears to originate from existing disturbed areas within the watershed. The small size of the drainage area and short length of Styles Brook allowed a thorough investigation of sediment sources with a description given in the SWQRP, Section 2.1.3. Specific areas of concern are:

- Mountain work roads
- Obertal and Shatterack developments
- Stratton maintenance facility
- Sand storage area
- Parking lot #5

While the sediment sources listed above are given for specific areas, they fall into several projects prioritized for management actions. Individual restoration projects were given an impact ranking (Table 1) based on field observations and measurements which consider the significance of each of the water quality impact factors identified in Section 2 of the SWQRP. These factors include existing land uses, hydrology, erosion and sediment yield, riparian vegetation, channel processes and water quality.

Table 1. Prioritized areas for management activities based on Impact Ranking.

Impact Ranking	Management area
1	Existing Parking Lot #5
2	Maintenance Facility/Sand Storage
3	Ski trails/work roads
4	Condominium projects
5	Golf School stream buffer
	Roads (private/public) ¹

¹ areas/activities to be field-evaluated during 1999

Most of the prioritized actions above deal primarily with sediment reductions, however, actions proposed for the Golf School stream buffer include reestablishment of the riparian buffer. Lost portions of the riparian buffer were identified as negatively impacting the stream, although were not considered contributing to the primary impairment of Styles Brook.

Natural Background

A distinction was not made between natural background loadings of sediment and the total sediment load to Styles Brook. The assumption was made that because of the small size of the watershed, the problem areas could be identified and treated to minimize sediment loading to the stream. These problem areas were observed to be major contributing factors to impairment. Any natural loading that occurred was considered to be minimal and did not contribute significantly to the impairment.

Applicable Water Quality Standards and Numeric Water Quality Target

State Water Quality Standard

There is no applicable numeric standard for the sediment load carried in streams in the Vermont Water Quality Standards, but Styles Brook is listed as impaired based on narrative criteria. The excessive sedimentation to Styles Brook (as measured through various biometrics) has resulted in a violation of the Vermont Water Quality Standard's § 3-01(B)(5) which states that there shall be:

No change from background conditions that would have an undue adverse effect on the composition of the aquatic biota, the physical or chemical nature of the substrate or the species composition or propagation of fishes.

Designated Uses

Since Styles Brook is rated as a Class B waterbody, the Vermont Water Quality Standards state in § 3-03(A) and that:

Class B waters shall be managed to achieve and maintain a high level of quality, that is compatible with the following beneficial values and uses:

including § 3-03(A)(1):

Water of a quality that consistently exhibits good aesthetic value and provides high quality habitat for aquatic biota, fish and wildlife.

Since macroinvertebrate biomonitoring data did not meet the criteria for Class B standards, Styles Brook does not support the designated uses for Class B waters.

Antidegradation Policy

In addition to the above standards, the Vermont Water Quality Standards contain, in part, the following antidegradation policy in § 1-03(A):

The waters of the State shall be managed in accordance with the Water Quality Standards to protect, maintain and improve water quality in such a manner that the beneficial values and uses associated with their classification are attained. All waters, except mixing zones, shall be managed so that, at a minimum, a level of water quality compatible with all beneficial values and uses associated with the assigned classification are obtained and maintained.

Numeric Water Quality Target

Section 303(d)(1)(C) of the Clean Water Act states that TMDLs "shall be expressed at a level necessary to implement the applicable water quality standards..." Without specific numeric targets defining "undue adverse effect" stated in the Vermont Water Quality Standards, a set of numeric biological community criteria were established to identify when conditions were not fully supporting the standards. The VT DEC uses a variety of biological indicators to identify when conditions exist that are not fully supportive of the expected aquatic community for a particular stream type. Table 2 lists the specific macroinvertebrate biometric values used to determine compliance with the Class B Water Quality Standards. These values were adopted as the numeric targets for the Styles Brook TMDL. The latest results describing the condition of Styles Brook are also include in Table 2.

Table 2. Aquatic invertebrate biometrics, water quality targets and Styles Brook results-1998.

Biometric	Description	Styles Brook Results ¹	Class B Criterion (WQ Targets)
Density	Relative abundance of organisms in a sample	397	> 500
Species Richness	Number of different taxa in a sample unit	38	≥ 30
EPT	Number of water quality sensitive taxa from the insect orders Ephemeroptera, Plecoptera and Trichoptera.	15	≥ 18
EPT/Richness	Ratio of water quality sensitive EPT taxa to all taxa found in Community	0.39	> 0.45
Biotic Index	The community tolerance to organic/nutrient loading, based on the tolerances of the species found in the community	2.21	< 2.75
EPT/EPT & Chironomid	Ratio of density of EPT taxa to EPT and tolerant Chironomidae	0.84	> 0.45
% Dominant Genera	Percent of dominant genera in the community	25	< 40%

¹ As assessed on September 14, 1998 by VTDEC personnel.

Sediment targets were also developed as restoration goals for Styles Brook and are given below in Table 3. While the biological criteria given in Table 2 are the ultimate measure for attainment of water quality standards, the sediment targets act as another means of tracking the effectiveness of the phased implementation measures. A further description of the sediment targets is given in section 5.3.2 of the SWQRP.

Table 3. Sediment Indices, Targets and Status of Styles Brook.

Sediment Index	Styles Brook Results ¹	Target Value
% Embeddedness	50-75 %	< 25%
% <i>Oligocheata</i>	28.5	< 5%
Pebble Count	not determined	to be determined

¹ As assessed on September 14, 1998 by VTDEC personnel.

Perhaps the best measure for quantification of sediment loading for this TMDL is percent embeddedness. This index allows both the quantification of sediment loading and provides a measure of macroinvertebrate habitat condition. The pre-remediation percent embeddedness was consistently measured to be 50 - 75 % and a target goal of < 25% was developed. The target goal of 25% embeddedness was selected because it represents an "excellent" substrate condition for benthic macroinvertebrates.¹

Linkage Analysis

The linkage analysis is a required element for a TMDL that establishes the cause-and-effect relationship between measurable water quality targets and identified sources. This can be accomplished through a number of methods from qualitative assumptions based on sound scientific judgement to the use of sophisticated predictive models. The method chosen should be supported by monitoring data that associate waterbody responses to specific loading conditions.

The cause of the impairment in Styles Brook was determined to be excessive sedimentation due to sediment loading as identified by macroinvertebrate community sampling and habitat assessment. This led to an extensive visual watershed assessment directed at locating specific sediment sources. During the qualitative assessment, sediment sources were quite clear in this small watershed and determined to be the primary cause of impairment. Best professional judgement dictated that effective control of all or most observed sediment sources contributing to the impairment would ultimately return the stream to compliance with Class B water quality standards.

This qualitative method to link the desired water quality targets to the observed sources was deemed appropriate in this watershed primarily because of its small area. A thorough survey identified significant pollutant sources that could be addressed by implementing remediation measures. Under the phased TMDL approach, incremental water quality gains are tracked by

¹ USEPA. 1989. Rapid Bioassessment Protocols for Use in Streams and Rivers: Benthic Macroinvertebrates and Fish (EPA440/4-89/001). United States Environmental Protection Agency. Office of Water. Washington, DC.

monitoring as implementation measures are undertaken. The required level of sediment loading reductions are realized when biocriteria standards and numeric targets are met (see Tables 2 & 3).

In addition to the above qualitative linkage, a quantitative assessment of sediment loading was also developed. By using the instream sedimentation target of 25 % embeddedness as the desired endpoint, the required instream load reduction could be calculated. In other words, the current or pre-remediation condition resulted in an instream embeddedness ranging from 50 % to 75 %, so the necessary instream sediment reductions are those that result in an embeddedness rating of 25% or less. It is expected that over time, with reduced sediment loading occurring, the existing instream sediment will move through the stream and a more stable equilibrium between sediment loading and the instream embeddedness will be established. The discussion below describes these calculations.

First, the pre-remediation instream sediment load producing the 50-75 % embeddedness needs to be calculated. By knowing the median size of the dominant natural substrate, the depth of what 50-75 % embeddedness represents, the relative area between the dominant particles where the fines settle, and the physical properties of the sediment fines, in this case sand, this value can be obtained. The values used for the sediment loading calculations are given below in Table 4 and are described in the following discussion.

Field observations reveal that the dominant natural substrate particle size is cobble (64 - 128 mm diameter). While there are other natural particles both larger and smaller than cobble present, namely boulders and gravel respectively, the cobble size class dominates. For the sake of simplification, the median cobble diameter in the size class, 96 mm, is used for the calculations of sediment volumes and loadings. By using the median cobble diameter, the depth of sediment fines can be calculated for both pre-remediation and target conditions of embeddedness. The embeddedness of the pre-remediation condition of 50 - 75 % represents a sediment depth of 48 - 72 mm. The remediation target of 25% embeddedness represents a sediment depth of 24 mm.

Next, by using the observed percentage of sand coverage of stream bottom, the volume of the interstitial spaces between the larger natural particles can be determined for the sediment depths of interest. Sand was observed to cover approximately 10 % of the stream bottom in the areas sampled. On a per square meter basis, this represents 0.1 square meters of sand for every square meter of stream bottom. The pre-remediation volume of fine sediment ranges from 0.0048 to 0.0072 cubic meters and the target volume for 25 % embeddedness equals 0.0024 cubic meters.

When calculating the volume of the sand in the streambed alone, consideration must be given to the porosity of sand. A loose sand mixture has a porosity value of approximately 0.4, that is, approximately 40 % of a given volume is empty space. So in calculating the volume of sand in the stream for any given embeddedness condition, as done above, the volume of the interstitial space between cobbles must be multiplied by 0.6. This product gives the actual volume of sand between the cobbles and disregards the empty spaces between the particles.

Finally, in order to convert the fine sediment volume to a mass per unit area in-stream loading, the physical characteristics of the fine sediment must be considered. Sand has a density of approximately 2.65 grams per cubic centimeter. Multiplying the density by the actual volume of sand in the interstitial spaces gives the resulting in-stream loading for any given depth of embeddedness.

Table 4. Data used to calculate pre-remediation and target sediment loading rates.

Calculation Parameter	Pre-remediation	Target
% Embeddedness	50 -75 %	25 %
Dominant Natural Substrate	cobble	cobble
Median diameter of natural substrate	96 mm	96 mm
Depth of fine sediment	48 - 72 mm	24 mm
Interstitial area between cobbles	0.1 m ²	0.1 m ²
Dominant fine sediment type	sand	sand
Porosity of fine sediment - estimated	0.40	0.40
Density of fine sediment - estimated	2.65 g/cm ³	2.65 g/cm ³

The loading ranges for both the pre-remediation and target values for Styles Brook are given in Table 5. Based on the methodology for determining sediment loading described above, an estimated reduction of solids loading between 50 and 67% will be necessary to meet the instream sediment target of 25 % embeddedness.

Table 5. Estimated instream sediment loading condition.

	Fine sediment (sand) loading (kg/m ²)	% reductions necessary to meet instream target
Pre-remediation	7.6 - 11.4	50 - 67%
Target	3.8	

The strength of this quantitative approach is that it estimates the actual loading to the streambed (the cause of impairment) based on observations and eliminates many of the uncertainties and complexities involved with monitoring water column suspended solids and predicting the fate and transport of sediments originating from the watershed. This method does not attach expected load reductions associated with the various remediation measures, however, as discussed above in the qualitative linkage approach, the size of the watershed allowed extensive visual

investigations of sediment sources and utilized professional judgement to prioritize appropriate remediation measures to attain standards.

TMDL Allocations

The TMDL is considered the loading capacity of a waterbody for a particular pollutant and EPA regulations require that a TMDL include a wasteload allocation (point sources), a load allocation (nonpoint sources) and a margin of safety. The margin of safety accounts for any lack of knowledge concerning the relationship between effluent limitations and water quality. Regulations also require that seasonal variations be considered when determining allocations.

As specified in the regulations, TMDLs may be expressed in terms of either "mass per unit time, toxicity, or other appropriate terms." Because of the nature of sediment loading and deposition in small mountain streams, this TMDL bases its allocations on "other appropriate terms."

Because sediment loading is largely a function of runoff characteristics related to rainfall and snowmelt events, expressing it as daily loading is clearly not appropriate. Annual loading may give a better overall indication of the magnitude of reductions needed, but it is not perfect either, because of the dynamics involved with sediment generation and transport in mountain streams and the role that large infrequent storms have on moving sediment. Annual loadings can fluctuate dramatically.

Instead, the sediment allocation for Styles Brook is given as the percent reduction in sediment loading necessary to achieve an instream condition believed to provide optimal macroinvertebrate habitat conditions. As the calculations from the previous section indicate, the reduction in fine sediment loading to reduce embeddedness from the pre-remediation range of 50-75 % to the target of 25 % is approximately 50-67 %.

Wasteload Allocations

There are no sediment point sources in the watershed discharging to Styles Brook. Therefore, the TMDL recommends a Wasteload Allocation of zero.

Percent reductions of fine sediment loading needed from Point Sources	0 % - there are no point sources present
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Load Allocations

Nonpoint sources of sediment are considered the sole contributing category of pollutant to the impairment of Styles Brook and, therefore, all reductions required in this TMDL are allocated to those sources.

Percent reductions of fine sediment loading needed from Nonpoint Sources	50 - 67 %
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The SWQRP, Section 4.0, establishes a water quality impact ranking for each of the identified contributing sources of impairment. For each identified problem, an associated remediation measure has been scheduled for implementation. By scheduling remediation projects according to their relative beneficial impacts, rapid improvements are expected earlier in the remediation phase rather than later. This adaptive management approach creates an initial expectation for improvement but also allows modification as monitoring results may require.

Margin of Safety

The statute and regulations require a TMDL to include a margin of safety to account for any lack of knowledge concerning the relationship between effluent limitations (or in this case nonpoint source remediation measures) and water quality. This margin of safety can be either implicit in the analysis by using conservative assumptions or explicit as a separate loading allocation. In the case of Styles Brook, an implicit margin of safety was used.

There is an inherent margin of safety established for the Styles Brook TMDL with the selection of a conservative percent embeddedness target of <25 %. A "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 based on stream type. A percent embeddedness rating of less than 25 % is considered "excellent" as interpreted both by the Vermont DEC and EPA's rapid bioassessment protocols and has been selected as the target for this TMDL. With such a conservative target as the goal of the implementation measures, compliance with the Vermont water quality standards should be assured.

Also, since this phased TMDL relies on followup monitoring and adaptive management, an added level of assurance is gained. The adaptive approach being applied in Styles Brook ensures water quality standards will ultimately be met through continued monitoring and remediation actions. If monitoring indicates that implemented projects are not enough to sufficiently improve water quality, then remediation measures continue. Also, as part of the Act 250 permit process, future development in the impaired watershed outside the scope of the remediation plan is not allowed until the water quality standards are met.

Seasonal Variation

A TMDL is also required to consider seasonal variation in the loading analysis and resulting allocations to ensure water quality standards will be met throughout the year under various environmental conditions. Seasonal variation was inherently incorporated in the consideration of this TMDL for Styles Brook and will be protective of water quality throughout the year.

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 extended periods. Because of this, the allocations and resulting implementation measures are directed primarily at reducing sediment sources and not at the sediment delivery mechanisms. By utilizing this approach, seasonal variations have little effect on sediment loading if the sources

are no longer present. Examples include elimination of gravel parking lots and stabilization of eroding soils. The implementation measures selected will be engineered to function under all climatic conditions to sufficiently treat stormwater runoff throughout the year.

Monitoring Plan for TMDL Development Under the Phased Approach

A plan for continued monitoring is essential and required for any phased TMDL. An extensive monitoring plan has been developed and is explained in detail in the SWQRP, Section 5.4. The section below gives the overall monitoring approach and the rationale used for its development. The monitoring of Styles Brook is only a part of an overall monitoring plan provided in the SWQRP. The described monitoring plan provides a holistic monitoring approach including not only the 303(d) listed waters of Styles Brook, but also adjacent impacted watersheds.

Since the implementation of this TMDL and water quality management plan is to be a phased process, a long-term monitoring plan was developed. The overall approach of the monitoring plan is to develop a reliable baseline documenting existing conditions, and to track future changes in water quality resulting from discrete and incremental remediation measures. A five year data collection program was established beginning in 1999. The Stratton Corporation is primarily responsible for data collection, however, all results are submitted to Vermont Agency of Natural Resources in the form of an annual performance report.

Specific to Styles Brook, four sampling locations have been established for which sediment parameters and macroinvertebrates are to be monitored. Not every sampling location is monitored for all parameters, but each site is monitored for parameters specific for tracking progress of implementation measures.

In-stream measures of sediment load include the Pebble Count Procedure and Percent Embeddedness. Targets for each of these have been developed and annual monitoring results will track the progress of habitat improvement over the course of the implementation plan. Combined with the biomonitoring portion of the plan, compliance status with the Vermont Water Quality Standards will be tracked until conditions exist that can perpetuate continued compliance.

Implementation Plan

Strategies to Remediate Impairments

Several remediation measures were identified for water quality improvement primarily intended to reduce sedimentation to Styles Brook. All potential measures were ranked according to their overall impact for improving water quality and habitat condition. The ranking is based on field observations and measurements that consider relative benefit potential. A list of all proposed implementation measures is provided in the SWQRP, section 4.0.

Implementation Schedule

A complete schedule for implementation of remedial measures is given in the SWQRP, Section 5.0. Remediation measures for Styles Brook are expected to be completed by the end of 2000 and biocriteria standards for Class B waters are expected to be attained by 2005.

Reasonable Assurances

In waters impaired solely by nonpoint sources, reasonable assurances that implementation measures will be carried out are not required for a TMDL to be approved. However, EPA encourages states to provide reasonable assurances whenever possible that may include regulatory, non-regulatory, and or incentive-based measures. The TMDL for Styles Brook includes an extensive implementation plan aimed at restoring the stream to the acceptable numeric targets.

Since the SWQRP was developed as a permit requirement of the Vermont Act 250 land use and development control law, there is a strong incentive, and reasonable assurance, that the plan will be implemented. The primary land owner, Stratton Corporation, will be ineligible for future development permits outside of the scope of the remediation plan until the impaired waters, including Styles Brook, attain the Vermont Water Quality Standards. Implementation of remediation measures has begun in coordination with the VT-DEC.

Public Participation

As described previously, the SWQRP was developed through the Vermont Act 250 land use and development control permit process. As a part of that process, an extensive public participation process was involved. In EPA's initial comment letter of March 15, 2000 for the associated draft Tributary #1 TMDL, EPA stated that "EPA policy is that there must be full and meaningful public participation in the TMDL process." Vermont DEC believes that the public participation in the development of the Styles Brook TMDL as part of the Stratton Water Quality Remediation Plan more than satisfies this policy and meets all legal requirements.

The Stratton Water Quality Remediation plan was an outgrowth of the proceedings considering an application by the Stratton Corporation (Stratton) for a master plan permit for major development plans under Act 250. Vermont's Act 250 law is nationally acclaimed for its comprehensive and integrated approach to reviewing regional, economic, social and environmental impacts of major development projects. In effect for three decades, the law and its procedures are now an institution well known by all Vermonters with more than a passing interest in environmental issues. A surprising number of the state's residents can rattle off the Act's "10 Criteria" for reviewing projects. (See Appendix A for a description of the Act 250 Process and the 10 criteria).

Act 250 addresses the broader impacts from large scale development projects that are not covered by Department of Environmental Conservation's (DEC) discharge permit programs. For

example, the Act 250 Commission found that Stratton must address all the nonpoint source pollution associated with the proposed master plan, whether a DEC permit for a discharge is required or not. The Stratton Water Quality Remediation Plan was the mechanism adopted by the Commission for addressing nonpoint source pollution at Stratton. In addition, Act 250 regulators can supplement DEC requirements by imposing stricter conditions on discharges than those included in DEC discharge permits.

The Act 250 process is quasi-judicial in nature. Public notice of a permit application includes an invitation to become a party to the proceedings. As explained in the description (Appendix A), the applicant; the municipal planning commission; the municipality, represented by either the selectman, alderman, or trustees; the regional planning commission; and affected State agencies are, by law, parties to the proceedings. Adjoining property owners who have requested a hearing or appeared at the first hearing and other persons or groups found to be appropriate parties under Environmental Board's "Rule 14(B)" may also be admitted as parties. The criteria for gaining party status are broad. To become a party an individual or group must demonstrate that their interests are affected under any of the 10 criteria or show that their participation will materially assist Act 250 regulators by providing testimony, cross-examining witnesses, or offering argument or other evidence relevant to the 10 criteria.

The initial Act 250 public notice regarding Stratton's application for a master plan permit dated February 26, 1997 is also found in Appendix A. As a result of that notice the Stratton Area Citizen Committee (SAC), a local and vocal citizen group with long standing interest in water quality, and the Vermont Natural Resources Council (VRC), a statewide environmental organization with a special interest in water quality were both admitted as parties to the proceedings. Unlike citizens in the typical informational public hearing, parties in Act 250 proceedings may introduce evidence, present expert testimony, cross examine witnesses of other parties, file legal memorandum and proposed findings of fact, and seek administrative and judicial appeals of regulatory rulings.

To abbreviate a long story, as a result of water quality concerns raised by SAC, VRC and DEC the Act 250 district commission requested comments from DEC on how the commission should respond to Stratton's expansion plans in light of the fact that its existing developments were contributing to nonpoint source violations of state water quality standards. DEC's response was to suggest that Stratton be required to prepare and implement a water quality remediation plan with specific water quality improvement targets as a condition of going forward with new development projects.

On April 9, 1999 the district commission issued notice of a public hearing (Appendix A) "to review a specific plan for correcting impaired stream segments and achieving compliance with the Vermont Water Quality Standards." The commission also requested that DEC approve the plan and "set quantifiable benchmarks by which to judge the effectiveness of the remediation strategy." The development of the water quality remediation plan was a collaborative process involving DEC and Stratton and review by VNRC. The plan was presented for approval at a

public hearing before the Act 250 district commission. The plan was approved by the district commission along with a master plan permit. The plan also requires periodic public meetings to review implementation progress.

The water quality remediation plan is currently being implemented. VNRC appealed the district commission's master plan permit approval to the state Environmental Board on several grounds. VNRC's appeal is not directed at the water quality remediation plan's benchmarks although they are seeking that new development be postponed until waters are no longer impaired.

In summary, the Stratton Water Quality Remediation Plan was the result of more than two years of intense public hearings over water quality concerns. The hearings included ongoing input from local officials, state government, local citizens and statewide environmental interests.

It should be noted that the Clean Water Act does not require public participation in establishing TMDLs. The applicable EPA rules at 40 CFR 130.7(c)(1)(ii) read as follows:

"(ii) TMDLs shall be established for all pollutants preventing or expected to prevent attainment of water quality standards as identified pursuant to paragraph (b)(1) of this section. Calculations to establish TMDLs shall be subject to public review as defined in the State CPP."

The relevant portion of Vermont's current CPP reads as follows:

"The Department no longer centralizes the public participation implementation effort. Implementation is the responsibility of the program manager under policy direction and overview by the Commissioner. Each program manager is in a position to identify and insure participation in the decisions uniquely significant to his/her program and the involved public." (State of Vermont 1995 Continuing Water Quality Management Planning Process, p. 45)

In this case, it made no sense to initiate an independent and duplicative public notice and comment process on the TMDL given the extensive public involvement in the Act 250 master plan permit proceedings which lead to the development of the TMDL and govern its implementation.

The Stratton Water Quality Remediation Plan is a perfect example of using existing state regulatory mechanisms and their attendant public participation requirements to restore impaired waters. Public participation was fully consistent with the CPP and EPA rules. In fact, we doubt that many TMDL's nationally have undergone such a rigorous public process.

Finally, we note the following quotes from Secretary Browner's press release introducing EPA's new TMDL rules:

"Under the final program signed today, the U.S. Environmental Protection Agency would work in partnership with state and local governments to develop common sense, flexible solutions for cleaning up the 40 percent of U.S. waterways that presently do not meet the goals for public-health protection."

"States and local communities will have maximum flexibility to determine how best to meet cleanup goals by setting their own TMDL's, or total maximum daily loads."

"And it allows maximum flexibility for state and local governments to develop cleanup plans."

We believe that the public participation which led to the Stratton Water Quality Remediation Plan is a perfect example of the "common sense, flexible solution" to nonpoint source impaired waters that Secretary Browner is aiming for.

Appendix A

Act 250 Hearing Information and the 10 Criteria

Act 250 Notice Application and Hearing concerning
Stratton Master Plan and Water Quality Remediation Plan

STATE OF VERMONT
ENVIRONMENTAL BOARD - DISTRICT COMMISSIONS

ACT 250 - Hearing Information and the 10 Criteria

The following general information is provided to assist participants and observers at Act 250 hearings in following and understanding what is taking place. In all cases when specific information about Act 250 is required, you should refer to 10 V.S.A. Chapter 151 and the Environmental Board Rules.

The Act 250 hearing is conducted by a three-member District Environmental Commission. Each Commission also has two alternate Commissioners. The Commissioners are appointed by the Governor of the State of Vermont. Their responsibility is to consider evidence presented by legally designated parties and to evaluate each application for a subdivision or development permit in accordance with the ten criteria below. The so-called statutory parties are: the applicant; the municipal planning commission; the municipality, represented by either the selectman, alderman, or trustees; the regional planning commission; and affected State agencies. The District Commission may also grant party status to adjoining property owners who have requested a hearing or appeared at the first hearing and other persons or groups found to be appropriate parties under Environmental Board Rule 14(B). The District Coordinator's role is to assist the District Commission in the procedural aspects of the application review, as well as to provide advice to the applicant and the various parties.

In order for an adjoining property owner to be admitted as a party, the property owner or his representative must show how the proposed project will have a direct effect on his property in relation to the 10 criteria outlined below.

Individuals or organizations seeking party status under Environmental Board Rule 14 (B) must make their request on or before the first day of the hearing; must state the details of their interest in the proceedings, including whether their position is in support of or in opposition to the order sought, if known; must in the case of a petition by an organization, describe the organization, its membership and its purposes; and must show either (a) that the project may affect their interests under the 10 criteria, or (b) that their participation will materially assist the Commission in its review of the project by providing testimony or other evidence relevant to the 10 criteria.

10 CRITERIA

Before granting a permit, the District Commission must ensure that the development or subdivision meets the following criteria:

- (1) Will not result in undue water or air pollution.

This criterion deals with water and air pollution potential generally and such specific matters relating to water pollution as:

(A) Headwaters; (B) Waste disposal; (C) Water Conservation; (D) Floodways; (E) Streams; (F) Shorelines; and (G) Wetlands

streams, (F) shorelines, and (G) wetlands.

- (2) Has sufficient water available for the needs of the subdivision or development.
- (3) Will not unreasonably burden any existing water supply.
- (4) Will not cause unreasonable soil erosion or affect the capacity of the land to hold water.
- (5) Will not cause unreasonably dangerous or congested conditions with respect to highways or other means of transportation.
- (6) Will not create an unreasonable burden on the educational facilities of the municipality.
- (7) Will not create an unreasonable burden on the municipality in providing governmental services.
- (8) Will not have an undue adverse effect on aesthetics, scenic beauty, historic sites or natural area, and 8(A) will not imperil necessary wildlife habitat or endangered species in the immediate area.
- (9) Conforms with the Capability and Development Plan which includes the following considerations:
 - (A) The impact the project will have on the growth of the town or region;
 - (B) Primary agricultural soils;
 - (C) Forest and secondary agricultural soils;
 - (D) Earth resources;
 - (E) Extraction of earth resources;
 - (F) Energy Conservation;
 - (G) Private utility services;
 - (H) Costs of scattered developments;
 - (J) Public Utility services;
 - (K) Development affecting public investments; and
 - (L) Rural growth areas.
- (10) Is in conformance with any local or regional plan or capital facilities program.

The burden of proof is on the applicant for Criteria 1, 2, 3, 4, 9, and 10. The burden of proof is on the opposition for Criteria 5, 6, 7, 8, and often 9(A). A permit can be conditioned but not denied under Criteria 5, 6, and 7. Regardless of the burden of proof, the Commission must have enough information to make findings under all the criteria.

At the conclusion of the hearing, the District Commission will either adjourn the hearing or declare a recess sometimes to a latter date to allow additional information to be presented. If the hearing is adjourned, the Commission will issue a decision in the form of findings of fact and conclusions of law, and, if appropriate, a Land Use Permit, within twenty days.

Any of the parties may appeal a decision issued by the District Environmental Commission. The appeal from a District Commission is to the State Environmental Board. A decision of the Environmental Board may be appealed to the Vermont Supreme Court by the applicant, the State, the regional and municipal planning commission and the municipality.

Act 250 permits do not supersede or replace the requirements of other local or state permits. For additional information about Act 250 and its relationship to local or state land use laws, contact the Environmental Board, Montpelier, Vermont (802-828-3309) or the

Coordinator at any of these locations:

Environmental Comm.
Districts #1 & 8
440 Asa Bloomer Bldg.
Rutland, VT 05701-5903
(Tel. 786-5920)

Environmental Comm.
Districts #4, 6, and 9
111 West St.
Essex Jct., VT 05452
(Tel. 879-5614)

Environmental Comm.
District #7
1229 Portland St., Suite 201
St. Johnsbury, VT 05819
(Tel. 751-0120)

Environmental Comm.
Districts #2 and 3
100 Mineral Street, Suite 305
Springfield, VT 05150
(Tel. 885-8855)

Environmental Comm.
District #5
324 North Main Street
Barre, VT 05641
(Tel. 476-0185)

1-520

**ACT 250 NOTICE
APPLICATION AND HEARING
10 V.S.A., SECTIONS 6083-6086**

Notice is hereby given that on February 11, 1997, Application #2W0519-10 was filed by the Stratton Corporation, RR 1, Box 145, Stratton Mountain, VT 05155, pursuant to Environmental Board Rule 21 Order of Evidence - Partial Review, for a Master Plan for the Stratton Resort. The plan calls for 724 lodging rooms, restaurants, shops, a theater, redeveloped golf clubhouse and base lodge, ice skating rink, 574 additional housing units, 21 single-family estate lots, improved pedestrian and vehicular circulation, expansion to the Sports Center, including a large outdoor pool and other amenities. The project also calls for replacement of existing lifts with high speed technology and installation of additional lifts (total of 15 lifts at build-out), ski trail expansion of 220 acres all to have snowmaking, construction of 32,000 square feet of additional base lodge facilities in the Sun Bowl and renovations to the Village Base Lodge, construction of a new Welcome Center, and expanded day skier parking in the Sun Bowl and at the new Welcome Center. The project is located in the Towns of Stratton and Winhall.

Pursuant to is jurisdiction and authority under 10 V.S.A., Sections 6001(3) and 6085, the District Environmental Commission will hold a public hearing:

March 19, 1997 - Site Visit 9:00 a.m. - Meet at the Sun Bowl Base Lodge parking lot at Stratton Mountain and transportation to the site will be provided. The Hearing will be held immediately after the site visit at the Stratton Town Office.

The following people or organizations may participate in this hearing:

1. Statutory parties: The municipality, the municipal planning commission, the regional planning commission, any adjacent municipality, municipal planning commission or regional planning commission if the project lands are located on a town boundary, and affected state agencies.
2. Adjoining property owners: May participate to the extent the proposals will have a direct effect on their properties under the ten criteria.
3. Other persons or organizations: May participate pursuant to Environmental Board Rule 14(B) at the discretion of the District Environmental Commission.

If you wish further information regarding participation in this hearing, please contact the coordinator at the address below before the first hearing date. If you have a disability for which you are going to need accommodation, please notify this office at least seven days prior to the above hearing date.

Plans for this project are available for review at the municipal office, the regional planning and development commission, and the District Regional Office in North Springfield.

Prior to issuance of a land use permit for this project the District Environmental Commission must find that the project is in conformance with the ten criteria of 10 V.S.A., Section 6086(A) and that it is not detrimental to the public health, safety, and welfare.

Dated at North Springfield, Vermont on February 26, 1997.

By: 

April Hensel, District 2 Coordinator
RR 1, Box 33

No. Springfield, VT 05150 (Tel: 886-2215)

CERTIFICATE OF SERVICE

#2W0519-10

I, April Hensel, hereby certify that I sent a copy of the foregoing Hearing Notice on February 26, 1997, by U.S. Mail, postage prepaid, to the following:

The Stratton Corporation
Mr. Dana C. Severy
RR 1, Box 145
Stratton Mountain, VT 05155

Stratton Bd. of Selectmen
Albert Dupell
P.O. Box 146
W. Wardsboro, VT 05360

Stratton Town Planning
Rona Hicks
P.O. Box 166
W. Wardsboro, VT 05360

Windham Regional Commission
139 Main St., Suite 505
Brattleboro, VT 05301

Winhall Bd. of Selectmen
Theodor Friedman
P.O. Box 40A
Bondville, VT 05340

Winhall Town Planning
Marcel Gisquet
Bondville, VT 05340

Land Use Attorney
Agency of Natural Resources
103 South Main Street
Waterbury, VT 05676

FOR INFORMATION ONLY

District 2 Environmental Commission
RR #1, Box 33
North Springfield, VT 05150

Stratton Town Clerk
Patricia F. Coolidge
P.O. Box 166
W. Wardsboro, VT 05360

Winhall Town Clerk, Ms. Marion Jenks
Box 19A
Bondville, VT 05340

Stuart Slote
Public Service Department
State Office Building
Montpelier, VT 05602

James McMenemy
District Fisheries Biologist
RR #1, Box 33
No. Springfield, VT 05150

Forrest Hammond
District Wildlife Biologist
RR #1, Box 33
No. Springfield, VT 05150

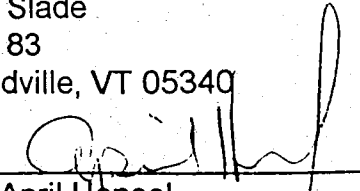
Jay Maciejowski
District Forestry Manager
RR #1, Box 33
No. Springfield, VT 05150

Ms. Sue Wolters
Office of Administration
109 State Street
Montpelier, VT 05609

M. Audrey Campbell
David W. Campbell
P. O. Box 186
Blackcherry Ridge Road
Bondville, VT 05340

Joyce Ameden
P. O. Box 32
Bondville, VT 05340

Will Slade
Box 83
Bondville, VT 05340

By: 
April Hensel
District 2 Coordinator

**STATE OF VERMONT
ENVIRONMENTAL BOARD
DISTRICT ENVIRONMENTAL COMMISSION #2**

RE: The Stratton Corporation
RR 1, Box 145
Stratton Mountain, VT 05155

Hearing Recess Order #2W0519-10
and Notice of Hearing
Stratton Master Plan
10 V.S.A., §§ 6001 - 6092 (Act 250)

We have reviewed all filings by the parties with respect to the above-referenced project. As a result of our review and deliberation, we have decided that in order to determine whether the project complies with Criterion 1 and the Vermont Water Quality Standards it is essential for us to review a specific plan for correcting impaired stream segments and achieving compliance with the Vermont Water Quality Standards. The plan will need to incorporate the points outlined in the February 1, 1999 Memorandum submitted by the Agency of Natural Resources, entitled "Agency of Natural Resources' Response to July 16, 1998 Recess Memorandum." Prior to submission of the plan to the District Environmental Commission and the parties, we request that the Agency of Natural Resources review and approve the plan and set quantifiable benchmarks by which to judge the effectiveness of the remediation strategy. These quantifiable benchmarks of improved water quality, in turn, should be linked with a development timetable which allows for incremental build-out of the master plan. Such a plan will allow for greater certainty with respect to conformance with the Vermont Water Quality Regulations within a specified time period.

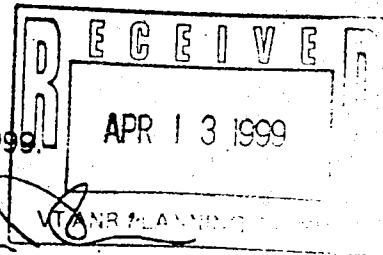
We request that the Agency of Natural Resources complete its review of the plan and establishment of benchmarks no later than May 17, 1999. The Applicant will provide copies of the plan and benchmarks to the District Environmental Commission and all parties immediately thereafter. A hearing on the plan shall be held:

Date: June 1, 1999
Time: 9:30 a.m.
Place: Stratton Gold Card Room

Dated at Springfield, Vermont on April 9, 1999.

By: 

Thomas S. Durkin, Chairman
District 2 Environmental Commission
Environmental Board



Others participating in this decision:

Susan S. Spaulding

CERTIFICATE OF SERVICE

#2W0519-10

I hereby certify that I sent a copy of the foregoing Hearing Recess Order and Notice of Hearing on April 9, 1999, by U.S. Mail, postage prepaid, to the following:

The Stratton Corporation
Mr. Justin Smart, V.P.
RR 1, Box 145
Stratton Mountain, VT 05155

Stratton Bd. of Selectmen
Albert Dupell
P.O. Box 146
W. Wardsboro, VT 05360

Stratton Town Planning
Rona Hicks
P.O. Box 166
W. Wardsboro, VT 05360

Windham Regional Commission
139 Main St., Suite 505
Brattleboro, VT 05301

Winhall Bd. of Selectmen
Theodor Friedman
P.O. Box 420
Bondville, VT 05340

Winhall Town Planning
Marcel Gisquet
P.O. Box 372
Bondville, VT 05340

Lawrin Crispe, Esq.
Crispe & Crispe
114 Main Street
Brattleboro, VT 05301

Bennington County Reg. Commission
Rt. 7A, P.O. Box 342
Bondville, VT 05340

Will Slade
Box 83
Bondville, VT 05340

Peter Strong
So. VT Conservation Society
P. O. Box 117
Bondville, VT 05340

Margareta White
Lower Taylor Hill Road
Winhall, VT 05340

Helen K. & J. Robert Vail
RR 1, Box 349A
Jamaica, VT 05343

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P. O. Box 129
Bondville, VT 05340

M. Audrey Campbell
P. O. Box 186
Bondville, VT 05340

Paul Schwippert
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W. Wardsboro, VT 05360

Darlene Palola
Stratton Area Citizens Committee
RD 1, Box 347
Jamaica, VT 05343

Andrew MacLean, Esq.
Wilson and White
P. O. Box 159
Montpelier, VT 05601-0159

Stephen Reynes, Esq.
P. O. Box 159
Montpelier, VT 05601-0159

Ellis Speath
RR 1, Box 2501
Manchester Center, VT 05255

Larry A. Wohler
P. O. Box 367
Stratton Mtn., VT 05155

Penny Wu
USDA Forest Service
RR #1, Box 1940
Manchester Center, VT 05255

Ray Hawksley
Box 341
Jamaica, VT 05343

Chapel of the Snows and Chalet Apts.
c/o Rick Hube
Box 301
Bondville, VT 05340

John Lingley
Box 197
Bondville, VT 05340

Joyce Ameden
P. O. Box 32
Bondville, VT 05340

Stratton/Winhall Fire District
William Simmers
P. O. 617
Stratton, VT 05155

A. Jay Kenlan, Esq.
P.O. Box 578
Rutland, VT 05702

Lifeline Lodge
Lift Dev. Corp.
63 Commercial Ave.
Garden City, NY 11530

Julie Spurling
Vermont Natural Resources Council
P. O. Box 744
Manchester Village, VT 05254

Christopher Kilian, Esq.
VT Natural Res. Council
9 Bailey Avenue
Montpelier, VT 05602

Peter Keibel
Water Quality
103 So. Main St., 10 No.
Waterbury, VT 05676

Londonderry Rescue Squad
P.O. Box 911
Londonderry, VT 05148

Richard and Susan Pallan
13 Norwood Street
Winchester, MA 01890

Jon Groveman
Land Use Attorney
Agency of Natural Resources
103 South Main Street
Waterbury, VT 05676

FOR INFORMATION ONLY

District 2 Environmental Commission
100 Mineral Street, Suite 305
Springfield, VT 05156

Stratton Town Clerk
Patricia F. Coolidge
P.O. Box 166
W. Wardsboro, VT 05360

Winhall Town Clerk
Ms. Marion Jenks
Box 389
Bondville, VT 05340

M. Audrey & David W. Campbell
P. O. Box 186
Blackcherry Ridge Road
Bondville, VT 05340

Daniel Maxon
DEC - Water Quality
103 So. Main St./10 North
Waterbury, VT 05676

Brian Fitzgerald
DEC - Air Pollution
103 So. Main St./2 South
Waterbury, VT 05676

William Groht
P.O. Bx 384
Bondville, VT 05340

Susan Smallheer
c/o Rutland Herald
56 Main Street/Suite 202
Springfield, VT 05156

Stratton Mountain Inn, C.O.A.
c/o Tom Churma
Stratton Mountain, VT 05155

Alan Fisher
c/o Emergency Medical District 3
Box 614
Stratton Mountain, VT 05155

Green Mountain Club
RR 1, Box 650
Waterbury Center, VT 05677

William Cobb
RR 1, Box 198
So. Londonderry, VT 05155

Jamaica Planning Commission
Tom Torregrossa
P.O. Box 200
Jamaica, VT 05343

Jamaica Selectboard
Mr. Bruce Chapin, Chrm.
RR 1, Box 10
Jamaica, VT 05343

Jon Mathewson
c/o Manchester Journal
P.O. Box 569
Manchester Ctr., VT 05255

Russell J. Vanacek, DDS
111 Dean Drive
Tenafly, NJ 07670

John Newton
RR 1, Box 240
Londonderry, VT 05148

Lois Beardwood
P.O. Box 381
Stratton Mountain, VT 05155

By: 

April Hensel
District 2 Coordinator