State of Vermont
WATER RESOURCES BOARD

Re: Killington Ltd.
Docket No. WQC-97-10
§401 Water Quality Certification
August 14, 1998

Woodward Reservoir Project
Killington/Pico Interconnect Project

DECISION AND CERTIFICATION

This §401 Certification is issued based upon the Findings of Fact, Conclusions of Law, and Order issued by the Water Resources Board ("Board") on August 14, 1998; with respect only to those italicized statements or conditions contained herein, the Certification is based upon review and Certification by the ANR in its November 21, 1997 §401 Certification. The italics denote that the statement or condition was not reviewed by the Board because the subject matter of the issue addressed therein was beyond the scope of the Board's review in this case and, therefore, outside the Board's jurisdiction in its capacity as a quasi-judicial Board providing *de novo* appellate review.

Based on its review and findings, the Board concludes that there is reasonable assurance that construction and operation of the withdrawals at Woodward Reservoir in Plymouth and Reservoir Brook at West Bridgewater and the resulting use of water of Reservoir Brook for snowmaking; modification of the withdrawals on the Ottauquechee River, Roaring Brook and Falls Brook; *and construction of the ski lifts and trails associated with the Killington/Pico interconnect,* when done in accordance with the following conditions will not violate applicable water quality standards; will not have a significant impact on use of the affected waters by aquatic biota, fish or wildlife, including their growth, reproduction, and habitat; will not impair the viability of the existing populations; will not result in a significant degradation of any use of the waters for recreation, fishing, or other legitimate uses that depend directly on the existing level of water quality; and will be in compliance with sections 301, 302, 303, 306, and 307 of the Federal Clean Water Act, 33 U.S.C. §1341, and other appropriate requirements of state law including the State Water Quality Policy, 10 V.S.A. §1250, and Chapter 16 of the ANR's Environmental Protection Rules concerning Water Withdrawals for Snowmaking.

CONDITIONS

A. The applicant shall construct, operate, and maintain this project as set forth in its application and pursuant to the findings of fact and conclusions of law dated August 14, 1998 and with the following conditions.

Conservation Flow Conditions

B. The applicant shall maintain minimum conservation flows in accordance with the following table. No withdrawals shall occur during periods when these source streams are flowing at less than these minimum flow rates.

Table C-l: Conservation **Flow** Standards

Source	Conservation Flow (csm)[1]	
	1998-1999	1999-2000 and beyond
Roaring Brook	0.80	0.80
Falls Brook	0.80	0.80
Falls Brook tributary	0.80	0.80
Ottauquechee River	0.98	0.98
Reservoir Brook (Woodward Reservoir)	0.80	0.80
Reservoir Brook at West Bridgewater	1.50	0.80

[1]Or instantaneous inflow if less than the conservation flow standard specified in this table, except for Reservoir Brook (Woodward Reservoir), which has a guaranteed flow of 0.80 csm until March 15. On and after March 15 in the Reservoir Brook (Woodward Reservoir), the requirement is instantaneous inflow, if less than 0.80 cm.

At the Reservoir Brook intake, the applicant shall not withdraw any greater than 50 percent of the portion of river flow between 0.80 csm and 1.4 csm from October 1 to November 30 and 50 percent of the portion of river flow between 0.80 csm and 1.1 csm from December 1 to March 3 1. Any portion of the river flow above the 1.4 csm or the 1. 1 csm may be withdrawn up to a total diversion rate equal to the proposed installed pump capacity.

C. After the tenth year of flow recording at the diversions on Woodward Reservoir, Reservoir Brook at West Bridgewater, Falls Brook, and Roaring Brook, the site-specific

February median flow shall be determined, subject to Department of Environmental Conservation ("DEC") approval, and that value, if higher than 0.80 csm, shall become the minimum conservation flow for those sources. If the revised February median flow is less than 0.80 csm, then the applicant may request a permit amendment to reduce the flow standard, subject to a demonstration of water need in accordance with Section 16-05 (Alternatives Analysis) of the Snowmaking Rules and any other currently applicable regulations in place.

D. The applicant shall update the snowmaking alternatives analysis and file the updated analysis with the DEC at intervals of 10 years or less, calculated from the date of issuance of this Certification.

Woodward Reservoir Water Level Management

E. Killington shall manage the water level at Woodward Reservoir such that drawdown during the period November through April does not exceed the magnitude and frequency specified below.

Table C-Z: Frequency and magnitude of drawdowns

Maximum Drawdown Range in feet	Maximum Number of Years during 15 year term of Certification
Not more than 12.0	2
Not more than 10.0	4
Not more than 8.0	6
Not more than 6.0	8
Not more than 4.0	12
Not more than 2.0	15

Use for snowmaking shall not cause the Reservoir to drop more than 12.0 feet below the crest of the principal spillway.

F. In order to minimize the magnitude of the winter drawdown, the applicant shall assign a higher use priority to its other water sources, relative to Woodward Reservoir. Other stream and reservoir sources shall be used to the extent feasible, given conservation flow requirements and pumping limitations, before Woodward Reservoir is used.

G. Snowmaking water withdrawals from Woodward Reservoir shall not commence prior to November 1. The applicant shall be responsible for Reservoir management and maintenance of downstream conservation flows beginning November 1 each year and ending with the completion of the refill. Each year, the applicant shall notify the DEC of the refill completion date within one week of that date.

H. The applicant shall develop a refill management plan and the applicant shall consistently complete the refill before the onset of smelt spawning. The plan shall be subject to DEC approval prior to the inception of snowmaking water use. For the purposes of the initial management plan, the refill target date is April 23. The DEC may require the applicant to revise the management plan, including use of a new refill target date, if evidence indicates that smelt spawning occurs before April 23 and is being impaired by the existing refill schedule or if operation under the management plan is failing to meet the refill date requirement. The applicant may request the DEC to establish a later refill date if studies demonstrate that smelt spawning regularly occurs later in the spring and other uses and values of the Reservoir would not be impaired by a later refill completion date.

Flow Monitoring

I. For all stream sources, the applicant shall design and install gaging and metering systems adequate to meet the compliance record keeping requirements of Condition K below.

J. The applicant shall continue the existing gaging system for the Ottauquechee River (Gondola) intake, which utilizes data from the U.S. Geological Survey Ottauquechee River gage (Gage No. 01150900). If the applicant elects to change to an alternate gaging system, the system shall be subject to DEC approval.

K. For each day that the diversion of water occurs at each withdrawal location, hourly rates of diversion, daily maximum diversion rates, and total daily volumes with daily average rates; minimum instantaneous below-diversion flows and corresponding natural stream flows; hourly Reservoir levels; and hourly and daily average natural flows shall be recorded. For days during the fall/winter period when no diversion occurs, only daily average flow data must be recorded.

L. At all withdrawal locations, civil and hydraulic works designs and instrumentation specifications for flow and water use monitoring shall be reviewed and certified by a registered professional engineer as consistent with the approved conservation flow standards. A copy of the engineer's certification, along with the basis of design and equipment specifications, shall be provided to the DEC prior to the start of construction,

The final design shall be subject to DEC approval prior to initial operation.

M. Technicians who collect and maintain records shall be trained by a registered professional engineer. Calibration of the gages and measurement devices shall be done under the supervision of a registered professional engineer or approved by the same. The gages shall be rated prior to the first season of use, and the rating measurements analysis tiled with the DEC. Rating measurements shall be repeated as necessary in subsequent years to account for any changes in the gage control characteristics, due to scour, sedimentation or other cause. A second set of rating measurements shall be taken before the second season to determine general stability of the rating; the rating information and a brief comparison report shall be filed with the DEC before the start of that season.

System Maintenance

N. If the gage stations or flow devices are malfunctioning, or are not functioning because of lack of power or for any other reason, diversion of flow shall be discontinued until the malfunctions or non-functioning has been corrected. The DEC shall be notified within 24 hours of any malfunctioning or non-functioning.

0. The applicant shall daily monitor the condition of the flow diversion devices and maintain them free of debris and ice. A daily log shall be maintained noting work that is performed to keep the systems functioning as designed. Chronic problems shall be brought to the attention of the DEC, and alternatives to correct the problems proposed for approval and implementation.

P. Each fall before the diversion of water from Reservoir Brook, Falls Brook or Roaring Brook for snowmaking, the flume and intake spillway shall be surveyed by a registered land surveyor or registered professional engineer to confirm that the elevations have not shifted due to soil movement, high water damage, or any other cause. The results of the survey shall be tiled with the DEC before snowmaking recommences. The survey requirement may be suspended by the DEC if, after three years of measurement, the structures are found to be stable. If a structure is damaged due to flood or other causes, the structure shall be resurveyed and the results riled with the DEC prior to recommencing withdrawal of water.

Reporting Requirements

Q. Stream flow data shall be provided to the DEC in table form and in whatever machine-readable format the DEC requires. For each of the months of October through March, within 21 days of the end of the month, a report shall be filed with the DEC, including the data specified above and a narrative description of flow and

water use conditions throughout the month, as well as any operational problems encountered or corrective actions taken.

R. When the system becomes operational, the applicant shall file annually with the DEC, by July 1 following, a report which includes the daily pumping rates and volumes (each source); seasonal water withdrawal (each source); trail coverage; compliance with existing conservation flow requirements; available data on stream flow, temperature, and snowfall; known expansion plans; and projections on future water use.

Class Two Wetland

S. The applicant shah tile a monitoring plan subject to DEC approval for ongoing monitoring of the condition of the Class Two wetland at Woodward Reservoir to identify whether the changed winter ice conditions and wetland hydrology cause any damage to the peat mat and its ecological values. If such damage is reported, the applicant shall propose a plan to the DEC to remediate such damage and shall work with the DEC to avoid further damage.

Ice Safety

T. The applicant shall measure ice thickness in the area of the intake during the first winter that the drawdown exceeds six feet to determine if ice thickness is affected by the withdrawal. Measurements shall be taken weekly beginning in the first week that the leveldrops below minus six feet and shah be taken over the intake and at ten foot intervals parallel to the shoreline in either direction until a consistent ice thickness is found. A report of the results shall be filed with the DEC, with recommendations relative to the need for cautionary signs or other safety measures, by July 1 following. The DEC may direct the applicant to continue to monitor the ice thickness in subsequent years and/or to implement safety measures.

Stream Diversions

U. The inflatable dam at the Reservoir Brook diversion weir shah be inflated no earlier than November 15, nor later than April 1. The applicant shall be responsible for assuring that the weir sill does not impede fish movement during the period the dam is not inflated. This issue and the potential effect of backwater on the Parshall flume should be taken into consideration in the final design. The final design of the diversion is subject to DEC approval before the start of construction.

V. *The Roaring Brook diversion shall be designed to maintain natural flows downstream during periods when Snowshed Reservoir is filled to capacity The Falls Brook diversion*

shall be designed to maintain natural flows downstream duringperiods when Bear Mountain Reservoir is filled to capacity, The final design of these diversions is subject to DEC approval before the start of construction.

Erosion and Sediment Control

W. The Water Quality Division shall be notified at least 48 hours in advance of the start of construction for each of the water sources and each phase of the lift/trail work and shall be provided with an updated construction schedule annually before the start of the construction season. The Division shall also be notified of construction completion no more than one week after the completion at each water source and each interconnect phase. The applicant shall arrange a final inspection of the sites annually in the fall for the purpose of reviewing permanent erosion control features, earthwork conditions, and consistency of the work within and along the streams with the approved designs.

X. All instream work, including the intake and diversion structures at Reservoir Brook, Roaring Brook and Falls Brook and all pipeline stream crossings, shall be undertaken and completed between June 1 (July 15 for stream crossings above elevation 2500 feet) and September 15, unless an extension is granted by the DEC following a written request.

Y. Construction of the Woodward Reservoir intake shall be completed during the winter drawdown period; the current drawdown and refill timing shall not be altered to facilitate construction.

Z. *For any logging or construction within 100 feet of any streams, buffer strip boundaries shall be fenced or otherwise clearly marked to prevent disturbance. In the 70-foot buffer zone along Roaring Brook where sewerline work has already necessitated disturbance, that* area *shall be fenced and allowed to revegetate; indigenous plantings shall be placed in this area to hasten restoration.*

AA. The DEC shall retain jurisdiction over erosion and sediment control during the construction period and may at any time require additional remedial or preventative measures to protect water quality, including changes in the construction schedule or extent of work underway at any given time.

BB. The *applicant shall develop a turbidity monitoring plan for the brooks affected by construction of the Killington/Pico interconnect, The plan shall be submitted to the DEC for approval at least 60 days prior to commencement of construction.*

CC. The applicant shall fund the oversight services of an independent civil engineer acting

under the direction of the DEC to monitor construction and implementation of erosion control practices, including protection of vegetated stream buffers. The applicant must file for DEC approval a proposal for oversight activities (including phases of construction to be monitored, frequency of visits, authority of engineer, and reporting formats). The applicant shall file for DEC approval a proposal for periodic submittal of reports on construction activity and progress through the construction period.

Final Designs for Intakes and Pipeline Crossings: Revegetation/Landscaping Plans

DD. Final designs of all intakes, the pipeline crossings on Reservoir and Madden Brooks, andthe interconnect trail and road stream crossings shall be submitted to the DEC at least 30 days prior to construction and are subject to DEC approval before start of work. Plans shall show the limits of disturbance at each site. The two intakes at Woodward Reservoir and on Reservoir Brook shall be designed to minimize fish entrainment; maximum clear spacing for racks or screens shall be 1 .O inch. For the intake at Woodward Reservoir, the filing shall include design information on the main pipeline from the intake box to the west side of Route 100, and downstream to a point at or below the toe of the dam where proper filter drainage can be achieved; the pipeline shall be designed to control the potential for seepage along the outside of the pipe. The plans for the Madden Brook crossing shall include a profile of the streambed showing bed, the trench cross section, and the highway culvert inlet invert.

EE. Planting plans for all intakes and stream crossings shall be filed with the DEC for approval within 60 days of the date of this certification. The plan shall be implemented as soon as practicable after construction completion.

As-Built Plans

FF. Before the initial diversion of water at Woodward Reservoir and Reservoir Brook and at the modified Roaring Brook and Falls Brook sites, the applicant shall tile as-built plans for the diversion structures and intakes with the DEC.

General Conditions

GG. The applicant shall insure that every reasonable precaution is taken during construction to prevent the discharge of petrochemicals, wet concrete and debris into State waters.

HI-I. Debris associated with project construction and operation shall be disposed of properly.

II. Any proposal to desilt the intakes shall be subject to prior review and written approval by the DEC.

JJ. Any change to the project that would have a significant or material effect on the findings, conclusions, or conditions of this certification, including project operation, must be submitted to the DEC for prior review and written approval.

KK. The applicant shall allow public access to the project area for utilization of public resources, subject to reasonable safety and liability limitations.

LL. The applicant shall allow the DEC to inspect the project area at any time to monitor compliance with certification conditions.

MM The DEC shall maintain continuing jurisdiction over the interconnect construction. The Board returns jurisdiction over the Woodward Reservoir Project and the associated snowmaking system withdrawals to DEC. DEC may modify the conditions of this certification as necessary to ensure future compliance with the VWQS and other appropriate requirements of state law addressed herein.

NN. This water quality certification is limited to the use of these public waters solely for the purposes of making snow and fighting tires. If water is proposed to be withdrawn for any other purpose, prior approval is required.

OO. This water quality certification shall expire on September 30, 2013. An application for renewal, if one is sought, shall be tiled with the DEC not later than November 30, 2012.

Dated at Montpelier, Vermont on this 14" day of August, 1998.

WATER RESOURCES BOARD
by its Chair

S/

William Boyd Davies

Concurring:
-Ruth Einstein
Jane Potvin
Gail Osherenko
Gerry Gossens

State of Vermont
WATER RESOURCES BOARD

FINDINGS OF FACT, CONCLUSIONS OF LAW, AND ORDER

RE: **Killington Ltd.**
Killington Road
Killington, Vermont 05751

Docket No. WQC-97-10
(Appeal of ANR's issuance of §401 Water Quality Certificate)
and
Docket No. MLP-97-09
(Appeal of ANR's issuance of Lakes and Ponds Permit #97-26)

This decision pertains to appeals from two independent actions of the Secretary of the Agency of Natural Resources ("ANR"): (i) the issuance of Management of Lakes and Ponds Permit #97-26 ("Encroachment Permit") to Killington, Ltd. ("Killington" or "the Applicant") on November **21, 1997;** and (ii) the issuance of a §401 Water Quality Certification ("$401 Certification") to Killington on November 21, 1997. ANR issued the Encroachment Permit pursuant to **29** V.S.A. §405(b). ANR issued the §401 **Certification pursuant** to 10 V.S.A. §1004 and 33 U.S.C. $1341 (§401 of the federal Clean Water Act (" CWA")).

As discussed herein, the Water Resources Board ("Board") concludes: (i) that the Encroachment Permit which was stayed as a consequence of a timely appeal shall be affirmed and reinstated with slight modifications to Conditions 8, 15, and 24, and the deletion of Condition 26; and (ii) that the §40 1 Certification issued by ANR shall be vacated and superseded by the §401 Water Quality Certification attached to this Findings of Fact, Conclusions of Law, and Order ("Decision"). Where sections of the attached §401 Certification contain italicized text, those sections are being incorporated verbatim from the §401 Certification on appeal. As discussed below in Section III., those sections addressed matters beyond the Board's scope of review and, as such, are left undisturbed by the Board's Decision,

I. PROCEDURAL HISTORY AND JURISDICTIONAL STATEMENT

On December 1, 1997, Nicholas J. Lenge tiled an appeal with the Board of the Encroachment Permit pursuant to 10 V.S.A. §406(a) ("MLP Appeal"). The following persons, in addition to Mr. Lenge, joined in the MLP Appeal: Thomas and Valerie Hickey, Joseph E. Calabrese, Thomas J. Calabrese, Lucas Krupywnckuj and Allison Peck, Gilford and Shirley Richardson, Jonathon and Paula Tucker, Paul M. Dorr and

Christene M. Baranowski, William and Janice Nacel, John Tidd' and George and Patricia Hodgdon (hereinafter called the "MLP Appellants"). The Board docketed the MLP Appeal as MLP-97-09.

On December 5, 1997, Nicholas J. Lenge, Joseph E. Calabrese, Thomas J. Calabrese, and Lucas Krupywnckuj ("§401 Appellants") filed an appeal pursuant to 10 V.S.A. §1024 seeking review of the §401 Certification ("$401 Appeal"). The Board docketed the §401Appeal as WQC-97-10.

On December 19, 1997, Board Chair, William Boyd Davies, convened a prehearing conference relative to the MLP Appeal, On December 24, 1997, Chair Davies issued a Memorandum to Parties regarding dates for filing of memoranda concerning party status and the scope of issues on appeal relative to the MLP Appeal. In response to the Chair's request regarding the MLP Appeal, on January 5, 1998, Appellants tiled, a Memorandum in Support of Party Status; on January 6, 1998, Killington filed an Objection to Appellants' Notice of Appeal; and on January 12, 1998, Appellants filed a response to Killington's Objection to Notice of Appeal and Killington filed a response to Appellants' Memorandum in Support of Party Status.

On January 22, 1998, Chair Davies convened an initial prehearing conference in the §401 Appeal, and a second prehearing conference in the MLP Appeal.' A portion of the January 22, 1998 prehearing conference was a combined conference relative to both of the above-captioned cases. On or before the January 22, 1998 prehearing conference, all persons or entities which had prepared party status requests with respect to either case submitted these to the Board. In addition, certain parties who chose to intervene as of right in the §401 Appeal participated in the prehearing conference and submitted their entries of appearance. At the prehearing conference, Chair Davies set forth several filing deadlines relative to the §401 Appeal which allowed the 5401 Appellants additional time in which to: state what they maintained to be the relevant issues under consideration; clarify who was seeking party status; and suggest any other requirements of state law that should be considered "appropriate" for consideration by the Board pursuant to §401(d) of the CWA in the §401 Appeal. Other parties in the §401 Appeal were allowed to respond

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1 Mr. Tidd later declined to seek party status in the MLP proceeding.

2 Also on January 22, 1998, Environmental Board Chair, Marcy Harding, convened a preheating conference concerning the Act 250 appeal of Land Use Permit Amendment #1R0813-5. The Act 250 appeal involves substantially the same parties as those identified in the above-captioned proceedings. The Act 250 proceeding followed an independent filing schedule and the merits hearing was held on July 7, 1998.

by a date certain. Provision was made for brief oral argument on these issues if requested by any party.

On February 10, 1998, the Board issued a Memorandum of Decision with respect to the MLP Appeal concerning the party standing and scope of appeal issues ("February 10, 1998 MOD"). On February 18, 1998, Killington filed a Motion to Alter seeking clarification of the scope of public good factors which were in issue. Appellants filed a timely Response to Motion to Alter on February 27, 1998. The full Board deliberated with respect to the Motion to Alter on March 10, 1998 and on March 20, 1998, issued a Memorandum of Decision with final rulings on party standing and the scope of appeal in **the** MLP Appeal ("March 20, 1998 MOD"). The Parties in the MLP Appeal are as follows:

MLP Appellants, by Paul Gillies, Esq. and Stephanie Kaplan, Esq.
ANR; by Andrew Raubvogel, Esq.
the Farm and Wilderness Foundation, Inc. ("Farm and Wilderness") by Rob Woolmington, Esq.; and
Killington, by A. Jay Kenlan, Esq., Edward V. Schwiebert, Esq., and Jim Caffry, Esq.

On January 26, 1998, counsel for the MLP Appellants and the §401 Appellants filed a Motion to Consolidate Hearings. Chair Davies issued a ruling on February 23, 1998 granting the consolidation request emphasizing that the consolidation of the appeals was only with respect to filing schedules and a coordinated presentation of evidence. Such consolidation, as was noted in the February 23, 1998 Order, does not merge the above-captioned appeals into a single cause, or change the rights of the parties, or make the parties in the MLP Appeal parties in the §401 Appeal, or vice-versa.

On February 23, 1998, Chair Davies issued Rulings on Party Standing relative to the §401 Appeal and issued corrections to certain filing deadlines. Only one objection to the party standing determinations in the §401 Appeal was noted. As noted at footnote 4, below, the denial of intervenors William and Debra Belangers' party status was affirmed by the full Board; accordingly, the Chair's rulings on party status govern this proceeding. The parties in the §401 Appeal are as follows:

§401 Appellants, by Paul Gillies, Esq. and Stephanie Kaplan, Esq.;
Thomas and Valerie Hickey; Allison Peck; Gilford and Shirley Richardson; Jonathon and Paula Tucker; George and Patricia Hodgdon;

and William and Janice Nacel[3] ("§401 Intervenors"), by Paul Gillies and
and Stephanie Kaplan, Esq.;
ANR, by Andrew Raubvogel, Esq.;
Farm and Wilderness, by Rob Woolmington, Esq.;
Killington, by A. Jay Kenlan, Esq., Edward V. Schwiebert, Esq. and
Jim Caffry, Esq.; and
Henry B. and Cheryl Shipman, pro se

On March 2, 1998, the Vermont Natural Resources Council ("VNRC") tiled a Petition for Status as an *Amicus* Curiae. On March 9, 1998, the Vermont Ski Areas Association ("VSAA") filed a Motion for Leave to Intervene as *Amicus Curiae* relative to the §401 Appeal.

Numerous filings were received by the Board with respect to the scope of review and appropriate state law issues in the §401 Appeal, at least one of which sought oral argument on these issues. Accordingly, on March 10, 1998, the Board heard oral arguments. Immediately thereafter, the Board deliberated with respect to the issues. On March 30, 1998, the Board issued a Memorandum of Decision on the Scope of Review and Other Appropriate Requirements of State Law relative to the 401 Appeal ("March 30, 1998 MOD").[4] In essence; the March 30, 1998 MOD limited the scope of the Board's review to issues associated with the Woodward Reservoir Project and its Associated Waterbodies. See, March 30, 1998 MOD.

On April 7, 1998, Chair Davies issued a Prehearing Conference Report and Order relative to both the MLP Appeal and the §401 Appeal. In addition to setting forth a schedule for the proceeding and filing deadlines for the prefiling of testimony, the Preheating Order granted both VNRC and VSAA leave to intervene as *amicus curiae.*[5]

On April 14, 1998, Appellants filed a Motion to Alter and ANR filed a Motion for Clarification, both relative to the Board's March 30, 1998 MOD. Also on April 14, 1998,

[3] Barry and Lyme Lawson were initially granted party status but later sought withdrawal as Appellants in both of the referenced matters. The request for withdrawal was granted on April 17, 1998.

[4] The March 30, 1998 MOD also included a ruling by the Board affirming the Chair's Ruling of February 23, 1998 declining to grant William and Debra Belanger party status in the §401 Appeal.

[5] Neither VNRC nor VSAA actively participated in this proceeding and neither filed legal memoranda on the issues in dispute.

Appellants filed a Motion to Continue the proceeding. On April 16, 1998, Killington filed an objection to the Prehearing Conference Report and Order objecting to the participation of VNRC as *amicus curiae*. The Board considered the parties written filings on the Motion to Alter and the Motion for Clarification, and on May 20, 1998 issued a Memorandum of Decision on the Scope of Review and Other Appropriate Requirements of State Law with limited clarifications on the appropriate requirements of state law that would be considered, and a denial of the Motion to Alter with respect to the scope of review. See, May 20, 1998 MOD. In addition, the Board denied Appellants' April 14, 1998 Motion to Continue, and overruled Killington's objection to VNRC's status as an *amicus*.

On May 28, 1998, Chair Davies conducted an additional prehearing conference relative to both of the referenced matters, The parties discussed a proposed site visit protocol as well as the schedule and time limitations for the hearing. In addition, Chair Davies reviewed the parties' objections to pre-filed testimony. Chair Davies provided initial guidance to the parties informing them how the numerous objections would be handled and providing an oral summary of how different categories of objections would be ruled upon. Parties were informed that Board staff would prepare a draft ruling on each of the objections consistent with Chair Davies' oral summary at the May 28, 1998 prehearing conference. The Chair's draft rulings were made available to parties on the following day. The Chair's final rulings were issued at the site visit.

At the outset of the merits hearing on June 2, 1998, the Board reviewed each of the Chair's rulings to which any party objected and sought full Board review. Brief arguments were heard with respect to these objections and the Board deliberated immediately thereafter. The Board affirmed each of the Chair's evidentiary rulings with slight modifications to clarify certain rulings. The Board incorporates herein by reference the Chair's Preliminary Rulings on the Parties' Objections to Prefiled Testimony, as amended on the record at the outset of the hearing.

II. PROJECT DESCRIPTION

The activity that is addressed by the Encroachment Permit is Killington's request for authorization to install a water intake system in the public waters of Woodward Reservoir in Plymouth, Vermont, principally to withdraw water for snowmaking and also to facilitate firefighting by installing a dry hydrant. Although the effects of such an authorization will extend beyond the shoreline of Woodward Reservoir, for purposes of these decisions, Killington's proposal to withdraw water directly from Woodward Reservoir and downstream from the Reservoir Brook will be referred to as the "Woodward Reservoir Project."

Killington also seeks authorization to construct new ski lifts and trails between existing Killington ski terrain in the area known as "Rams Head" and the Pico Peak ski area ("the Interconnect Project, "). While any additional snowmaking resources made available to Killington are proposed to serve both Killington's existing ski trails as well as those proposed in the Interconnect Project, the two projects have been proposed independently.

In addition to a variety of state permits and regulatory approvals including the Encroachment Permit, a Conditional Use Determination ("CUD")[6] and Act 250 approval', both the proposed Woodward Reservoir Project and the Interconnect Project are subject to the U.S. Army Corps of Engineers ("Corps") jurisdiction. In particular, the dredging and filling of the waters affected by these proposed activities require a Corps permit pursuant to 33 U.S.C. $1344 (§404 Permit) and the corresponding federal regulations codified at 33 CFR Parts 320 through 330. The requirement to obtain a §404 Permit triggers Killington's requirement to secure a $401 Certification from the State of Vermont. See 33 U.S.C. §1341. As explained in the parties' filings, Killington submitted a consolidated application for both the Woodward Reservoir Project and the Interconnect Project to the Corps. ANR, therefore, issued a single $401 certification.

The §401 Certification addresses the Woodward Reservoir Project, the Interconnect Project and those other components of Killington's expanded snowmaking proposal which involve management of, or potential impacts to, the following waters: (i) several of Killington's existing snowmaking water sources including the Ottauqueeche River, Roaring Brook, and Falls Brook, (ii) several Class III wetlands within the Roaring Brook watershed (identified in the $401 Certification on appeal as Wetland A, I, J, Q, R, and S); (iii) two Class III wetlands along the Route 100 corridor (identified in the $401 Certification on appeal as Wetlands 1 and 2); (iv) two Class III and one Class II wetland

6 With respect to the Class II wetland, Killington sought a conditional use determination from the ANR and on November 21, 1997, received CUD #97-405. The CUD was not appealed.

7 One such approval has been obtained through the District #1 Environmental Commission's issuance of Land Use Permit Amendment #1R0813-2 to Killington for a project generally described as the interconnect which is substantially similar to the component of Killington's proposed activity defined herein as the Interconnect Project. That permit amendment has not been appealed. Killington's application for Land Use Permit Amendment #1R0813-5 for a project generally described as the Woodward Reservoir project which is substantially similar to the component of Killington's proposed activity defined herein as the Woodward Reservoir Project was appealed and is presently pending before the Environmental Board.

that are associated with Woodward Reservoir (identified in the $401 Certification on appeal as Wetlands 3 and 4 and the Class II wetland identified as a "floating peat mat" and which is the subject of CUD #97-405); (v) a Class III broad-leaved deciduous forested palustrine wetland which is drained by a small, intermittent tributary of Kent Brook (identified in the $401 Certification on appeal as Wetland M); (vi) limited segments of small streams in the Roaring and Kent Brook watersheds that are designated as Class A waters because they are at an elevation above 2500 feet mean sea level ("msl") as well as the portions of those streams below 2500 feet msl where they are classified as Class B waters; finally (vii) those waters which either flow directly into the Woodward Reservoir or directly out of it, these include an unnamed tributary along Route 100 flowing into the western side of Woodward Reservoir as well as Reservoir Brook and its tributaries (principal among which is the Madden Brook).

Although the §401 Certification on appeal addressed water quality-related issues arising from Killington's proposed activities affecting each of the above-enumerated waters, only a subset of those water quality-related issues has been properly appealed by the §401 Appellants. Accordingly the scope of review has been limited in the referenced cases in the manner described in Section III. below.

III. SCOPE OF REVIEW AND STATEMENT OF ISSUES

A. THE §401 APPEAL

The scope of review in the $40 I Appeal has been limited to match the extent of the Appellants' party status. In determining the scope of the §401 Appeal, the Board concluded that it would limit the scope of review to water quality-related issues involving the Woodward Reservoir and those waters associated with Woodward Reservoir - previously defined in memoranda of decision as - the "Associated Waterbodies." As discussed in detail in the memoranda of decision dated March 30, 1998 and May 20, 1998, the Interconnect Project is not within the Board's jurisdiction due to the Appellants' failure to identify any substantial (i.e. legally protected) interest in those waters.* As described in those memoranda of decision, the Appellants' aggrievement, and therefore, their party standing, arises from potential impacts to the Woodward Reservoir and the Associated Waterbodies. The Associated Waterbodies include those

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Those waters enumerated as numbers (ii), (v), and (vi) in the last paragraph of page 6, at Section II, above, were addressed by the §401 Certification in conjunction with ANR's review of Killington's proposed Interconnect Project.

waters enumerated in the last paragraph on page 6 at Section II, above, as (iv) and (vii), as well as Falls Brook from (i). Accordingly, the Board's review of the §401 Certification is limited to an evaluation of impacts on those waters.

The issue statements set forth below are derived from the summary of issues in the Board's March 30, 1998 MOD on Scope of Review and Appropriate State Law Requirements in WQC-97-10 and its May 20, 1998 MOD on Scope of Review and Appropriate State Law Requirements in WQC-97-10. A complete statement of the issues presented in the Appellants Notice of Appeal may be found at pages 5 through 8 of the March 30, 1998 MOD. The following re-statement of those issues includes only those properly within the scope of review, For ease of reference, the letter denoting the subparagraph of the issue, as it appeared in the notice of appeal, and as used in the March 30, 1998 MOD has been retained in brackets. The final statement of issues in the §401 Appeal follows:

1. Vermont Water Quality Standards Issues

   a. Whether the Woodward Reservoir Project will result in the maintenance and protection of all existing water quality standards for Woodward Reservoir and the affected brooks and streams (i.e. *Associated Waterbodies*) pursuant to the provisions of §1-03 of the VWQS [from subparagraph (d)];

   b. Whether the Woodward Reservoir Project and ice conditions will result in an undue adverse effect on beneficial values and uses, or existing uses, contrary to §2-02 of the VWQS [from subparagraph (k)];

      (i) Whether the water drawdown (of Woodward Reservoir) will affect ice thickness to the extent that it results in dangerous ice conditions adversely impacting on recreational uses, and aesthetics [from subparagraph (h)];

   c. Whether the Woodward Reservoir Project may result in an adverse effect on the aquatic vista, the physical and chemical nature of the substrate and the species composition, and propagation of fish as described in §3-01(B)(5) of the VWQS [from subparagraph (I)];

d. Whether the Woodward Reservoir Project complies with §3-03 of the VWQS concerning Class B waters [from subparagraph (b)];

e. Whether there has been a sufficient demonstration that adverse effects of the Woodward Reservoir Project have been minimized such that only a limited reduction in water quality is being allowed pursuant to the Anti-degradation policy set forth at §1-03 of the VWQS [from subparagraph (c)];

f. Whether the Woodward Reservoir Project violates the provisions of Water Quality Criteria §3-01 of the VWQS for aquatic habitat [from subparagraph (g)];

(i) Whether the Applicant has failed to prepare a sufficient water level management plan to assure the protection of smelt spawning and protection of resident fish from predators in the Woodward Reservoir and streams [from subparagraph (p)];

(ii) Whether the construction of intake and pipeline and the associated winter water drawdown may result in undue erosion and sedimentation at the Woodward Reservoir [from subparagraph (m)];

g. Whether the Applicant provided an adequate review of water conservation measures, water use efficiency and ground water alternatives [subparagraph (e)];

h. Whether the Applicant has submitted an approved monitoring plan and developed adequate safety devices to determine permit compliance [from subparagraph (t)];

i. Whether the Water Quality Certificate Application is incomplete due to lack of final designs of all intakes, pipeline crossings and the interconnect trail and road

stream crossings [from subparagraph (v)] (Such issue has *only been addressed to the degree that it involves Woodward Reservoir and the Associated Waterbodies).*

2. Other Appropriate Requirements of State Law

Water Withdrawals for Snowmaking - Chapter 16 of the EPRs

a. Whether the Applicant has failed to adequately consider feasible and reasonable alternatives to the Woodward Reservoir drawdown and its effect on Reservoir Brook, and other brooks (i.e. *the Associated Waterbodies*), as required by § 16-05 of the Environmental Protection Rules concerning Water Withdrawals for Snowmaking [from subparagraph (f)]

State Water Quality Policy - 10 V.S.A. §1250

b. Whether the Woodward Reservoir Project violates water quality policy set forth at 10 V.S.A. $1250

(i) Specifically, subparagraph 6 which states that it is the policy of Vermont to: "protect from risk and preserve in their natural state certain high quality waters, including fragile high-altitude waters, and the ecosystems they sustain." [from subparagraph (a)];

B. THE MLP APPEAL

The scope of review in the MLP Appeal has been limited to consideration of those issues set forth in the Board's February 10, 1998 MOD on Scope and Standing in the MLP Appeal and its March 20, 1998 MOD on Scope and Standing in the MLP Appeal The final statement of issues relative to the MLP Appeal is as follows:

1. Public Good

a. Whether pursuant to 29 V.S.A. §§401-409, the [Woodward Reservoir] Project adversely affects the public good with regard to the effect of the proposed encroachment as well as the potential cumulative effect of existing encroachments on

water quality, fish and wildlife habitat, aquatic and shoreline vegetation, navigation and other recreational and public use, including fishing and swimming, consistency with the natural surroundings, and consistency with municipal shore land zoning ordinances or any applicable state plans.

2. Public Trust Doctrine

a. Whether the [Woodward Reservoir] Project, after giving due consideration to the cumulative effect of the [Woodward Reservoir] Project on the waters of the State of Vermont, will have a detrimental effect on public trust uses.

IV ADDITIONAL PRELIMINARY ISSUES

A. RULING ON WTEBLOCUTORY APPEAL REQUEST

On May 28, 1998, the Appellants filed another Motion to Continue and a Motion for Interlocutory Appeal, The Motion for Interlocutory Appeal was filed with respect to the Board's May 20, 1998 MOD, In the Motion for Interlocutory Appeal, Appellants requested the Board to certify the following two questions to the Superior Court:

1. Whether the Board erred in ruling that Appellants have failed to qualii for party status on issues relating to the Interconnect in the instant appeal.

2. Whether the Board erred in denying Appellants an opportunity to argue public trust issues with respect to the Interconnect Project.

On May 29, 1998, Killington tiled its Objection and Opposition to Interlocutory Appeal and Motion to Continue.

Before commencing the collection of evidence relative to the §401 Appeal and the MLP Appeal, the Board ruled on the pending Motion to Continue and Motion for Interlocutory Appeal. The Board declined the request to certify the above-referenced issues to the Superior Court because an adjudication of the §401 Appeal was not dependent upon Superior Court review of these two issues. The Board concluded that any alleged error arising out of either the Board's decision to deny Appellants' party status as to the Interconnect, or to exclude an additional public trust review of the proposed Interconnect Project in the context of the $401 appeal, could be addressed in

conjunction with a properly filed appeal of the Boards final decision in this matter. Moreover, the Appellants failed to provide any legal argument in support of the Board's authority to certify issues as ripe for interlocutory review. Accordingly, the Motion for Interlocutory Appeal and the Motion to Continue were both denied by an oral ruling of the Board at the outset of the merits hearing.

B. SITE VISIT

On June 1, 1998, the Board conducted a site visit of the Woodward Reservoir in a manner consistent with the Proposed Site Visit Protocol agreed upon by the parties at the May 28, 1998 prehearing conference. Upon convening the merits hearing, the Board distributed a summary of its observations in its "Site Visit Observations." The parties provided oral comment on the Board's written summary all of which were adopted therein. Chair Davies then read the Site Visit Observations, including the parties' modifications, into the record of the proceeding.

C. MERITS HEARING AND SUMMARY OF DELIBERATIONS

The Board heard evidence on June 2 and 3, 1998. In this consolidated appeal the Board has afforded all parties an opportunity to respond and present evidence and argument on all issues involved, as required by the Vermont Administrative Procedure Act 3 V.S.A. §809(c). Immediately after the conclusion of the merits hearing on June 3, 1998, the Board deliberated with respect to this matter. The Board conducted additional deliberations on June 23, July 21, July 28, August 4, and August 11, 1998. At the conclusion of its August 11 deliberation, the Board determined the record complete and concluded its deliberations

This matter is now ready for decision. To the extent any proposed findings of fact and conclusions of law are included below, they are granted; otherwise, they have been considered and are denied. See Petition of Village of, 143 vt. 437,445 (1983).

V. FINDINGS OF FACT

As indicated at the outset of this decision, as a consequence of the Board's memoranda of decision in the §401 Appeal and the statement of issues set forth in Section III.A., certain of the water quality-related issues arising from the Interconnect Project and the Woodward Reservoir Project addressed by the §401 Certification dated November 21, 1997 will not be reviewed herein because they are not within the scope of review. Particular sections, findings, or conditions that relate to these waters, will be retained as originally stated in the §401 Certification dated November 21, 1997. Although the location of those particular sections, findings, or conditions may change in the §401 Certification issued herewith, for the purpose of clarity and consistency, the retained text will be italicized to demonstrate that the Board did not make new findings, conclusions, or conditions relative to these issues, but rather, retained the text of the §401 Certification dated November 21, 1997 undisturbed.

Characteristics of Woodward Reservoir

1. Woodward Reservoir constitutes "public waters" of the State of Vermont as defined in 10 V.S.A. §1423(6).

2. Woodward Reservoir, located in the Town of Plymouth, is a body of water on which the water level has been controlled by a dam located at its north end. The Reservoir has an elongated configuration oriented on a roughly north-south axis bounded on its westerly shoreline by Vermont Route 100.

3. Woodward Reservoir has a surface area of about 110 acres, a maximum depth of 48 feet and a mean depth of 22 feet. The estimated volume is approximately 690 million gallons ("Mgal"). The drainage area at the outlet is 2.9 square miles.

4. Inflow to the Reservoir is from several sources including overland surface water runoff, groundwater seeps, and several unnamed tributaries. Outflow is via the Reservoir Brook at the northerly end of the Reservoir.

5. The southern portion of Woodward Reservoir is roughly oval shaped and is over 1000 feet wide at its widest point. The northern portion consists of a series of relatively narrow linear "arms" extending in a northerly direction on both sides of a landform known as "Bear Pit Point."

6. A public fishing and boating access is located near the north end of Woodward Reservoir.

7. Woodward Reservoir was originally known as Bishop's Pond. The natural pond was enlarged through the construction of a dam as early as the mid-1800s. Another dam was constructed around the turn of the century to store water for use by the Bridgewater Woolen Company, located on the Ottauquechee River in the town of Bridgewater. This dam was a stone and earthfill structure, and a concrete face was added on the upstream side in the 1920s.

8. The dam, along with much of the shoreline property on the east side of the Reservoir, was acquired by Farm and Wilderness circa 1950. In 1983, the dam was rebuilt as a zoned earthfill structure. The project was authorized by Dam Order No. 82-5 issued by the Department of Water Resources and Environmental Engineering (now the Department of Environmental Conservation or "DEC") on June 13, 1983.

9. The following table represents a depth to surface area relationship for Woodward Reservoir where "Depth" is the vertical distance from the spillway crest (elevation 1345.5 feet msl at full pool) to the drawdown water surface.

Table 1: Woodward Reservoir Stage/Storage Relationship

Depth (feet)	Surface Area (acres)	Volume (Mgal)
0	110	690
1	107	655
2	104	620
3	102	586
4	99	554
5	96	522
6	94	491
7	91	461
8	88	432
9	85	404
10	82	376
11	80	350
12	77	324

10. By a decision dated February 15, 1995, and in response to a petition filed on May 2, 1994, the Board adopted certain rules regulating the use of

Woodward Reservoir, including a speed limit on the Reservoir. However, the Board has not been petitioned pursuant to 10 V.S.A. §905(2) to adopt rules governing the surface level of Woodward Reservoir.

Characteristics of the Associated Waterbodies

11. Reservoir Brook arises in the southwest corner of the Ottauquechee River watershed in the uplands east of the Coolidge Range. Most of the headwaters area is forested and undeveloped. The Brook flows north from Woodward Reservoir in Plymouth for approximately two miles to the Ottauquechee River at West Bridgewater. Madden Brook is a major tributary of Reservoir Brook that flows from an undeveloped area south of Killington Peak. At the confluence of Reservoir Brook and the Ottauquechee River, the former's drainage area is 4.5 square miles.

12. With the exception of Killington's existing snowmaking water withdrawals, the flow of the Ottauquechee is currently unregulated above West Bridgewater. The flow of Reservoir Brook is likewise unregulated between the completion of the Woodward Reservoir refill in the spring and the commencement of the drawdown in the fall.

Characteristics of Impacted Wetlands

13. *Several Class Three wetlands will be impacted by the Killington/Pico Interconnect:*

Wetland A is a 0.13 acre mix of broad-leaved deciduous scrub-shrub and forested palustrine wetland with organic soils. It is dominated by red and sugar maples and cm understory of yellow birch, spruces and hemlocks. Wetland hydrology is maintained by groundwater seepage. It is located in the Roaring Brook watershed. The ctpplicantproposes to fill the wetland for the construction of Trail 7 and Lift 3. The wetland has value for the storage of storm and flood (melt) water. That function is proposed to be mitigated by the construction of a retention basin with a stone-lined outfall prior to the waters entering Roaring Brook.

Wetland I is a broad-leaved deciduous forestedpalustrine wetland underlain by organic soils. Vegetation is dominated by beech, maple, and yellow birch. The wetland, located in the Roaring Brook watershed is fed by a series of seeps from the northwest. The area has been previously

disturbed by logging. The down and deadwoodprovides suitable habitat for salamanders. The earthworks for the construction of Trails 8, 9, and Lift 4 would affect the majority of the wetland about 0.43 acre. Wetland Jis similar in composition to Wetland A. It is located in the Roaring Brook watershed The wetland will be filledfor the construction of Trail 8. One-fifth (0.05 acre) **of** *this wetland isproposed to be filled. The overstory consists of sugar maple andyellow birch, with an understory ofjewelweed shining clubmoss and evergreen woodfern. It has a sparse canopy. This opening has allowedfor a diversity of herbaceous vegetation which* **can** *provide suitable habitat for seed eating and insectivorous birds, particularly the Olive-sidedflycatcher. The soils are organic with low chromas. This wetland functions to retain snowmelt runoff The small extent of proposed filling will not significantly affect this function,*

Wetland M is a broad-leaved deciduous forested palustrine wetland. Hydrology is maintained by groundwater seepage. A small intermittent stream drains the wetland to a tributary of Kent Brook. The wetland will be filled for the construction of Trail 5 and Lift 2. The applicant has proposed filling two thirds of this 0.44 acre wetlandfor a total of 0.31 acres of impact. The remainingportion will be ungraded but maintained as Trail 5. Therefore, all of this wetland will be impacted by the proposed project. Visually it differs little from the surrounding woods. The significant stand of spruce may provide habitat for spruce grouse. Numerous down and dead woodprovides suitable salamander habitat.

Wetlands Q, R, and S have been disturbed by previous logging activities and will be impacted by the proposed work road. These small wetlands have much down and dead wood However, their size limits their habitat suitability. Wetland Q receives water from a tributary of Roaring Brook andwetlands R and S receive water from groundwater seepage andpoorly drained rainwater,

Design changes and considerations made to mitigate and avoid wetland impacts include realignment of trails 4, 7, 8 and 9. Grading has been minimized at the base of trails 5 and 9.

14. One Class Two and two Class Three wetlands are impacted by the water level management of Woodward Reservoir.

15. The floating mat wetland at Woodward Reservoir is identified as a saturated broad-leaved evergreen scrub-shrub palustrine wetland (PSS3B) on the Vermont Significant Wetland Inventory map (Map No. 26D) and is designated as a Class Two wetland by the Board in the Vermont Wetland Rules ("VWRs"). The wetland is in a cove in the northeast area of the Reservoir; construction of the original dam probably flooded the peat bog that had formed at this site, creating the floating mat. It is dominated by peat moss (Sphagnum spp.) and leather leaf It is approximately 700 feet long and 100 feet wide or 1.6 acres. Surrounding the bog are the submerged plants--bushy pondweed, bladderwort, bur reed, water weed and pondweed (*Potamogeton* spp.). There is approximately 2 to 6 feet of water below the floating peat mat. Contiguous to the mapped wetland area are scrub-shrub and forested wetland areas along the northern and eastern edges of the cove. A sandbar crosses the entire mouth of the cove and is mounded such that when the Reservoir is full, the sand bar's highest point is within 5 feet of the Reservoir's surface. As a result of the shallower depth of the Reservoir in the mouth of the cove, the water level of the cove stabilizes even when the body of the Reservoir continues to be drawn down in excess of 5 feet. This stabilization occurs because drawdowns in excess of 5 feet have no additional hydrological impact on the cove.

16. The floating peat mat is significant for the functions of hydrophytic vegetation habitat, fish, wildlife, and migratory bird habitat, education and research in natural sciences, recreational value, and open space and aesthetics. No significant impacts to the functions of this wetland are anticipated by the proposed winter withdrawal.

17. A small emergent and open water wetland in Woodward Reservoir along Route 100 (identified as Wetland 3) is located in a backwater area behind a small island. Its emergent area is dominated by cattails and receives hydrologic inputs from culverts under Route 100. The open water area is dominated by bladderworts, water weed and arrowhead. No significant impacts to the functions of this wetland are anticipated by the proposed winter withdrawal,

18. A collection of very small emergent wetlands along the edge of Woodward Reservoir (identified as Wetland 4) receives hydrologic inputs from the Reservoir and via either inlets or road culverts. These are very low quality wetlands whose plants are resistant to perturbations. No

significant impacts to the functions of these wetlands are anticipated by the proposed winter withdrawal.

19. Two Class Three wetlands will be affected by the construction of the Woodward Reservoir pipeline and the new intake on Reservoir Brook at West Bridgewater:

a. Wetland 1 is located along Route 100. This is a broad-leaved deciduous shrub-scrub palustrine wetland. Burying the pipeline would impact an area 40 feet by 20 feet that will be backfilled after the Woodward Reservoir Project is completed. This wetland provides temporary storage for flood waters from Reservoir Brook and erosion control through binding and stabilizing the soil. The proposed pipeline will not significantly impact these functions.

b. Wetland 2 is a poorly drained ditch off Route 100. It is a low quality scrub-shrub palustrine wetland. It consists of poorly drained organic soils. Its primary functions are the maintenance of water quality and temporary storage of flood waters from Route 100. The pipeline would impact an area approximately 10 feet by 220 feet. Backfilling of the area would restore most of the wetland functions.

Historical and Current Management of Woodward Reservoir

20. **Since** the 1970s, Farm and Wilderness has drawn down Woodward Reservoir approximately 8 to 12 feet each year beginning in early to mid-November. The purposes of the drawdown have been to protect docks and other shoreline structures and to reduce sedimentation and aquatic plant growth in swimming areas, The drawdown has been accomplished by opening the spillway sluicegate until the desired water level was achieved (usually at a rate of about 3 inches per day and taking about 4 to 6 weeks), at which time the gate has been shut to about ⅛ gate to stabilize the Reservoir water level. During the drawdown period, partial opening of the sluicegate has resulted in discharges to Reservoir Brook of about 20-30 cubic feet per second ("cfs").

21. Due to changes in inflow during the winter, the water level fluctuates up to 2 feet above and below the target water level. Gate adjustments were

continuously made over the winter to attempt to maintain the Reservoir close to the target level. Although stabilization has been the goal, it has typically never been fully achieved.

22. Sometime between March 6 and April 1, the gate has been closed all the way and the pond has impounded water until full pond elevation has been achieved. When the gate is closed all the way, there is no visible water flow immediately downstream of the dam It has usually taken between 4 to 6 weeks for Woodward Reservoir to completely refill. Until the Reservoir refill is complete, Reservoir Brook has been virtually dry directly below the dam. Findings 20, 21, & 22 describe what will hereinafter be referred to as the "Historical Water Level Management Regime."

23. Although sporadic accounts of the Historical Water Level Management Regime were maintained by a Farm and Wilderness employee, detailed and accurate water level management records are not available.

24. Under the Historical Water Level Management Regime, the date on which full pond level has been reached has varied annually, ranging from mid-April to as late as mid-May. The date on which the gate is closed, the amount and form of springtime precipitation, the rate of snowmelt, and the volume of snow from the preceding winter are all variables which collectively influence the date by which full pond level is reached.

Background to Killington's Application

25. **Killington proposes:** 1) to expand the Killington snowmaking system to provide water for additional snowmaking acreage and to meet conservation flow standards at existing water withdrawals; and 2) to construct new ski lifts and trails in the area between Rams Head and Pico Peak.

26. A July 1996 Memorandum of Agreement ("MOA") between Killington, the ANR, and other parties resolved issues related to conservation of wildlife habitat in Parkers Gore, resort expansion, hiking trail protection, and substandard flow conditions at Killington's three existing water sources. Key components of the MOA include: 1) Killington would implement conservation flows at the three existing water sources; 2) Farm

and Wilderness would allow Killington to use Woodward Reservoir dam and the Reservoir storage for snowmaking use; 3) Killington would complete a needs and alternatives analysis, pursuant to the Agency's Environmental Protection Rules, Chapter 16. *Water Withdrawals for Snowmaking;* and 4) ANR would approve the exchange of certain lands owned by the State of Vermont below elevation 2500 feet in the Calvin Coolidge State Forest for Killington lands above elevation 2500 feet in Parkers Gore.

27. On May 6, 1997, the Vermont Legislature authorized the land exchange contingent on the execution of an agreement between Farm and Wilderness and Killington to secure water storage capacity from Woodward Reservoir for the purpose of snowmaking by Killington. See, Act No. 21, Public Acts, 1997, An Act Relating to an Exchange of Lands and Black Bear Protection.

28. The Killington project covered by the §401 Certification includes the Woodward Reservoir Project and the Interconnect Project as well as the restoration of conservation flows at Killington's existing water sources (the Ottauquechee River, Falls Brook, and Roaring Brook).

29. The Woodward Reservoir Project directly affects Woodward Reservoir, Reservoir Brook, and Madden Brook. Falls Brook is not in the Reservoir Brook drainage and is not directly affected by water level manipulation at Woodward Reservoir. Like Roaring Brook, it is a separate tributary of the Ottauquechee River.

30. Killington proposes to construct two new water withdrawal sources in the Reservoir Brook watershed. One intake would be installed at Woodward Reservoir, and a second intake would be installed about 1.7 miles downstream of the Reservoir's dam at West Bridgewater. The drainage areas at these two locations are 2.9 square miles and 7.4 square miles, respectively. The Woodward Reservoir intake would be located on the northwest shore of the Reservoir and the Reservoir Brook intake would be located adjacent to the Sunrise base area east parking lot. A primary pumping station at the Sunrise base area would pump water through an upgraded pipeline to the Bear Mountain and Killington Basin snowmaking systems,

31. As part of the snowmaking system expansion, Killington would maintain conservation flows at the existing snowmaking water sources--Roaring Brook, Falls Brook, and the Ottauquechee River (known as the Gondola Withdrawal).

The Woodward Reservoir Withdrawal

32. Killington would draw an average of 5-6 feet of water from the Woodward Reservoir via the new intake for snowmaking purposes; hydrants would also be installed for seasonal firefighting use by the Town of Plymouth.

33. A water intake and below-grade siphon house would be constructed on the west shore of the Reservoir adjacent to Vermont Route 100, between the Department of Fish and Wildlife ("DFW") access area and the dam.

34, The Woodward Reservoir intake would consist of a 24-inch diameter welded steel pipe (inlet invert at 1328 feet msl), a 2-inch steel pipe for priming the system, and a 12-inch steel pipe to supply water to a fire hydrant located beside Vermont Route 100 for municipal fire fighting purposes. There would be an intake filter box at the end of the pipes, constructed as an angle iron frame with the five open sides covered with an expanded metal screen with 2"x3" openings. The intake box would be 8 feet wide by 4 feet long by 3 feet high. The top of the intake would be approximately 15.5 feet below the normal summer water level.

35 The intake construction would require two to three days to complete, therefore allowing the work to be scheduled during favorable weather conditions, The trench for pipeline installation would be 3.5 feet wide at its base, with 1:4 (H:V) side slopes, and variable depth ranging from 6 to 8 feet below existing grade, The trench would be backfilled with clean fill, including pipe bedding material with no stones or rocks larger than 2" in diameter, indigenous material, and stone riprap placed within the upper 2 feet of the trench, to provide bank stabilization.

36 By conducting the installation utilizing a 12 foot drawdown, only a small segment of the pipeline trench would be below the resultant water level. A silt fence would be installed above the water level and a silt curtain would be installed below the water level to contain sediment within the work area that is disturbed during the excavation of the pipeline trench. Following

the settlement of any suspended sediment inside the silt curtain, it would be removed. It is anticipated that the construction sequence can be completed during two to three winter work days. This procedure will minimize any impacts to water quality in the Reservoir during construction.

37. The pipe system would not be visible. It would be buried to prevent the pipe from freezing and to mitigate the systems impacts upon aesthetics. The access to the pump house and the dry hydrant assembly on land would be visible within the Route 100 right-of-way after completion of the Woodward Reservoir Project, The access to the pump house would be approximately 6 feet long by 5 feet wide and 3 feet high, with the rest being below grade, The exposed portion would be sided with wood shakes and low growing shrubs would be planted as a partial visual barrier. A warning light would extend approximately 4 feet above the ground and must be visible, but would only be activated as a result of pump failure.

38. The Woodward Reservoir intake would operate via siphon and gravity, and only a small priming pump would be required in the vicinity of Woodward Reservoir. Up to 10,000 gallons per minute, or 22 cubic feet per second (cfs) would be withdrawn from the Reservoir for snowmaking. Water would be withdrawn from the Reservoir only during periods when snowmaking demand exceeds the maximum amount of water available from other permitted sources.

39. Killington would construct a pipeline approximately 10,000 feet in length within the right of way of Vermont Route 100 from the Reservoir siphon house to the westerly parking lot of the Killington Sunrise base area.

40. There would be four stream crossings in this portion of the pipeline route, two of which (Stream Crossings #2 and #4) would result in no instream impacts since the pipeline will cross above or below existing highway culverts. Stream Crossing #1 would involve the installation of the pipeline under Reservoir Brook. Following placement of the 24 inch diameter pipe, the streambed and banks would be restored to their existing conditions with native materials. Stream Crossing #3 would involve the installation of the pipeline beneath Madden Brook. The streambed and banks would be restored to original elevations with native materials

following installation of the proposed 24 inch diameter pipe. No water would be withdrawn from Madden Brook.

41. The pipeline generally would be constructed in the road ditch of Route 100. The existing vegetation consists of grass with some small brush. The only trees along the pipeline are some black alders in the vicinity of Stream Crossing # 1 under Reservoir Brook. These trees would either be replanted or replaced after construction of the crossing. The road crossings are designed to be installed using jack and bore procedures under the road.

42. The pipeline would be buried in the road ditch, about 25' off the road center line, and generally would be located on the opposite side of the road from Reservoir Brook. Only approximately 1,310 feet of the 10,000 feet of pipeline would be on same side of the road as Reservoir Brook. The pipeline would be excavated, installed and backfilled each day as work progresses with final grading and stabilization of all completed areas to be performed on a daily basis. All pipeline construction would be performed in accordance with the Erosion Control Plan and, where applicable, Wington's Erosion Control Guidelines.

43. The construction of the stream crossings would be performed in dry conditions by diverting stream flow around the pipe installation through temporary culverts combined with pumping around the construction, as needed. The first crossing of Reservoir Brook and the third (i.e. Madden Brook) crossing would be performed in dry conditions in accordance with the stream crossing construction narrative contained in the Erosion Control Plan. The pipe would be buried two feet below the stream bed and encased in concrete. The stream beds would be restored with the native stones removed during excavation. The stream banks would be stabilized with native stone or soil depending upon which material was removed. The second crossing would be in the air above the stream bed to avoid passing over the existing highway culvert. The side slopes on both sides of this crossing would be stabilized with stone after pipe installation. The fourth crossing would be under the end of the existing culverts and would not impact the stream bed. All of the crossings of the replacement pipe from Sunrise to the Killington basin would be under existing culverts or on existing bridges.

44. Killington would also construct a second water withdrawal structure on Reservoir Brook at the Sunrise base area near the confluence of Reservoir Brook and the Ottauquechee River in West Bridgewater.

45. The Reservoir Brook intake system would consist of a reinforced concrete slab weir base which would span the brook. Permanent sheet pile would be driven, upstream and downstream of the weir base, to refusal. The weir base and sheet pile would be flush with the streambed.

46. A concrete Parshall flume would be located adjacent to the west bank of the stream, and immediately adjacent to the weir foundation. A Parshall flume is a primary measurement device used to accurately gage the flow of a stream or open channel, by providing a specific geometry to create "critical flow" conditions.

47. The area inside the sheet piling would then be excavated, and the dam structure constructed. An inflatable rubber dam would be installed on the weir face, and would lie flat on this structure when uninflated. During construction, a temporary jersey barrier cofferdam would be used to divert stream flow, to allow work to occur in dry conditions.

48. During the winter months, the rubber dam would be inflated to an elevation of 1061.8 feet, which would enable measurement of stream flow at the 36 inch Parshall flume, and would allow for gravity inflow to the screened drop inlet located just upstream of the rubber dam. The intake structure would consist of a poured in place concrete structure of irregular shape. From the drop inlet, water would flow by gravity into the pumphouse, to be pumped to the main Killington snowmaking system. Stone riprap would be placed on either side of the stream channel for a distance of ten to twenty feet upstream and downstream of the weir to protect against erosion,

Falls Brook

49. Falls Brook is an existing water source for the Killington snowmaking system, which has operated historically with a minimum flow limit of 0.5 csm. Killington proposes to construct a measurement station to pass a minimum stream flow of 0.80 csm, equal to the Vermont statewide average February median flow, A bypass orifice and measurement weir are proposed to accomplish the passage. On an annual basis, the steel

orifice plate would be installed no earlier than November 1. Removal of the orifice plate would be completed annually, prior to March 3 1.

Proposed Drawdown Regime

50. The Reservoir would be drawn down annually via the snowmaking intake, typically beginning in early January but in some years as early as late November. During the snowmaking period, the Reservoir level would vary based on Killington's snowmaking water demands, water availability from other sources, and natural inflows to the Reservoir. Snowmaking use would generally end by March 15 under the terms of a lease agreement dated August 18, 1997 between Killington and the dam owner, Farm and Wilderness.

51. Refill of the Reservoir would begin when snowmaking use ends and inflows to the Reservoir exceed the downstream conservation flow release.

52. Killington proposes to install a water level sensor integral with the intake and to install telemetry equipment that will make real time data on Reservoir levels available to the system operator and the public.

53. Killington would operate the dam outlet during the snowmaking use and refill periods, Downstream flows in Reservoir Brook would be maintained by adjusting the sluice gate in the existing drop inlet/conduit spillway.

54. Killington would assume responsibility for gate management on November 1 each year and operate the gate until the completion of the refill.

55. The lease agreement between Farm and Wilderness and Killington requires the suspension of snowmaking withdrawals from the Reservoir by March 15. The lease neither specifies the date for commencement of snowmaking withdrawals nor obligates Farm and Wilderness to provide Killington with a full Reservoir at the beginning of the snowmaking season, The lease does, however, allow Farm and Wilderness to require Killington to cease use up to 15 days earlier than March 15 in years when refill to elevation 1345.5 feet msl (the crest of the principal spillway) by June 1 is not expected to occur without an earlier start. June 1 is considered by Farm and Wilderness to be the beginning of the summer camp season. Under the lease, Farm and Wilderness may also allow use to extend past March 15 in any given year.

56. Findings 50-55 constitute what will hereinafter be referred to as the "Proposed Drawdown Regime."

57. Data regarding streamflow in the vicinity of Woodward Reservoir has been collected over a 23 year period from two nearby U.S. Geological Survey gage stations, The Kent Brook gage near Sherburne, Vermont (Gage No. 01 150800), ("Kent Brook Gage") which has been discontinued, has a period of record from 1964 to 1974. The watershed area at that gaging station was 3.3 square miles. The other station that has been used is the Ottauquechee River gage (Gage No. 01150900) on the Ottauquechee River near West Bridgewater ("Ottauquechee River Gage"). The Ottauquechee River Gage has a period of record from 1985 to the present, The watershed area at the gaging station is 23.4 square miles.

58. Both the Ottauquechee River Gage and the Kent Brook Gage are near enough to the Woodward Reservoir Project to provide meaningful streamflow data relative to Killington's proposal.

59. Killington's modeling showed that if the start date of the Reservoir refill was March 15, the Reservoir would refill by May 7 for all of the years simulated using the data referred to in Finding 57, above, as summarized by the table set forth below:

Table 2: Date of complete refill, based on modeling of 23 years

Refill Completion Date	Percentage of Years Modeled
Before April 1	44
April 1 - 7	9
April 8 - 14	17
April 15 - 21	17
April 22 - 28	0
April 29 - May 7	13

60. Also based on streamflow data referred to in Finding 57, Killington has modeled the magnitude of the maximum seasonal drawdowns that would have occurred in those years if the Proposed Drawdown Regime were in place at Woodward Reservoir. The annual variability of the maximum magnitude of the drawdown, as modeled by Killington, is depicted in the table below:

Table 3: **Magnitude of maximum seasonal drawdown, based on modeling of 23 years**

Drawdown Range (feet)	Percentage of Years Modeled
-0.0 to -2.0	13
-2.1 to -4.0	22
-4.1 to -6.0	17
-6.1 to -8.0	30
-8.1 to -10.0	9
-10.1 to -12.0	9

Comparison of the Historical Water Level Management Regime with the Proposed Drawdown Regime

61. Under the Historical Water Level Management Regime, the discharge to Reservoir Brook carried with it a large amount of the Reservoir biomass, including fish. Approximately 40 percent of the Reservoir water volume is rapidly discharged in a relatively short period to time (4-6 weeks) through a 24-inch pipe in the base of the spillway riser. Under the Proposed Drawdown Regime, this gated pipe would only be used to maintain the conservation flow, The new snowmaking intake would draw the surplus water through a screen that will exclude fish, and the withdrawal rate would overall be at a slower rate -- up to 10,000 gpm, or 22 cfs maximum. Further, the magnitude of the average winter drawdown is being reduced substantially -- from 10 feet to 5 or 6 feet, so less water would be drained.

Streamflow Data: Measuring Devices and Monitoring

62. **Stream flow** measurement systems would be designed and installed to provide streamflow data from which compliance with streamflow requirements may be determined. The monitoring systems for each withdrawal point would be capable of providing the following data, during the entire fall/winter period.

Streamflow data:

Minimum instantaneous daily downstream flows;
Minimum instantaneous daily natural flows;
Hourly average natural flows;
Daily average natural flows;
Diversion Rates;
Hourly average diversion rate;
Daily maximum rate;
Total daily volume;
Daily average rate;
Reservoir Levels; and
Hourly reservoir levels.

63. In the Woodward Reservoir, a submerged monitoring device, e.g. a pressure transducer, is proposed to be installed at the location of the intake box. The pressure transducer provides an electronic readout of the water pressure above the elevation of the device. The readout then is converted to depth of water, and Reservoir stage, The data from the pressure transducer will be continuously recorded, thereby accurately tracking both the drawdown and refilling of the Reservoir.

64. A guaranteed outflow of 0.8 csm would be provided from Woodward Reservoir, meaning that, even if the natural inflow to the Reservoir falls below 0.8 csm, that outflow rate will be maintained by drawing down the pond. The control of the rate of outflow would be performed by adjusting the existing gate located at the base of the principal spillway tower at the dam Currently, the gate is adjusted manually by means of a stem and wheel located at the tower. The gate would be automated by adding a motor to the existing equipment, to allow for computerized control of its operation. The automated gate would adjust as the Reservoir level

declines, since without adjustment, there is likely to be a slight decline in the outflow rate. With automatic adjustment, the guaranteed conservation flow required by Chapter 16 of ANR's Environmental Protection Rules, entitled *Water Withdrawals for Snowmaking* ("Snowmaking Rules") will be achieved. The Snowmaking Rules require a minimum of 0.8 cubic feet per second per square mile ofupstream drainage ("csm")[9] to be maintained throughout the winter months.

65. The proposed Reservoir Brook withdrawal system would be capable of providing reliable streamflow data and include specific structures to ensure passage of conservation flows which would assure compliance with the VWQS and the Snowmaking Rules. Specifically, the structures would ensure that, whenever natural streamflows are less than FMF (0.8 csm) or when there is no demand for water by Killington and existing reservoirs are filled to capacity, the entire rate of natural streamflow would proceed downstream.

66. The modification of the Falls Brook withdrawal facility would enable the collection of reliable streamflow data which would assure compliance with the VWQS and the Snowmaking Rules and includes a channel with an orifice opening that would be used to *ensure* the downstream passage of all upstream flow when the natural flow rate is less than FMF, and a bypass flow equal to or greater than FMF as natural flows increase above that value. Flows above FMF would be eligible for withdrawal, and would flow into an existing pool and then by gravity into an existing 24 inch pipe which directs water to Bear Mountain Pond. If Bear Mountain pond is filled to capacity, no diversion would be allowed and all flow would proceed downstream. Data to be collected at the site would include continuous water level measurements to be taken with an automated monitoring system.

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[9] The applicable conservation flow, as set forth in the Snowmaking Rules, is the February Median Flow or "FMF." The statewide default FMF applies where adequate site-specific streamflow data is not available, as is the case here. The statewide FMF is equal to 0.80 csm. After sufficient data has been collected, as required by the attached Certification, a site-specific FMF will be derived and would become the applicable conservation flow.

Sequence of Withdrawals

67. Because the existing upland sources (Roaring Brook, Falls Brook) are proximate to the existing on-mountain snowmaking infrastructure, these sources would be used preferentially as natural streamflow conditions allow. As natural flows recede below the statewide average FMF of 0.8 csm, or as demand for snowmaking water exceeds the volume of water available from these sources, water would be pumped from the Ottauquechee River, using the existing Bear Mountain and Snowshed Ponds as transfer points to which water can be pumped when available from the river.

68. When natural streamflows and the volume of water available at the three existing withdrawal points is insufficient to meet the total snowmaking demand, water would be used from Reservoir Brook, if available, and then from Woodward Reservoir. The Reservoir would be the last source that would be utilized to provide water for snowmaking. For Killington, the water that can be obtained closer to the resort is less expensive to use, since it does not require costly pumping from distant locations.

69. The typical winter usage of water from the Reservoir by Killington for snowmaking would be as follows: No withdrawal would occur prior to November 1. The drawdown typically would begin in December and progress through the winter at a rate depending on actual streamflow conditions during the winter months and the resultant availability of water from the four other stream sources. The maximum drawdown would occur in February or early to mid-March. Generally, no withdrawal of water would occur following March 15. At all times following the annual initiation of drawdown of Woodward Reservoir by Killiigton and prior to completion of refill, a guaranteed downstream conservation flow of 0.8 csm would be released to Reservoir Brook.

Physical **and Chemical Water Quality**

Dissolved Oxygen ("DO") and Temperature

70. The proposed use of a portion of the flows of Reservoir Brook at West Bridgewater would be limited to the fall/winter snowmaking period and full conservation flow standards would be 'met. As a result, the impact of reduced flows on either the DO concentrations or the temperature of the

Brook will not be significant. In part, this is because the winter period is typically one of high-quality water conditions with respect to these chemical/physical parameters.

71. The temperature and DO data in Table 4 was collected by the DFW from Woodward Reservoir in July 1970.

Table 4: Woodward Reservoir Temperature & DO, July 20, 1970

Depth (feet)	Temperature (degrees F)	Dissolved Oxygen (ppm)
0	72.0	--
5	72.0	8.0
10	72.0	9.0
1s	64.0	9.0
20	52.0	10.0
25	47.0	6.0
30	43.5	4.0
35	41.0	--
40	41.0	0.0

72. The Woodward Reservoir Project will have no measurable effect on the summer water temperature or dissolved oxygen concentrations in the Reservoir. During all seasons of the year, it will have no measurable effect on any of the following water quality parameters:

Nitrates;
Turbidity;
Phosphorus;
Color;
Alkalinity;
Taste and Odor;
pH;
Oil, grease and scum;
Toxics;
Settleable, floating or suspended solids; or

Escherichia coli.

Fish and Other Aquatic Biota

Woodward Reservoir and Reservoir Brook

73. Woodward Reservoir is populated by brown and rainbow trout, yellow perch, rainbow smelt, largemouth and smallmouth bass, northern pike, chain pickerel, and several non-game fish species. Yellow perch are the dominant species but are generally small in size. The other warm-water game fish are only present in small numbers. Brown and rainbow trout are stocked annually by the DFW to provide a put-grow-and-take fishery. Records indicate that the DFW has stocked rainbow trout since at least 1964 and brown trout since 1977. Smelt were introduced by the DFW in 1972-74. The smelt are an important food source for other species, with the potential to contribute significantly to the survival and growth rates of brown and rainbow trout. Rainbow trout have not been found to hold over from year to year.

74. Smelt spawn in the tributaries of lakes and ponds, usually shortly after ice-out. In some locations, smelt are known to spawn along lakeshores; however, there is no documented shoreline smelt spawning in Woodward Reservoir. Ice-out timing varies from year to year, but can generally be expected to occur sometime between mid-April and early May. Smelt spawn over a one or two week period, and the eggs incubate for about 15 to 30 days, depending on water temperature. Smelt spawn in the main Reservoir tributary, an unnamed brook which enters the Reservoir from the west after crossing Vermont Route 100. Observations of smelt spawning and egg incubation by the DFW indicate that most smelt spawning occurs in the main tributary from late April to early May. When Reservoir levels have been low as a result of past drawdowns during the smelt spawning period, smelt have spawned in the remnant stream channel that is then inundated upon refill of the Reservoir. Eggs were killed by sunlight because they were laid in the unshaded portion of the Reservoir, or by silt deposited on the eggs as the Reservoir refilled.

75. Anecdotal reports indicate that fish have been stranded during the drawdown in the cove south of the Fish and Wildlife access area.

76. In general, Woodward Reservoir does not support extensive aquatic plant communities, A few shallow coves and protected areas do support common to abundant plant growth, most notably the protected cove containing the floating peat mat. The littoral zone of the Reservoir,

however, is generally steep and rocky, and due in part to these physical characteristics, is mostly devoid of plant life. Such would be the case even with a more nearly stabilized water level management regime than that proposed by Killington.

77. A survey conducted by the Water Quality Division in August 1995 located sixteen aquatic plant species in the Reservoir. Killington's consultant identified twenty aquatic plant species during a September 1996 survey. The Board witnessed many of these plants on its site visit, particularly those aquatic plant species that are associated with the floating peat mat. Most of the aquatic vegetation occurred in either average or abundant numbers and appeared to be healthy.

78. Under the Proposed Drawdown Regime, the floating peat mat and the aquatic plants associated with it should continue to flourish, in part due to the elevated "sand bar" at the mouth of the cove containing the wetland, which prevents any additional impact of Woodward Reservoir drawdowns that are in excess of 5 feet. At such level, the cove becomes hydrologically detached from the main body of the Reservoir. In the event that the Proposed Drawdown Regime has unforeseen impacts upon the floating peat mat, Condition S of the attached Certification will require ongoing monitoring by Killington. In addition, Condition S requires Killington to disclose to the DEC any significant impacts to the floating peat mat which may be the result of ice conditions and water level manipulation that are a consequence of the Woodward Reservoir Project.

79. The aquatic vegetation that is found along the shorelines of Woodward Reservoir has persisted under the Historical Water Level Management Regime. The aquatic vegetation that is present is similar to the vegetation found in other so-called Plymouth Lakes, including: Echo Lake, Amherst Lake, and Rescue Lake. Under the Proposed Drawdown Regime which is more restrictive than past practices in terms of impact to shoreline vegetation, the aquatic vegetation in Woodward Reservoir can reasonably be expected to improve.

80. Reservoir Brook is a productive brown trout stream and is one of the two best brown trout fisheries in the Ottauquechee basin. The stream also supports brook trout and rainbow trout; rainbow trout are known to use the lower reach of Madden Brook for spawning. Brown trout from the Ottauquechee River run up Reservoir Brook to spawn.

Ottauquechee River

81. *There are brook, brown and rainbow* **trout** *populations in the Ottauquechee River in the project area, with brown trout most numerous.*

82. *The DFW has documented wild brook trout populations in Roaring Brook. Brown and rainbow trout are found near its confluence with the Ottauquechee River, and some spawning takes place in the lower* reach.

Falls Brook

83. Brook, brown and rainbow trout are found in the lower reach of Falls Brook.

Interconnect Project Area

84. *Department [of Fish and Wildlife] biologists have limited information on the high elevation* ***perennial*** *streams in the interconnect area. Observations of the Roaring Brook tributary were made in 1989 (around elevation 2100 feet msl) and more recently* **as** *part of this review, and this stream can be assumed to typify the larger mountain streams in this area. Due to their steep gradient, the substrate is mostly composed of cobbles, boulders, and very coarse gravels. The substrate is covered by mosses and diatom periphyton, but the primary productivity is somewhat low due to the lack of sunlight penetration through the forest canopy. The alkalinity and pH are conducive to the support of brook trout, which have been observed in some of these streams, along with salamanders. The macroinvertebrate community is dominated by mayfly, stonefly and caddisfly taxa.*

Wildlife

85. There are no known occurrences of rare or irreplaceable natural areas or threatened and endangered animals or plants in the area impacted by the Woodward Reservoir Project.

86. Because of the hard substrate along the Reservoir shoreline, there are limited areas for reptile and amphibian hibernacula.

87. Investigations performed by Killington in September 1997 did not reveal any evidence of muskrats utilizing the Reservoir. A beaver lodge and. other signs were observed in the cove containing the Class Two wetland.

Recreation and Aesthetics

88. Summer recreational uses of Woodward Reservoir include swimming, boating and fishing. In the winter, the Reservoir is used for skating, ice fishing, cross-country skiing, and snowmobiling. Fishing is the primary recreational use of the Associated Waterbodies.

89. There is a public fishing access operated by the DFW on the western shore of Woodward Reservoir.

90. There are several docks and other relatively small structures located on the Reservoir. Several are owned by Farm and Wilderness, which owns much of the shoreline. Others are associated with several private homes and camps located mostly along the western shoreline. One camp on the southern end of the Reservoir is built out on piers over the Reservoir.

91. Killmgton has made a commitment to monitor and repair or replace structures along the shoreline that are not owned by Farm and Wilderness if they are damaged by ice as a result of the Proposed Drawdown Regime.

92. The Woodward Reservoir siphon house would be set back approximately 40 feet from the shoreline, and would be mostly below grade. The building would be insulated and noise from the priming pump should not be audible from the surrounding area.

93. The current drawdown creates a large dewatered zone of about 30 acres that is highly visible in the fall from Route 100. Under the Proposed Drawdown Regime, the dewatered zone will, on average, affect less acreage (See Table 1 at Finding 9). Also, because the drawdown will occur later in the fall or in the early part of winter, the dewatered zone is more likely to be covered with snow and less evident from a distance.

Shoreline Erosion and Applicable Shoreline Ordinances

94. Authorizations for the Woodward Reservoir Project and the Interconnect Project were issued by the Towns of Plymouth, Bridgewater, and Sherburne. All such decisions were issued in October and November of 1997.

95. The Town of Plymouth does not have a separate shoreland zoning ordinance. Plymouth, however, does have Zoning Regulations, adopted in July, 1973. The Project is located in the shoreland district. The pump house and intake structure are a'conditional use within the shoreland

district. As referenced above, the Plymouth Zoning Board of Adjustment granted Killington Conditional Use Permit #97-27 on October 7, 1997.

96. Each of the above referenced permits or authorizations are final and no appeal has been taken as to any of them.

97. During the Water Quality Division's August 1995 plant survey at Woodward Reservoir, active shoreline erosion was found to be limited to minor undercut banks and two more severe erosion areas apparently caused by foot traffic on steep slopes.

98. As noted above in Findings 32 - 48, all components of the Woodward Reservoir Project construction will include protection against additional erosion during construction,

99. *Construction of the Interconnect Project isproposed to fakeplace over a five year period.* **The** *first phase would include lifts I and 2, trails 2,3,4,5 and 6, and the mid-mountain lodge; the secondphase involves lift 3 and trail 7; and the last phase has lift 4 and trails 8 and 9. Construction activities in somephases overlap.*

100 *In conjunction with the Act 250 application for the [I]nterconnect Project (Land Use Permit Application No. IR0813-2), the applicant has filed an erosion and sediment confrolplan for the frail and lift development. The applicant has worked with the Agency [of Natural Resources] in revising* ***the*** *project design and erosion controlplan to reduce the risk to streams.*

The Snowmaking Rules

101. The Woodward Reservoir Project is subject to review under the ANR's rules for determining conservation flows at ski resort water withdrawals. Section 16-03 of the Snowmaking Rules establishes the February median flow ("FMF") as a general conservation flow standard for fall/winter snowmaking withdrawals. Where a stream-specific value is unavailable, the statewide average value of 0.80 *csm* is used.

102. Section 16-06 of the Snowmaking Rules defines the water use limitation for new systems. The limitation is 50 percent of the portion of the water between 0.80 csm (or the site-specific February median flow) and 1.4 csm from October 1 to November 30 and 50 percent of the portion of the water between 0.80 csm (or the site-specific February median flow) and 1.1 csm

from December 1 to March 3 1, plus any portion of the river flow in excess of the 1.4 csm or 1.1 csm.

103. Section 16-05(2) of the Snowmaking Rules requires an applicant to complete an alternatives analysis (commonly referred to as a "Needs and Alternatives Analysis" or "NAA") which contains an evaluation of the following:

a. The need for water
b. Potential water source and storage options
c. Water conservation and efficiency
d. General management practices

Water Availability and the NAA

104. In order to determine the volumes of water that would be available to the snowmaking system from Woodward Reservoir and Reservoir Brook, and the existing intakes on Falls Brook, Roaring Brook and the Ottauquechee River with conservation flow requirements in place, Killington conducted a water availability analysis as part of the NAA that is required by the Snowmaking Rules.

105. For the purposes of the hydrologic analysis, streamflow estimates were derived using data from two U.S. Geological Survey gaging stations in the vicinity: Kent Brook near Sherburne, Vermont (Gage No. 01150800) and Ottauquechee River near West Bridgewater, Vermont (Gage No. 01150900) (Referred to in Finding 57). Average daily stream flow data were utilized in the hydrologic analysis.

106. Data from the Kent Brook and Ottauquechee River gages were transformed based on drainage area to create an artificial flow record at each of the withdrawal locations, These adjusted data were used to simulate daily flow values for the source streams for a 22 year period (1964 to 1974 and 1985 to 1995). Daily yields for snowmaking inflow were calculated based on prescribed conservation flow values.

107. Historic water use by Killington from 1988-89 through 1996-97 has averaged 508 Mgal. The current snowmaking system serves 552 of 823 acres of skiing terrain.

108. At full resort buildout, there would be 1,073 acres of skiing terrain, of which 902 acres would be served by snowmaking. Based on the results of the analysis, 923 Mgal would be needed to meet the projected seasonal

demand at full buildout. The ANR's guidelines for alternatives analyses suggests as a design standard for an acceptable level of service attainment of 80 percent of the total demand (80% x 923 Mgal = 738 Mgal) in at least four out of five years,

Woodward Reservoir System: the Preferred Alternative

109. Killington evaluated use of Roaring Brook, Falls Brook, Woodward Reservoir, Reservoir Brook (at West Bridgewater) and the Ottauquechee River. Killington also evaluated 12 storage options with volumes ranging from 10 Mgal to 350 Mgal. The preferred alternative, which underpins the Woodward Reservoir Project, seeks to utilize the storage provided by Woodward Reservoir, with intakes there and on Reservoir Brook at West Bridgewater ("Preferred Alternative"), Under the Preferred Alternative, 100 percent of the snowmaking demand would be met in over 90 percent of the years modeled, with a 12-foot drawdown constraint.

110. Killington has proposed the Preferred Alternative which it studied pursuant to the NAA set forth at 16-05 of the Snowmaking Rules. Under the Snowmaking Rules, the proposed Woodward Reservoir Project intake is categorized as a new systemunder Section 16-06, and is subject to the February median flow standards described above.

111. Killington's proposal includes a provision to maintain a guaranteed flow of 0.80 csm below the dam during the drawdown and refill period. The maintenance of this flow during periods when inflow to the Reservoir is less than 0.80 csm will not result in a significant increase in the drawdown magnitude. The maximum increase has been estimated to be less than 4 inches,

The Reservoir Brook System

112. The Reservoir Brook at West Bridgewater withdrawal as proposed is also categorized as a new system under Section 16-06. Any portion of the flow in excess of these upper bounds may be removed up to the proposed capacity of the system. Killington proposes to meet these standards at the West Bridgewater withdrawal.

Ottauquechee River System

113. The Ottauquechee River withdrawal is an expanded existing system under Section 16-07 of the rules, Flow data exist which establish the site-specific February median flow as 0.98 csm. Killington proposes to meet this standard.

Falls Brook System

114. The Falls Brook system is also an expanded existing systemunder Section 16-07. No site-specific flow data exist, and Killington proposes to maintain a conservation flow of 0.80 csm.

Roaring Brook System

115. The Roaring Brook system is another expanded existing system under Section 16-07. Since site-specific data are lacking, Killington proposes to meet the default conservation flow standard of 0.80 csm.

VI. CONCLUSIONS OF LAW

A. STANDARD OF REVIEW

Title 10 V.S.A. §1024(a) provides that an appeal of a $401 Certification to the Board "shall be de *novo* and shall be conducted as a contested case." Likewise, 29 V.S.A. §406(b) provides that an appeal of an encroachment permit "shall be *de novo* and shall be conducted as a contested case."

The Vermont Supreme Court has held that "[i]n a *de novo* proceeding, the [reviewing] Board is required to hear the matter as if there had been no prior proceedings." In re Killington Ltd., 159 Vt. 206, 214 (1992). The Board in its memoranda of decision relative to both of the above-captioned matters acknowledged the requirement to hear this matter as if there had been no prior proceeding.

As in any proceeding that is quasi-judicial in nature, the process of decision in both the §401 Appeal and the MLP Appeal must be governed by the principle of the exclusiveness of the record. The applicability of a *de novo* standard requires the Board to collect new evidence and to create a comprehensive record upon which to base its decision.

In order to grant Killington's application for the §401 Certification that is required to be obtained in conjunction with the Corps' $404 Permit for both the Interconnect Project and the Woodward Reservoir Project, the Board must gather sufficient evidence relative to the $401 Appeal upon which the Board can make positive findings relative to the Woodward Reservoir and Interconnect Projects' compliance with the applicable provisions of sections 301, 302,303, 306 and 307 of the Federal CWA "and with any other appropriate requirement of State law." 33 U.S.C. §1341. With respect to the Encroachment Permit Appeal, the Board must make positive findings relative to the

Woodward Reservoir Project which ensure that it serves the public good, as defined by 29 V.S.A. §405, and to ensure compliance with the Public Trust Doctrine.

In the context of the §401 Appeal, limitations imposed by state water quality standards adopted pursuant to §303, at a minimum, are "appropriate" requirements of state law in the context of a §401 certification appeal. P.U.D. No. 1 of Jefferson County and City of Tacoma v. Washington Department of Ecology, 114 S. Ct. 1900, 1910 (1994). As a preliminary matter, the parties were directed to file legal memoranda identifying those other state law provisions which the parties claimed to be applicable to this proceeding. The Board concluded in its March 30, 1998 MOD in the §401 Appeal, and further clarified in its May 20, 1998 MOD, that the following state law requirements, in addition to the Vermont Water Quality Standards ("VWQS") effective May 21, 1997, were appropriate for consideration in this proceeding[10]?

Chapter 16 of the Environmental Protection Rules, effective February 15, 1996, Water Withdrawals for Snowmaking;

10 V.S.A. §1250 -Vermont Water Quality Policy.

B. BURDEN OF PROOF

The general rule in administrative proceedings is that the applicant or petitioner bears the burden of proof. 73A C.J.S. *Public Administrative Law And Procedure* §128 *(1983).* This general rule has been followed by both the Vermont Supreme Court and the Board. Petition of Lyndonville Village, 121 Vt. 185, 190-191 (1959); In re: Champlain Oil Company, Docket No. CUD-94-11, Findings of Fact, Conclusions of Law, and Order at 11 (Oct. 4, 1995, *revised* Nov. *1, 1995).* Killington is the applicant in these proceedings and, therefore, it bears the burden of proof with respect to both the §401 Appeal and the MLP Appeal.

The burden of proof is generally considered to include both the burden of production and the burden of persuasion. The burden of production means the burden of producing sufficient evidence upon which the Board can make positive findings relative

10 Although the Vermont Wetland Rules ("VWRs") are appropriate requirements of state law which are generally applicable in a §401 proceeding, as determined in the May 20, 1998 MOD, the Board has not conducted an independent VWR analysis in the context of this proceeding.

to the matters under consideration. The burden of persuasion refers to the burden of persuading the Board that certain facts are true. See Re: Killington, Ltd. and International Paper Realty Corp., #1R0584-EB-1, Findings of Fact and Conclusions of Law and Order (Revised) at 21 (Sep. 21, 1990). Generally, the party with the burden of persuasion must establish the elements of its case by a preponderance of the evidence. That generally occurs when the factfinder is satisfied that a proposition is more likely to be true than not true. 29 Am. Jur. 2d *Evidence* §157 (1994). The Vermont Supreme Court has provided further guidance with respect to the allocation of the burden of proof, specifically the risk of non-persuasion in an administrative proceeding. "The fact that a party has the burden of proof does not mean that he must necessarily shoulder it alone; it simply means that he, and not the other party, bears the risk of non-persuasion." In re Quechee Lakes Corporation, 154 Vt. 543, 553 (1989). Here, as in Quechee Lakes Corp., the Board is at liberty to consider all of the evidence, including that garnered from parties other than Killington and by the Board itself during its site visit, in determining whether the applicant has met its burden of persuasion.

C §401 CERTIFICATION

Section 401 of the CWA provides that:

> Any applicant for a Federal license or permit to conduct an activity including, but not limited to, the construction or operation of facilities, which may result in any discharge into the navigable waters, shall provide the licensing or permitting agency a certification from the State in which the discharge originates or will originate that any such discharge will comply with the applicable provisions of sections 301,302, 303,306, and 307 of [the CWA].

33 U.S.C. §1341(a)(1). The ANR shall be the certifying agency of the state for purposes of section 401 of the federal CWA and the secretary's determinations on these certifications shall be final action by the secretary appealable to the water resources board. 10 V.S.A. §1004.

The CWA further provides that:

> Any certification provided under [section 401] shall set forth any effluent limitations and other limitations, and monitoring requirements necessary to assure that any applicant for a federal license or permit will comply with any applicable effluent limitations and other limitations, under section 301 or 302 of [the CWA], standard of performance under section

> 306 of [the CWA], or prohibition, effluent standard, or pretreatment standard under section 307 of [the CWA], and with any other appropriate requirement of State law set forth in such certification, and shall become a condition on any Federal license or permit subject to the provisions of this section.

33 U.S.C. 1341(d).

Killington's proposed activities require a federal §404 permit for the dredge and fill of waters of the United States within the area affected by the Interconnect and Woodward Reservoir Projects. As such, both the Interconnect Project and Woodward Reservoir Project must also receive from ANR, or from the Board on appeal, a §401 certification that ensures compliance with the applicable provisions of sections 301, 302, 303, 306, and 307 of [the CWA], the VWQS, as well as any other appropriate requirement of State law. See Re: Lamoille River Hydroelectric Project, Docket Nos. WQ-94-03 and WQ-94-05, Findings of Fact, Conclusions of Law, and Order (November 6, 1996).

1. Vermont Water Quality Standards

The Board's analysis of compliance with the VWQS addresses those issues stated above in Section III.A. 1. as (a) through (f). Woodward Reservoir, Reservoir Brook and all of the Associated Waterbodies are designated as Class B waters and thus must be managed to support all of the beneficial uses and values applicable to Class B waters. See §4-10(A) of the VWQS. Class B waters are governed by the following management objectives:

> Class B waters shall be managed to achieve and maintain a high level of quality that is compatible with the following:
>
> 1. [Beneficial] Values - Water of a quality that consistently exhibits good aesthetic value and provides high quality habitat for aquatic biota, fish, and wildlife[and;]
>
> 2. [Beneficial] Uses - Public water supply with filtration and disinfection; irrigation and other agricultural uses; swimming and recreation.

VWQS §3-03(A). In addition, all existing uses of the waters shall be protected. Existing uses are those uses which have actually occurred on or after November 28, 1975, in or on

a water body whether or not the uses are included in the standard for classification of the particular water body. As provided for in §1-03 (B)(l) of the VWQS, existing uses shall be determined on a case by case basis by the Secretary of ANR. With respect to matters on appeal to the Board, wherein the determination of existing uses is required, such determination shall be made by the Board.

a. Aesthetics

Under the VWQS, §3-03 (A)(l), Class B waters shall be of a character that consistently exhibits good aesthetic value. Based on the above findings of fact, the Board concludes that Woodward Reservoir and the wetlands encompassed within it, and each of the Associated Waterbodies consistently exhibit good aesthetic value.

Under the Proposed Drawdown Regime, the withdrawal will only occur during the winter period. In some years, the drawdown may not begin until the middle part of winter. As a consequence, during those years the dewatered zone is likely to be covered with snow and, therefore, will be less evident from a distance than such a drawdown would be during the summer.

The attached Certification limits the frequency and duration of Killington's Woodward Reservoir drawdowns. Moreover, during those years in which drawdowns as great as 10 or even 12 feet do occur, such drawdowns at that magnitude will not be achieved until well into the winter period, perhaps as late as early March. As a consequence, the duration of the highest magnitude drawdowns, when the dewatered area approaches 30 acres, will be necessarily brief, except in the most exceptional climatic conditions.

Consistent releases of water to meet the requirements of the Snowmaking Rules in Reservoir Brook will eliminate historical conditions in which there was little or no water in the Brook. While this improvement does not alone constitute compliance with the VWQS, the Board concludes that the guaranteed flow release set forth in the attached Certification, will consistently exhibit good aesthetic value in Reservoir Brook,

Very few other segments of the Associated Waterbodies will experience any aesthetic impact as a result of the Woodward Reservoir Project. The stream crossings, intakes and other infrastructure associated with the withdrawals, when designed in the manner proscribed by Killington's application and the conditions

of the attached Certification and Encroachment Permit, will sufficiently mitigate any aesthetic impacts associated with the Woodward Reservoir Project.

The Board concludes that Killington's proposed Woodward Reservoir Project will ensure that Woodward Reservoir and all of the Associated Waterbodies, comply with the VWQS by consistently exhibiting good aesthetic value.

b. High quality habitat

In addition to their designation as Class B waters, Woodward Reservoir and the Associated Waterbodies, with the exception of those wetlands addressed herein, are managed as cold water fish habitat under the VWQS. See VWQS Appendix A: Fish Habitat Designation, The cold water fish habitat designation affects the applicable criteria for such parameters as temperature and dissolved oxygen, and also clarifies the expectations as to which fish species will predominate the waters.

(i) Woodward Reservoir

Killington's Proposed Drawdown Regime ensures that the Reservoir will provide high quality habitat for aquatic biota, fish, and wildlife. As described in the findings of fact, the DFW presently manages the Reservoir for a variety of cold water species. Other aquatic biota and wildlife, including a wide variety of warm water species, occur with some frequency in the Reservoir and Associated Waterbodies. Each of these will be protected under the Proposed Drawdown Regime. The spawning and incubation requirements of those fish which overwinter in the Reservoir will be met during the period of Killington's control over the Reservoir. In particular, smelt spawning is protected through the requirement that Killington complete the refill by April 23d of each year. This will ensure conditions needed for propagation of smelt, which is an important forage fish in the Reservoir, Under the Proposed Drawdown Regime, and as conditioned in the attached Certification and Encroachment Permit, the Project complies with § 3-03(A) of the VWQS in that the Woodward Reservoir will provide high quality habitat for aquatic biota, fish and wildlife.

(ii) Reservoir Brook

The Woodward Reservoir Project will comply with applicable provisions of the VWQS with respect to its impacts on the aquatic habitat of Reservoir

Brook. First, the Woodward Reservoir Project will eliminate the high flow discharges historically caused by drawing the Reservoir down very rapidly in the fall. Currently, the Reservoir is drawn down via a gated 24-inch pipe orifice. Beginning in early to mid-November, Farm and Wilderness lowers the Reservoir using a partial gate opening with a discharge estimated at 20-30 cfs; the entire drawdown usually takes only 4. to 6 weeks. Flows on this order are quite a bit higher than flows that normally occur in the fall, as the median flow in November is only about 5 cfs.

As discussed in the findings of fact, brown trout spawning is an important use of Reservoir Brook in the October-November period. Trout eggs remain in the stream gravels through the winter, Release of high flows during spawning may cause fish to spawn in areas that they would not select during natural lower flows. In addition, those areas used for spawning during artificially high flows may then become dewatered or frozen after the gate is closed down to release normal lower winter flows, causing increased egg mortality. The guaranteed release of flows of FMF, as required by the Snowmaking Rules, and made a condition of the attached Certification, will eliminate this risk and will provide high quality aquatic habitat for spawning salmonids, as well as other flow-sensitive organisms in Reservoir Brook.

The Woodward Reservoir Project also will eliminate the current practice of totally shutting down dam releases for spring refill which has historically resulted in virtually dry conditions in Reservoir Brook for some distance downstream. While elimination of historical conditions which have never been evaluated by the Board for compliance with the VWQS does not alone constitute compliance with the VWQS, the Board concludes that because the Woodward Reservoir Project will provide conservation flows at both Reservoir Brook withdrawal locations, high quality habitat will be achieved in all affected segments of Reservoir Brook during Killington's operational period.

In Reservoir Brook, the conservation flow standards contained in the Snowmaking Rules and made operative through the attached Certification provide adequate protection to support high quality habitat, which is a management objective for Class B waters.

(iii) Class Two Wetland (the Floating Peat Mat)

Palustrine wetlands and their contiguous areas that appear on the Vermont Significant Wetland Inventory maps have been designated Class Two wetlands by

the Board. The Floating Peat mat in the northeastern portion of Woodward Reservoir constitutes one such Class Two wetland. Any activity in a Class Two wetland or associated SO-foot buffer zone, other than allowed uses specified in Section 6.2 of the VWRs requires a CUD from ANR (VWRs, Sections 6.3 and 8). As noted in memoranda of decision relative to the scope of review in WQC-97-10, Killington applied for and received from ANR, CUD #97-405, dated November 21, 1997. CUD #97-405 was not appealed and the Board declined to review the merits of the CUD, or compliance with the VWRs, within the context of these consolidated appeals. Accordingly, the Board limits its review of potential impacts to Class Two wetlands associated with Woodward Reservoir only with reference to the VWQS.

All wetlands occurring in Vermont, Class One, Two or Three, are considered waters of the United States and as such, must comply with any applicable provision of the VWQS. With respect to compliance with the designated uses of aquatic habitat protection, aesthetics, and recreation, the Class Two floating peat mat in the northeasterly arm of Woodward Reservoir provides valuable aquatic habitat for a variety of wetland vegetation, as well as other organisms that depend upon the wetland. The Board concludes, in part based on its observations during the site visit, that the floating peat mat will continue to provide high quality aquatic habitat after Killington commences its Proposed Drawdown Regime. The organisms present on and near the floating peat mat comprise a diverse, healthy wetland community, which, though not rare, is uncommon in Vermont. The wetland has persisted through a long standing practice of annual ten to twelve foot drawdowns over the past fifty years.

It is questionable, due to the floating nature of the wetland and the sand bar that mitigates impacts of the highest magnitude drawdowns, whether the Proposed Drawdown Regime will have any impact upon the biological or aesthetic values associated with the floating peat mat. To the extent that such drawdowns might limit the abundance or diversity of species in the wetland, Condition S of the attached Certification ensures that any significant impacts to the wetland be brought the DEC's attention as soon as they are discovered. Protection of the biological and aesthetic values of the floating peat mat will also protect its recreational use as a subject of academic study and nature viewing.

(iv) Background Conditions

The Board concludes that the Woodward Reservoir Project will comply with §3-01(B)(5) of the VWQS, as there will be no change from the 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.

The evidence that has been presented demonstrates that nearly all aspects of the Woodward Reservoir Project will effect an improvement with respect to water quality in the Reservoir and the Associated Waterbodies over historical operating conditions. Background conditions, though not necessarily equivalent to historical conditions, are "conditions that exist in the absence of human or cultural influences or conditions due to human or cultural influences that are not subject to regulation or management under the Act or under 6 V.S.A. Chapter 215." VWQS §1-01(B)(7).

The Woodward Reservoir Project will improve the aquatic habitat as compared with existing operations. As discussed above, this improvement does not, of itself effect compliance with the VWQS. However, with respect to each of the issues addressed in §3-01(B)(5), the Woodward Reservoir Project will not result in a 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.

Construction of the intake and pipeline and the associated winter water drawdown will not result in undue erosion and sedimentation at Woodward Reservoir. Likewise, it will not result in an undue adverse effect upon either the physical or chemical nature of the substrate, The erosion which is present around the Reservoir appears to be largely the result of heavy foot traffic, rather than the existing drawdown regime, Killington's Proposed Drawdown Regime is likely to cause even less erosion or impacts to the substrate given the smaller magnitude of the drawdowns on average, and the delay in the start of drawdowns until after a hard freeze has occurred.

(v) Existing Uses

In addition to ensuring the protection of beneficial uses and values (i.e. designated uses) associated with Woodward Reservoir and the Associated Waterbodies, the VWQS require the Secretary to identify and protect existing uses

of all waters including wetlands. Existing uses of Woodward Reservoir include provision ofwetland habitat and research and educational functions associated with wetlands. (VWQS § 1-03(B)(1)).

In light of the foregoing discussion, and based on the findings of fact, the Board concludes that the existing use ofwetland habitat, as well as the other functions and values of the wetland, will be protected by Killington's proposed Woodward Reservoir Project.

(vi) Other Applicable Provisions of §3-01(B) and §3-03

The Board finds no basis upon which to conclude that the Woodward Reservoir Project will violate the provisions of VWQS §3-01(B)(1)-(4) and (6)-(10) regarding Dissolved Oxygen, Temperature, Phosphorus, Nitrates, Sludge Deposits, Settleable solids and floating solids, Alkalinity, pH, and toxic substances.

Killington's Reservoir withdrawal is limited to the late fall, winter, and early Spring periods. Adequate dissolved oxygen will be available in the Reservoir during this period and temperature issues are of little concern during the winter period. There will be no discharge to Woodward Reservoir once the Woodward Reservoir Project has been constructed. Thus, there is no basis upon which to conclude that the water withdrawal may cause a violation with respect to any of the above-named criteria, During construction, all reasonable efforts will be taken to avoid erosion or sedimentation to either Woodward Reservoir or any of the Associated Waterbodies.

The Woodward Reservoir Project complies with §3-03(B) of the VWQS in that the turbidity of the Woodward Reservoir and Brook will not exceed 10 NTU (cold water fish habitat); E-coli count will not exceed 77 organisms/l 00 ml; water color is acceptable and no taste or odor exists which will have an undue adverse effect on beneficial values or uses or on the taste or odor of the fish.

c. Recreation

(i) Summer

The intake is to be located near the dam, just north of the public access. The intake would be screened to prevent debris and fish from being entrained. As it would be located two feet below the maximum drawdown level, during summer

boating it would be submerged a full fourteen feet, presenting no hazard to navigation. The only visible elements would be the siphon house and bank stabilization work. The house would be mostly buried and located back from the shoreline and embankment, Limited rip rapping would be done at the trench location; this would be relatively minor and would tie into the extensive rip rap work that had been done directly to the north for the previous dam reconstruction.

(ii) Winter (ice-based)

The Proposed Drawdown Regime will not affect ice thickness of Woodward Reservoir to the extent that the Woodward Reservoir Project would fail to support the beneficial uses and values set forth at §3-03(A). Ice impacts resulting from the Proposed Drawdown Regime will not pose unsafe ice conditions for winter recreationalists. The ice will form a collar around the Reservoir and may, in some instances require a slight degree of increased care in accessing the surface of the Reservoir.

A number of winter uses currently occur at Woodward Reservoir, including skating, ice fishing, cross-country skiing, and snowmobiling. None of these uses would be impaired by the construction of the new intake or a change in the drawdown regime. The recreational precautions attendant to ice-related recreation on Woodward Reservoir approximate those required to be taken on natural lakes of similar size. The Woodward Reservoir Project complies with §3-03(A)(2) of the VWQS as it relates to recreation.

As the uses of the Reservoir will not be impaired by the Woodward Reservoir Project, it is not necessary to determine which, if any, of these winter recreational uses should be designated as existing uses for protection under the Anti-Degradation Policy (VWQS §1-03(B)).

d. Water conservation; monitoring; and sufficiency of final designs

With respect to those issues identified as (g) and (h) at Section III.A.1., above, the Board concludes that as conditioned in the attached §401 Certification, adequate consideration has been afforded to water conservation measures, water use efficiency, and ground water alternatives with respect to the proposed Woodward Reservoir and Reservoir Brook withdrawals. Likewise, the Board concludes that, as conditioned, adequate safety devices and sufficient monitoring will be employed to both ensure the protection of water quality and to enable ANR to evaluate permit and certification compliance on an ongoing basis.

With respect to issue (i), as stated in Section III.A.1., the Board concludes that Killington has met its burden of proof on the basis of the record before this Board relative to those issues within the scope ofreview. The Board declines to address in a separate analysis the alleged deficiencies in the final designs of intakes or pipeline crossings. Where approval of finalized plans or construction designs is dependent upon specific review or ongoing oversight by the DEC, conditions such as those identified as (I) through (M), *(Q)*, (R), (W), *(AA)*, (DD), and others within the attached Certification indicate as much and ensure that, among other things, compliance with the VWQS will be achieved.

As noted elsewhere herein, the Board has no jurisdiction in this matter to address issue (i) as it pertains to the Interconnect Project trails, stream crossings, or other construction associated with the Interconnect Project.

2. Other Appropriate Requirements of State Law

a. Environmental Protection Rules,
Ch. 16 - Water Withdrawals for Snowmaking

The Woodward Reservoir Project is subject to review under ANR's rules for determining conservation flows at ski resort water withdrawals. See 10 V.S.A. 103 1 - 103 2; and see *Environmental Protection Rules, Chapter 16: Water Withdrawals for Snowmaking* Agency of Natural Resources, (February 15, 1996) ("Snowmaking Rules"). Section 16-05 of the Snowmaking Rules provides for the completion of a needs and alternatives analysis ("NAA") that demonstrates an applicant's need for water and identities the best practicable alternative for supporting that need while protecting the environment, Under the Snowmaking Rules, ANR considers both natural resource and economic constraints in making its determination with respect to the Alternatives Analysis.

Compliance with the VWQS has been addressed in detail at Section VI.C.1., above. Having found that the Woodward Reservoir Project complies with all applicable provisions of the VWQS, the Board now turns to an analysis of whether the Woodward Reservoir Project complies with the applicable requirements of the Snowmaking Rules, which, for the purposes of this proceeding, constitute an other appropriate requirement of state law under §401(d) of the CWA.

One component of the Snowmaking Rules is a determination that among the alternatives considered, a proposed snowmaking withdrawal is economically feasible. Market dynamics dictate what it means to be "reasonable and feasible" in the context of a strict application of Section 16-05(1) of the Snowmaking Rules. While this may be appropriate in other applications of the Snowmaking Rules (i.e. ANR might consider both natural resource and economic constraints in making an ultimate determination), the Board's role in a §401 proceeding is to assess the impacts of whatever alternative is ultimately selected by an applicant relative to water quality as measured by the VWQS and other applicable law. See Re: Lamoille River Hydroelectric Project, Docket Nos. WQ-94-03 and WQ-94-05, Preliminary Rulings on Admissibility of Evidence and Scope of Review (August 15, 1995) at pp l-2 (Board held that evaluation of economic evidence relative to power production was not within the scope of review in the context of a 401 certification involving federal relicensure of hydroelectric dams on Lamoille River).

In this case, the Preferred Alternative after completion of the NAA is Killington's Woodward Reservoir and Reservoir Brook withdrawal, both of which underpin the Woodward Reservoir Project. Killington has proposed the Woodward Reservoir Project, and it is therefore presumed to be economically feasible. Having established that the Board's role in this case is principally to evaluate compliance with the VWQS, the Board also looks to any additional resource conservative constraints established by the Snowmaking Rules, to the extent that those constraints augment the protections afforded through the VWQS.[11] In this case, the conservation flow standards set forth in the Snowmaking Rules serve as one such constraint.

Section 16-03 of the Snowmaking Rules establishes the February median flow ("FMF") as a general conservation flow standard for fall/winter snowmaking withdrawals. Where a stream-specific value is unavailable, the statewide average value of 0.80 csm is used. The FMF standard is a conservative and protective limit that has been adopted by ANR to ensure protection and restoration of aquatic habitat, aquatic biota, and fish. ANR has employed the FMF limitation in the context of snowmaking water withdrawals to ensure that water uses for snowmaking purposes do not compromise the water quality of Vermont waters.

[11] It is axiomatic that neither the Board nor ANR could authorize under an application of the Snowmaking Rules any activity which would violate the VWQS. See 10 V.S.A. §1032 and §16-01 of the Snowmaking Rules.

The Board concludes that either the statewide average value of 0.80 csm, or a stream-specific FMF value derived pursuant to Appendix A of the Snowmaking Rules, *Stream Hydrologic Analysis, will* afford adequate resource conservative flow constraints to support high quality aquatic habitat during the period of Killington's operation,

Section 16-06 of the Snowmaking Rules defines the water use limitation for new systems. The limitation is 50 percent of the portion of the water between 0.80 csm (or the site-specific February median flow once determined) and 1.4 csm from October 1 to November 30 and 50 percent of the portion of the water between 0.80 csm (or the site-specific February median flow) and 1.1 csm from December 1 to March 3 1, plus any portion of the river flow in excess of the 1.4 csm or 1.1 csm. After ten years of collecting hydrologic data at the withdrawal point, the site-specific February median flow is to be calculated and instituted as the conservation flow requirement to assure that "the applicant shall not withdraw any water that would cause the stream to be below the site specific FMF at the point of the outtake." Both of the withdrawals proposed in the Woodward Reservoir Project are new systems under the Snowmaking Rules.

Killington has demonstrated compliance withall applicable water conservation measures, water use efficiency and ground water alternatives including those set forth in the Snowmaking Rules, Section 16-03(4) of the Snowmaking Rules provides for periodic review of alternatives analyses, after the initial permit is issued, in order to determine if an opportunity exists to improve the conservation flow requirements. Such reviews benefit from having better records available as to actual water use characteristics for the system that was permitted, allowing refinement of the water demand model. Moreover, Condition C of the attached Certification requires the derivation of a site-specific conservation flow from 10 years of collected data at the site of the intakes. If such site-specific FMF values exceed the 0.8 statewide average at any intake, then the site-specific values will become the minimum conservation flow for that source beginning in the eleventh year of the Certification. The duration of the attached permit and Certification also ensures a comprehensive review not later than 15 years from the issuance of this Decision.

b. 10 V.S.A. § 1250

For the reasons discussed above concerning compliance with the VWQS, and based on the accompanying findings of fact, the Board concludes that the

Woodward Reservoir Project is also consistent with the policies enumerated in 10 V.S.A. §1250. With regard to subsection 1250(6), Woodward Reservoir, Reservoir Brook, and Madden Brook do not constitute fragile high-altitude waters.

D. ENCROACHMENT PERMIT

Under 29 V.S.A. §§ 401-409, a permit must be obtained before constructing a new encroachment, or enlarging, extending or adding to an existing encroachment. The DEC makes the initial determination with regard to the new or enlarged encroachment relative to the public good and the public trust. Thereafter, any person aggrieved by the DEC decision may appeal to the Board. The Board may issue an order affirming, modifying or reversing the DEC's action, See §406(c). The Board has the authority under 29 V.S.A. §§ 407 and 408 to include any permit conditions it considers necessary to protect the public good or the public trust. See Re: Appeal of Fred Fayette, No. 91-08, Order at 3-4 (Mar. 16, 1992).

The Board will evaluate the Woodward Reservoir Project's impacts upon the "public good" before considering the Woodward Reservoir Project in light of the public trust doctrine. In Re: Kevin Rose and the Champlain Kayak Club, Docket No. MLP-96-01, Fmdings of Fact, Conclusions of Law, and Order at 11 (Nov. 7, 1996). If the Project will have an adverse affect upon the public good, then this statutory analysis is dispositive and the Board will not reach the issue of the public trust doctrine. Id at 12.

I,' 29 V.S.A §405(b) Public Good Criteria

With regard to the public good, 29 V.S.A. § 401 provides, in part:

> Lakes and ponds which are public waters of Vermont and the lands lying thereunder are a public trust, and it is the policy of the state that these waters and the lands shall be managed to serve the public good, as defined by section 405 of this title, to the extent authorized by statute

Except under very limited circumstances, "no person shall encroach on any of those waters and lands of lakes and ponds under the jurisdiction of the board without first obtaining a permit under this chapter." 29 V.S.A. § 403(a). Under Section 403(a), the Board may reverse the action of DEC and void Permit #97-26 "if the encroachment adversely affects the public good." Id. The "public good" is "that which shall be for the greatest benefit of the people of the state of Vermont." 29 V.S.A. § 402(6). Section

405(b) specifies certain elements which must be considered to determine whether the encroachment will adversely affect the public good:

> In determining whether the encroachment will adversely affect the public good, the department shall consider the effect of the proposed encroachment as well as the potential cumulative effect of existing encroachments on water quality, fish and wildlife habitat, aquatic and shoreline vegetation, navigation and other recreational and public use, including fishing and swimming, consistency with the natural surroundings and consistency with municipal shore land zoning ordinances or any applicable state plans.

While the Board must consider the public good elements listed in 29 V.S.A. § 405(b), it is not required to make an affirmative finding and conclusion with regard to each public good element. Rather, 29 V.S.A. § 405(b) sets out the elements to be considered, and no single element is dispositive of whether the encroachment adversely affects the public good. See In Re: Angney, No, S96-91 LaCa, Opinion and Order at 4 (Sept. 4, 1992). Under 29 V.S.A. §405(b), in determining whether the encroachment will adversely affect the public good, the Board considers the effect of the proposed encroachment, as well as the potential cumulative effect of existing encroachments, on water quality, fish and wildlife habitat, aquatic and shoreline vegetation, navigation and other recreational and public uses, including fishing and swimming, consistency with the natural surroundings and consistency with municipal shoreland zoning ordinances or any applicable state plans.

The encroachment upon the Woodward Reservoir will not adversely affect the public good as the encroachment will not adversely affect the water quality, aquatic habitat, shoreline vegetation, or the recreational and other public uses of the Reservoir. Moreover, the Woodward Reservoir Project will be both consistent with the natural surroundings, and consistent with municipal shoreland zoning ordinances or any applicable state plans.

The Woodward Reservoir Project will not result in adverse impacts to aquatic and shoreline vegetation, and instead is likely to provide an improvement as compared with existing conditions.

Killington's management of the Reservoir for snowmaking will not exacerbate shoreline erosion. The Reservoir bed in the drawdown zone is generally well-armored with coarse soils and stone. Unlike the topsoil and fine surficial soils originally flooded by the creation of the Reservoir that have long since eroded, the present Reservoir bed is

not likely to contribute sediment to the Reservoir, Information submitted by Killington also indicated that there will not be excessive ice movement as the Reservoir level is drawn down. Rather, due to the incremental change in the Reservoir level, the ice will slowly collapse and lay on the exposed Reservoir bottom as the water level drops. This will provide some protection of the shoreline area.

Identified public uses of the Reservoir during the winter are travel by skis, snowshoes, snow machines, and all terrain vehicles. Limited walking, ice fishing and ice skating have also been observed on the Reservoir. Excessive ice movement will not occur, thus enabling these and other winter uses of the Reservoir to continue.

There will be minimal impact on navigation, fishing and other public uses during construction. Once construction is completed, the physical presence of the water withdrawal system will not impact navigation, boating, fishing, swimming, winter recreation, or other public uses. Overall, the project will not result in adverse impacts to navigation, recreation, or other public uses. Ice safety will not be unreasonably compromised. Further, there will be, on average, a larger ice surface and pool than has historically been present for recreational uses,

The reduced magnitude of the Proposed Drawdown Regime and the later start date of the drawdown (as late as early January rather than early November) will improve the aesthetics of the Reservoir by reducing the amount of exposed shoreline area and reducing such exposure primarily to the period during which snow typically covers the ground. In general, the Board concludes that Woodward Reservoir Project is consistent with the natural surroundings.

No less intrusive feasible alternative was identified that will provide the needed water for snowmaking. Killington's Snowmaking Water Supply Needs and Alternatives Analysis indicated that the Reservoir is a suitable source of water for snowmaking.

Based upon the above findings and conclusions, the Board concludes that the cumulative impact of the proposed Project will not adversely affect the public good.

2. Public Trust Doctrine

The Board has previously ruled that it has a duty, independent of the public good determination, to assure the protection of public trust uses. In re: Dean Leary, Docket No. MLP-94-08, Memorandum of Decision at 4 (April 13, 1995). In Dean Leary, the Board stated:

> As a part of State government, the Board has a fiduciary obligation under the public trust doctrine to determine that encroachments will not have a detrimental effect on public trust uses. Hazen v. Perkins, 92 Vt. 414 (1918); State v. Malmquist, 114 Vt. 96 (1944); In re Establishment of Water Levels of Lake Seymour, 117 Vt. 367 (1952); State of Vermont v. Central Vermont Railway, Inc., 153 Vt. 337 (1989). In making this determination, the Board may rely on the guidance provided by case law both from this jurisdiction and other jurisdictions recognizing the public trust doctrine. In many instances, the uses identified in 29 V.S.A. § 405 are identical to the uses protected by the public trust.

Id at 5.

Identified public uses of the Reservoir during the winter period in which Killington will control the Reservoir levels and operate the withdrawal intake that is the subject of the Encroachment Permit include travel by skis, snowshoes, snow machines, and all terrain vehicles. Limited walking, ice fishing and ice skating have also been observed on the Reservoir. As discussed above, excessive and/or unsafe ice movement will not occur, thus enabling winter uses of the Reservoir to continue virtually unimpacted by either the intake structure or the resulting water level fluctuations. The Woodward Reservoir Project will have a minimal, if any, adverse impact on public trust uses of the Reservoir.

With regard to the public benefits of the Woodward Reservoir Project, those benefits associated with the installation of the dry hydrant are designed to improve public safety and will ensure that sufficient water is available to fight any fires that might occur in the area during the period of hydrant operation. The restoration of streamflows in Reservoir Brook as well as Killington's existing withdrawals at Roaring Brook, Falls Brook, and the Ottauquechee River is facilitated by the Woodward Reservoir Project. Notwithstanding the public benefits that will result from the conservation flows required by the attached Certification, those benefits, to the extent they are necessary to ensure high quality habitat for aquatic biota, fish, and wildlife, are required as a component of the VWQS and do not, of themselves, constitute a "public benefit." Rather, the conservation flows required by the specific conditions of the attached Certification are requirements without which the Board would not have affirmatively concluded that the Woodward Reservoir Project complied with §3-03(A)(1) of the VWQS.

Killington will also maintain a guaranteed minimum flow of water to Reservoir Brook while Reservoir water level management is under its control, irrespective of inflow to the Reservoir. This will improve and protect aquatic habitat in the brook.

The proposed Woodward Reservoir Project will not negatively impact traditional public trust uses of the Reservoir, and will provide at least those public benefits of assisting tirefighting resources. Potentially, through less direct means, the Woodward Reservoir Project may promote the viability of Killington's business operations by allowing an enhancement in its snowmaking resources. The impact of such enhancement may filter down to other aspects of the local economy to the extent that the Woodward Reservoir Project provides other broad-based public benefits. The Board, however, declines to specifically so conclude. In view of the public benefit associated with the supplemental firefighting resources, and the Board's conclusion that the Woodward Reservoir Project will not adversely affect the public good, the Board concludes that the Project is consistent with the public trust doctrine.

VII. ORDER

The Board hereby orders the following:

1. Lakes and Ponds (Encroachment) Permit #97-26 is affirmed and reinstated with modifications to Conditions 8, 15, and 24, and the deletion of Condition 26.

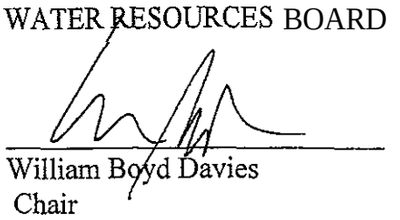
2. The §401 Water Quality Certification dated November 21, 1997 is vacated and superseded by the attached §401 Water Quality Certification.

3. Jurisdiction is returned to ANR.

It is so ordered.

Dated at Montpelier, Vermont on this 14th day of August, 1998

WATER RESOURCES BOARD



William Boyd Davies
Chair

Concurring:
Ruth Einstein
Jane Potvin
Gail Osherenko
Gerry Gossens