

In accordance with 10 V.S.A. § 1263a(e), the Town of Sudbury (Applicant and Permittee) and Aquatic Control Technology, Inc. (Co-Applicant and Co-Permittee) are authorized to use Renovate 3 and Renovate OTF in Lake Hortonia in compliance with the following conditions. Unless otherwise specified, the term “treatment” in these conditions refers to a single treatment of the waterbody with Renovate.

1. This permit is valid upon signing and shall expire five years from the date of signing (see conditions 2, 3, 5 and 6 for the timeframe of the authorized control activity).
2. In one of the years 2008 or 2009, the Permittee and Co-Permittee are authorized to conduct one spot/partial-lake treatment of up to 30.6 acres total in Areas Ta, Td, Te and Tf, and upon fulfillment of the requirements in condition 4 below, one spot/partial-lake treatment of up to 29.9 acres in Areas Ca, Cb, Cc, Cd and Ce in Lake Hortonia (Attachment C), as soon as the watermilfoil is actively growing prior to the water temperature reaching 60 degrees, or after June 22, with the aquatic herbicide, Renovate OTF, active ingredient triclopyr, EPA Registration No. 67690-42, to achieve a target triclopyr concentration of 1.75 parts per million in the bottom four feet of water depth. The areas approved by the Department are described in Attachment C.
3. In one of the years 2008 or 2009, the Permittee and Co-Permittee are authorized to conduct one spot/partial-lake treatment of up to 15.5 acres in areas Tb and Tc in Lake Hortonia (Attachment C) as soon as the watermilfoil is actively growing prior to the water temperature reaching 60 degrees, or after June 22, with the aquatic herbicide, Renovate 3, active ingredient triclopyr, EPA Registration No. 67690-42, to achieve a target triclopyr concentration of 1.0 part per million. The areas approved by the Department are described in Attachment C.
4. Prior to treating contingency Areas Ca, Cb, Cc, Cd and Ce with Renovate OTF, the Permittee and Co-Permittee shall document the need to treat each area. Such documentation must show evidence of a level of watermilfoil growth in each area to be treated that is too extensive to be controlled by non-chemical control methods, and shall include a detailed description of watermilfoil growth with text describing the extent of growth and accompanying map(s) identifying the extent of growth in each area. Once the Permittee and Co-Permittee have documented that the watermilfoil growth in a contingency area is too extensive to be controlled by non-chemical control methods, the Permittee and Co-Permittee may proceed with a treatment in that contingency area in accordance with the conditions of this permit. The Permittee and Co-Permittee shall provide the documentation supporting the need to treat to the Department with (and as part of) the herbicide application record form required by condition 11, below.
5. If treatment is to occur after June 22, the Co-Permittee shall conduct a pre-treatment survey to determine the growth stage of the watermilfoil in all areas to be treated. If the watermilfoil is fully grown or to the water surface in any area, no treatment shall occur in that area.
6. The treatment shall only occur on a Monday, Tuesday, Wednesday or Thursday to avoid the need to close Lake Hortonia to recreational use over a weekend. If an early-May treatment can be scheduled, the Department, upon request and in consultation with the Vermont Department of Fish and Wildlife, may grant written authority for the treatment to occur on a Friday, Saturday and/or Sunday.
7. The Co-Permittee shall take adequate precautions to assure that no off-target drift of Renovate OTF blows onto the shoreland.

8. The specific products used, Renovate 3 and Renovate OTF, must be registered with the Vermont Agency of Agriculture, Food and Markets for use in Vermont at the time of the treatment, and shall be applied in full conformance with all label requirements and state and federal regulations in effect at the time of the treatment.
9. The disposal of surplus Renovate, container rinseate, and empty product containers shall be conducted according to product label requirements and federal and state law and regulations.
10. Renovate shall only be applied by a pesticide applicator certified by the Vermont Agency of Agriculture, Food and Markets in Category Five - Aquatics, and only by a Co-Permittee of this permit. Renovate shall only be applied in the presence of someone with prior experience in its application.
11. The Permittee and Co-Permittee shall submit to the Department an herbicide application record form (Attachment A) along with chemical treatment quantity calculations associated with the treatment within seven calendar days following the date of the Renovate treatment.
12. Prior to any treatment occurring in Lake Hortonia with equipment (e.g. airboat, boat, distribution equipment) that has been in or on any other waterbody, the Permittee and Co-Permittee shall provide the Department with written documentation that describes the spread prevention measures to be taken to assure that no non-native species will be transported into or out of Lake Hortonia with the project equipment. At a minimum, the Permittee and Co-Permittee shall ensure that the following occur before and after equipment is placed in Lake Hortonia: all visible plants, plant fragments, and animals shall be removed from the project equipment; all water from bilges, etc. on all project equipment (boats, motors, etc.) shall be drained; all project equipment shall be rinsed with water at a temperature at or above 140°F for a minimum of one minute and/or washed with an appropriate disinfectant; and all absorbent items that have come into contact with water (e.g. felt-bottom wading boots) shall be soaked in an appropriate disinfectant for a minimum of thirty minutes to ensure complete decontamination. As an alternative to rinsing or washing, the project equipment may be thoroughly dried and kept dry for at least five days before and after being placed in Lake Hortonia as a means of preventing the introduction of non-native species into or out of Lake Hortonia. Documentation of the spread prevention measures to be taken shall be submitted to the attention of Susan Brittin, Water Quality Division, either by Internet Susan.Brittin@state.vt.us or facsimile (802-241-4537). No project equipment shall be placed into Lake Hortonia until the Department has given the Permittee written approval of the spread prevention measures and those spread prevention measures have been implemented. No project equipment shall be removed from the Lake Hortonia shoreland until the approved spread prevention measures have been implemented. The Permittee shall be responsible for making certain that the party or parties using/transporting the project equipment adhere to the approved measures.
13. A duly authorized representative(s) of the Department may at any time inspect the project, including the operation and maintenance thereof. Agency of Natural Resources staff may boat on Lake Hortonia to conduct official business as soon as the Renovate application has been completed.
14. The Permittee shall notify the Department of the treatment date(s) via Internet (Susan.Brittin@state.vt.us) at least five days prior to the treatment taking place. A copy of the electronic message shall be sent to Shawn.Good@state.vt.us and Bob.Popp@state.vt.us. Alternatively, the Permittee may call Susan Brittin (802-241-3786), Shawn Good (802-786-3863)

and Bob Popp (802-476-0127) to notify them at least five days prior to the treatment taking place.

15. The five-year integrated management plan (IMP) approved in association with ANC Permit #2002-C04, as updated to include the 2008 Renovate treatment and as agreed to during annual meetings between the Permittee and the Department held in accordance with condition 16, below, shall apply to ANC Permit #2008-C01.
16. The Permittee shall meet with the Department annually regarding the results of the post-treatment aquatic plant surveys required in condition 29, below (in the year of treatment, and two consecutive years thereafter) to discuss the level of watermilfoil control achieved/maintained, the impacts to non-target species, and other pertinent issues as well as the most effective strategy to accomplish continued integrated management of Eurasian watermilfoil in Lake Hortonia.
17. The Permittee shall maintain all data and records relating to the activities authorized by this permit and the associated five-year integrated management plan until the expiration date of this permit. The Co-Permittee shall maintain all data and records relating to the Co-Permittee's obligations under this permit for a period of two years following completion of the Renovate treatment.
18. There shall be **no use** of Lake Hortonia and its outlet stream from the dam downstream to Route 144 for any purpose beginning the day of the Renovate treatment through the entire day after the treatment, which includes but is not limited to:
 - swimming/wading
 - boating
 - fishing
 - irrigation
 - domestic use, including toilet flushing.
19. There shall be **no irrigation use** of the water from Lake Hortonia and its outlet stream from the dam downstream to Route 144, including use for watering lawns, trees, shrubs or plants, beginning the day of the Renovate treatment and continuing for 120 days or until the Department provides notification to the Permittee that the restriction has been lifted, whichever comes first. [If lifted prior to 120 days, the Department intends to base lifting the irrigation use restriction on the results of chemical analyses of representative water samples, as specified in conditions 24 and 25 below, that indicate that the concentration of triclopyr is equal to or less than 1.0 part per billion by laboratory analysis.]
20. **Recreational uses such as swimming/wading, boating and fishing** may resume at the beginning of the **second** day following the Renovate treatment.
21. **Domestic uses other than** drinking and using waters to prepare food or drink may resume at the beginning of the **second** day following the Renovate treatment.
22. There shall be **no use of the water** from Lake Hortonia and its outlet stream from the dam downstream to Route 144 **for drinking or to prepare food or drink** beginning the day of the Renovate treatment and continuing until the Department provides notification to the Permittee that the restriction has been lifted. [The Department intends to base lifting this restriction on the results of chemical analyses of representative water samples, as specified in conditions 24 and 25 below, that indicate that the concentration of triclopyr is at or below 75 parts per billion by laboratory analysis.]

23. The Permittee shall supply bottled water for the duration of the required water use restriction to all persons affected by the restricted use of the waters for drinking and/or to prepare food or drink, unless other arrangements are made by those affected.
24. The Permittee and Co-Permittee shall collect water for the analysis of triclopyr from fourteen (14) sample sites in Lake Hortonia and the outlet stream as follows: one site in each of the Renovate 3 treatment areas Tb and Tc; one site in each Renovate OTF treatment area (Ta, Td, Te, Tf); one site in each treated contingency area (Ca, Cb, Cc, Cd, and Ce); two sites in open water outside of the treated areas; and one site in the outlet stream downstream at Route 144, all as shown in Attachment D. Renovate OTF treatment area samples shall be collected within the bottom four feet of water at the sample site using sampling equipment designed to collect samples at a discrete depth. Renovate 3 treatment area samples, the sample from the outlet stream at Route 144, and the two open-water untreated area samples shall be collected at elbow-depth into the water. All samples shall be collected beginning approximately 24 hours after completion of the Renovate treatment and continuing at least weekly until all sample results demonstrate that triclopyr is at or below 75 parts per billion by laboratory analysis. Sampling at one or more sites may be discontinued prior to this time if the Permittee and Co-Permittee receive prior written approval from the Department to discontinue the sampling. Additional sampling locations and samples may be required if sample results from the sampling site in the outlet stream of Lake Hortonia reveal detectable amounts of triclopyr.
25. Water samples collected in accordance with condition 24 above shall be analyzed at the SePRO Corporation laboratory or another laboratory qualified to analyze triclopyr. The Permittee and Co-Permittee shall submit all sampling results to the Department as described in condition 26, below. Individuals collecting water samples for analysis shall be trained directly by SePRO Corporation or the Co-Permittee.
26. The Permittee and Co-Permittee shall arrange for the laboratory performing the analyses to fax (fax number 802-241-4537, attn: Susan Brittin) or send via Internet (Susan.Brittin@state.vt.us) the sample results to the Department within 24 hours of completion of analysis.
27. The Permittee and Co-Permittee shall conduct public notification in the following manner:
 - a. An informational notice and map of the treated and restricted-use areas shall be hand-delivered or either sent with a stamped, Permittee contact-addressed return postcard or sent Certified Mail-Return Receipt, to all property owners of land that abuts Lake Hortonia and the outlet stream downstream to Route 144 as shown in Attachment C at least 15 days prior to the treatment taking place. A list of all property owners who were sent notices with a return postcard or via certified mail, and a list of those property owners who returned postcards/certified mail receipts, shall be provided to the Department no later than 5 days prior to the treatment taking place. A list of those property owners who did not return the postcards/certified mail receipts shall also be provided along with a photo of each posted notice or a detailed description of where and when the notice(s) were posted to ensure that each of these property owners who did not return postcards/certified mail receipts will receive the notice and map describing the treatment and water use restrictions. The informational notice shall include:
 - The proposed date of the treatment;
 - The aquatic herbicide to be used;
 - A map of the treated and restricted-use areas;
 - A statement that signs posted along shoreline properties and roadways will provide the exact treatment date/time;

- A statement that signs posted along shoreline properties and roadways will provide specific water use restriction dates;
- A list of all water use restrictions:
 - NO USE of Lake Hortonia and its outlet stream downstream to Rte. 144 FOR ANY PURPOSE, including boating, fishing, swimming, domestic (household) use or irrigation, on the day of and the entire day after the treatment.
 - Swimming/wading, boating, fishing and domestic use (**except drinking or for food or drink preparation**) may resume the beginning of the second day following treatment.
 - Use of water from Lake Hortonia or its outlet stream downstream to Rte. 144 for drinking or for food or drink preparation shall not resume until water sample analyses reveal that the active ingredient in Renovate OTF (triclopyr) is at or below 75 parts per billion by laboratory analysis.
 - Use of water from Lake Hortonia or its outlet stream downstream to Rte. 144 for irrigation, including use for watering lawns, trees, shrubs or plants, shall not resume for 120 days or until water sample analyses reveal that triclopyr is at or below 1.0 part per billion by laboratory analysis, whichever comes first;
- A statement that bottled water will be provided, if requested, to any person restricted from using their domestic water supply for drinking or in the preparation of food or drink; and
- The contact name(s), address(es), and telephone number(s) for the Permittee and Co-Permittee for further information.

The notice shall also state that notification of the exact treatment date will be posted in the locations described in condition 27c below. The notice shall inform property owners in bold print that if a residence or cottage will be rented at any time after the treatment and prior to December 31 of the year in which the treatment occurred, the property owner is responsible for informing all tenants of the treatment and the water use restrictions. A copy of the notice shall be provided to the Department when the notice is sent to property owners.

- b. The same informational notice described in condition 27a above shall be provided at least 15 days prior to the Renovate treatment to any commercial camps abutting Lake Hortonia or the outlet stream downstream to Rte. 144, and shall be provided, prior to the children attending, to all parents of children who will be attending the camps in the year of treatment. A list of those commercial camps shall be submitted to the Department prior to the treatment taking place.
- c. Signs and maps of the treated and restricted-use areas shall be posted (1) along the road facing the approaching traffic, at least once every 1000 feet along the lakeward side of the roadways in the vicinity of the Lake Hortonia shoreline and the downstream area restricted by the treatment; (2) at all public and private campgrounds, hotels, inns, beaches and access points where the public might enter or use the lake or restricted-use downstream area; and (3) at the Sudbury and Hubbardton town offices. The signs posted at locations (1) and (2), above, shall be at least 25 inches in height by 19 inches in width. The signs posted at location (3), above, shall be at least 11 inches in height by 8.5 inches in width. Signs at locations (1) and (2), above, shall be mounted on wood or similar material and staked into the ground at vehicle and/or eye level in locations where they will be most visible to shoreline property owners and potential lake users. All signs shall be made of waterproof paper and printed with waterproof ink. The signs shall state:

WARNING

AQUATIC PESTICIDE IN USE

There are water use restrictions on Lake Hortonia and its outlet stream from the dam downstream to Route 144 due to a treatment with the aquatic herbicide Renovate on _____ (date).

IN LAKE HORTONIA AND ITS OUTLET STREAM DOWNSTREAM TO ROUTE 144 THERE SHALL BE:

NO USE of the water **for ANY PURPOSE** the day of treatment and the entire day after treatment.

NO USE of the water for **Drinking or for Food or drink preparation** UNTIL FURTHER NOTICE (may resume on _____)

Domestic uses **OTHER THAN** drinking or food or drink preparation may resume on _____

NO USE of the water for Irrigation for 120 days (may resume on _____)

NO USE of the water for Recreation (swimming, boating, fishing) until the second day following the treatment (may resume on _____)

For information contact: _____
Permittee contact name/telephone number

The signs and maps shall be posted at least 24 hours prior to the Renovate treatment. A representative copy of the sign and map shall be provided to the Department when the signs and maps are posted. When water use restrictions have been lifted, the signs shall be updated to indicate which use of the waters may resume as of the date specified by the Department.

- d. When all use restrictions have been lifted by the Department, the Permittee and Co-Permittee shall clearly indicate on all signs (or replace all signs described in condition 27c above with signs of the same type and size(s) and posted at the same locations that state) that the aquatic herbicide treatment is completed, all water use restrictions have been lifted, and all normal uses are again allowed. These signs shall remain posted for a minimum of two weeks. The Permittee and Co-Permittee shall remove the signs after the two-week period has passed. The signs shall remain posted for no longer than four weeks after all water use restrictions have been lifted.
28. The Permittee shall submit to the Department three copies of an annual report on the treated areas, and any other areas where sample analysis showed the concentration of Renovate was at or above the treatment target concentration (collectively termed "Renovate-treated areas"), in the year of Renovate treatment and for two consecutive years thereafter on or before December 31 of each year. An extension of time may be granted for cause. A request for an extension must be received by the Department prior to the December 31 due date. The annual report shall include (a) a qualitative assessment of the status of Eurasian watermilfoil growth and distribution in the Renovate-treated areas; (b) a map of the Renovate-treated areas with

Eurasian watermilfoil growth and distribution depicted; and (c) a log of the non-chemical control strategies used in the Renovate-treated areas including the dates, activity, length of time spent, and the names of the individuals conducting the activity.

29. The Permittee shall conduct three post-treatment qualitative aquatic plant surveys of the Renovate treated areas using the same survey methods and during approximately the same time period each year (late August to mid-September) as the annual plant surveys that have been conducted by Darrin Fresh Water Institute in compliance with ANC Permit #2002-C04 for comparative purposes. The post-treatment plant surveys shall occur in the year of treatment and two consecutive years thereafter. The Permittee shall submit three copies of a report to the Department within 45 calendar days following each post-treatment plant survey. The report shall include at a minimum (a) the date(s) of the post-treatment survey; (b) the names of survey crew members; (c) treatment effectiveness on Eurasian watermilfoil; (d) general impacts on non-target aquatic plants in the Renovate-treated areas and specific information on impacts to *Brasenia schreberi*, *Ceratophyllum demersum*, *Elodea canadensis*, *Elodea nuttallii*, *Megalodonta beckii*, *Myriophyllum sibiricum*, *Nuphar variegata*, *Nymphaea odorata*, *Polygonum* sp., *Pontederia cordata*, *Potamogeton amplifolius*, *Potamogeton epiphydrus*, *Potamogeton gramineus*, *Potamogeton zosteriformis*, *Ranunculus longirostris*, *Sparganium natans*, *Utricularia geminiscapa*, *Utricularia gibba*, *Utricularia minor*, *Utricularia vulgaris* and *Zosterella dubia*; and (e) a map depicting specific areas surveyed, with associated text describing species present and their abundance (include abundance key) for each area.
30. The Permittee and Co-Permittee shall conduct the Renovate treatment and implement the updated associated integrated management plan as described in ANC Permit #2002-C04 and in Finding 6 (Long-range Management Plan) of this permit in strict accordance with the permit application dated January 23, 2008 (Co-Applicant) and January 26, 2008 (Applicant) and received on January 30, 2008; additional required materials received February 12, 2008 and March 2, 2008; the following Findings; and the conditions of this permit, with such minor modifications as may be approved in writing by the Department.
31. In the event that Aquatic Control Technology, Inc. represented herein by Gerald Smith is not the project applicator, the new project applicator shall become the Co-Permittee, submit the required documentation (see Attachment B) to the Department, and receive written authorization from the Department to become the Co-Permittee before performing any and all activities authorized or required of the Co-Permittee under this permit.
32. This permit may be modified for cause upon written request for modification that contains facts or reasons supporting the request, or upon the Department's own motion. If the Department determines that modification is appropriate, only the conditions subject to modification shall be reopened. Any modification under this condition shall be performed in accordance with the public notice requirements of the *Public Review and Comment Procedures for Aquatic Nuisance Control Permit Applications and General Permits* under 10 V.S.A. § 1263a dated January 30, 2003 and approved by the Secretary of the Agency of Natural Resources on February 18, 2003. Cause for modification of this permit includes, but shall not be limited to:
 - a. Alterations to the activities authorized by this permit which occurred after permit issuance and which justify the application of conditions that are different or absent in the existing permit; or
 - b. The receipt of information concerning the activities authorized by this permit which was not available at the time the permit was issued and which would have justified different permit requirements at the time of permit issuance.

33. After notice and opportunity for a hearing, this permit may be suspended or revoked for cause in whole or in part, upon a written request for suspension or revocation which contains facts or reasons supporting the request, or upon the Department's own motion. Cause for suspension or revocation includes:
 - a. Violation of any of the terms or conditions of this permit;
 - b. Failure by the Permittee or Co-Permittee to disclose all relevant facts during the permit application process;
 - c. Misrepresentation of any relevant fact or providing false information at any time during the permit application process;
 - d. A determination by the Department that a reasonable non-chemical alternative is available;
 - e. A determination by the Department that the risk to public health resulting from the activities authorized by this permit is more than negligible;
 - f. A determination by the Department that the risk to the non-target environment resulting from the activities authorized by this permit is unacceptable; or
 - g. A determination by the Department that this activity does not provide a public benefit.
34. Nothing in this permit shall be construed to relieve the Permittee, Co-Permittee or their agent(s) from civil or criminal penalties for noncompliance with the conditions of this permit.
35. Nothing in this permit shall be construed as having relieved, modified, or in any manner affected the Permittee's obligation to comply with all other federal, state or local statutes, regulations or directives applicable to the Permittee, nor does it relieve the Permittee of the obligation to obtain all necessary state, local and federal permits.
36. Issuance of this permit does not convey any property rights in either real or personal property, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations.
37. The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby.
38. If a permit renewal is desired, an application should be filed at least 180 days prior to the expiration date of this permit. A decision to issue or deny a permit will be based on the relevant statutory criteria and Department rules, procedures and policies prevailing at that time.

FINDINGS

The Department has reviewed all the information received from the Town of Sudbury (Applicant), Aquatic Control Technology, Inc. (Co-Applicant), and others relative to the proposed project to use Renovate 3 and Renovate OTF in Lake Hortonia in support of the Lake Hortonia Property Owners Association's efforts to control Eurasian watermilfoil re-growth and makes the following Findings as required under 10 V.S.A. § 1263a(e).

1. Jurisdiction

Lake Hortonia is located in Sudbury and Hubbardton, Vermont. Lake Hortonia is designated as waters of the state. Since the proposed activity is to use an aquatic pesticide to control an aquatic nuisance in portions of these waters, the Secretary of the Agency of Natural Resources has jurisdiction under 10 V.S.A. § 1263a. Furthermore, 10 V.S.A. § 1263a(e) directs the Secretary to issue a permit for pesticide use when the Secretary can make the following five findings:

- 1) There is no reasonable non-chemical alternative available;
- 2) There is acceptable risk to the non-target environment;
- 3) There is negligible risk to public health;
- 4) A long-range management plan has been developed which incorporates a schedule of pesticide minimization; and
- 5) There is a public benefit to be achieved from the application of the pesticide, or in the case of a pond located entirely on a landowner's property, no undue adverse effect upon the public good.

The Secretary has designated the Commissioner of the Department of Environmental Conservation or the Commissioner's designated representative to act on the Secretary's behalf in the issuance or denial of these permits.

2. Background and General Description

Lake Hortonia is a 480-acre waterbody with a maximum depth of 62 feet. The lake has one outlet that flows southwest into the Hubbardton River and eventually into Lake Champlain.

Eurasian watermilfoil was first confirmed in Lake Hortonia in 1984. Numerous non-chemical control methods for Eurasian watermilfoil have been used since that time, including benthic barrier installation, handpulling, lake water level drawdown, and mechanical harvesting. The Lake Hortonia Property Owners Association and shoreline property owners have conducted non-chemical control methods, with some assistance from the Department.

Aquatic Nuisance Control Permit #1998-C03 was issued on December 27, 1999 to the Lake Hortonia Property Owners Association and the Burr Pond Association for the use of Sonar A.S. (active ingredient fluridone) in a whole-lake treatment of Lake Hortonia and Burr Pond. The treatment took place in the spring of 2000. The target concentration for the treatment was 6 parts per billion with a concentration of at least 3 parts per billion to be maintained for a period of at least 45 days. The treatment did not result in long-lasting control of the watermilfoil in either waterbody. Overall the treatment was deemed successful at reducing levels of watermilfoil in the year of treatment by at least 90% in Lake Hortonia and Burr Pond, while causing no significant direct impacts to the majority of non-target aquatic and wetland plants, even in the year of treatment. However, by year two post-treatment, watermilfoil had re-infested Lake Hortonia and Burr Pond, and by 2003, the frequency of occurrence of Eurasian watermilfoil (49% in Burr Pond and 52% in Lake Hortonia) had returned to near 1999 levels (57% in Burr Pond and 54% in Lake Hortonia).

In 2003, the Lake Hortonia Property Owners Association and the Burr Pond Association completed a permit application for a second whole-lake treatment using Sonar A.S. and proposed a five-year plan combining the use of chemical and non-chemical methods to manage watermilfoil in Lake Hortonia and Burr Pond. The chemical component of the plan involved the use of Sonar A.S. in a whole-lake treatment in year one with a target concentration of 8 parts per billion, with at least 5 parts per billion to be maintained for a period of at least 90 days, to reduce the watermilfoil population, followed if needed in years four and/or five with spot or partial-lake chemical treatment using Sonar SRP, Renovate or another product registered for use in the state of Vermont in the

event that the initial Sonar A.S. treatment and the non-chemical control methods employed did not effectively control the watermilfoil in years four and five. The non-chemical components of the plan included handpulling in years two through four, education and volunteer training in all five years, and benthic barrier installation in years four and five if necessary. Aquatic Nuisance Control Permit #2002-C04 was issued on March 31, 2004 and a second whole-lake treatment of Lake Hortonia and Burr Pond with Sonar A.S. was conducted during the summer of 2004.

The 2004 whole-lake chemical treatment and follow-up non-chemical control methods conducted by the Lake Hortonia Property Owners Association were successful at controlling Eurasian watermilfoil re-growth in Lake Hortonia except in four areas. In September 2005, Eurasian watermilfoil plants were found with only a 2.2% frequency of occurrence lakewide and with a 7.9% frequency of occurrence in the associated wetlands in Lake Hortonia. Eurasian watermilfoil plants were found in only 2% of the survey points in the non-wetland area of the lake less than 13 feet deep. However, many thousands of watermilfoil plants were found within each of four areas of the lake ranging in size from approximately 3.5 acres to 9.5 acres, together totaling approximately 23 acres. In November 2005, the Applicant submitted an application to the Department for the use of Renovate 3 in the four areas in Lake Hortonia where the re-growth could not feasibly be controlled by handpulling or benthic barriers. Aquatic Nuisance Control Permit #2005-C02 was issued on June 7, 2006 and a spot/partial lake treatment of the four areas, totaling 23 acres, was conducted on July 11, 2006 using Renovate 3 with a target triclopyr concentration of 1.5 to 1.75 parts per million.

A post-treatment watermilfoil survey was conducted by ACT, Inc. (Co-Applicant) on August 9, 2006. The survey report indicated no viable watermilfoil was observed anywhere within the four treated areas. The non-target plants in Area 1 were abundant with a near continuous bottom cover as well as a good plant biomass in the water column. The water lilies (*Nymphaea* sp. and *Nuphar* sp.) were somewhat impacted by the Renovate treatment, more so in the far northern, shallow end of the treated cove. The majority of the water lily cover, however, remained unharmed by the treatment. The cover and biomass of non-target native plants in Area 2 were also good. Control of watermilfoil extended approximately 100 -150 feet west of the treatment area boundary. This movement of Renovate 3 and ultimate control of watermilfoil in an adjacent area of scattered growth was positive, especially with the boat traffic moving through this area from the public boat launch. Some impact to water lily stems was visible in the northeastern corner of the treatment area, but the overall impact to water lily cover and biomass was minimal. Similar results were observed in Area 3, with no viable watermilfoil and good non-target plant cover. In Area 4, greater impact to the water lilies was observed, as well as some impact to pickerelweed (*Pontederia* sp.) within the very shallow, protected southern end of the cove. The other non-target plant populations in Area 4 were found to be abundant.

At the time of the early-August 2006 watermilfoil survey, the Co-Applicant did not foresee that there would be a need for an herbicide treatment in Lake Hortonia in 2007. However, late-season Eurasian watermilfoil growth was noticed after the August 2006 survey performed by ACT, Inc., and in February 2007, the Applicant and Co-Applicant submitted an application to the Department for the use of Renovate OTF in six areas of Lake Hortonia where it was anticipated that watermilfoil re-growth would not be controllable by handpulling or benthic barriers by spring 2007.

On June 28, 2007, the Co-Applicant surveyed the six areas proposed for treatment and determined that Eurasian watermilfoil growth in two entire areas and in half of two other areas did not warrant chemical treatment. The Co-Applicant indicated that Eurasian watermilfoil coverage in the remaining areas (Area 1, Area 3 – southern portion, Area 5, and Area 6 – western portion) exceeded the capacity for divers to successfully manage the growth through handpulling. Use of the aquatic herbicide Renovate OTF in these four areas would enable handpulling efforts to be focused on the sparse or widely scattered Eurasian watermilfoil re-growth present elsewhere in Lake Hortonia.

ANC Permit #2007-C04 was issued on July 16, 2007, authorizing the use of Renovate OTF in four areas of Lake Hortonia totaling 12.5 acres. The Renovate OTF treatment occurred on July 31, 2007 with a target triclopyr concentration of 1.75 parts per million in the bottom four feet of water depth.

The August 2007 post-treatment aquatic plant survey revealed that of the four areas treated in 2007 (Areas 1, 3, 5 and 6), control achieved in Area 1 was generally poor. ACT, Inc. indicated this may have been due to the fact that the configuration and water depth of Area 1 caused it to be more prone to dilution and movement of the herbicide away from the targeted area.

Control in Area 3 was excellent even though Area 3 was a smaller bed and had a long narrow configuration. Native plants were observed covering almost 100% of the bottom in Area 3 post-treatment with both “low growing” and “higher profile” plants in abundance.

Control in Area 5 was very good, although perhaps not quite as good as in Areas 3 (above) and 6 (below). There was an estimated 85-90% reduction in the watermilfoil post-treatment. Some widely scattered, damaged watermilfoil was also observed at the time of the survey. Native plants were observed covering almost 100% of the bottom in Area 5 post-treatment, with both “low growing” and “higher profile” plants in abundance.

In Area 6, the smallest of the four areas treated in 2007 in Lake Hortonia, Eurasian watermilfoil control was also excellent with greater than 95% reduction occurring. Native plant cover remained extensive post-treatment.

Based on Lake Hortonia shoreline residents’ testimony regarding explosive watermilfoil growth in a relatively short amount of time at the end of August-beginning of September, Act, Inc. conducted a follow-up watermilfoil survey on September 12, 2007. The survey was conducted around the entire lake shoreline, identifying areas of Eurasian watermilfoil growth, noting watermilfoil relative percent cover, and identifying the areas that would likely require Renovate treatment in 2008. The Co-Applicant estimated there was approximately 56 acres of watermilfoil too extensive or abundant for efficient and economical use of non-chemical control methods such as diver handpulling or suction harvesting. An additional 20 acres was marked as contingency treatment areas to be revisited in the early spring of 2008.

Based on the survey information and following discussions with a contractor regarding the potential to control the Eurasian watermilfoil growth in areas of the lake using suction harvesting, the Applicant and Co-Applicant submitted a permit application on January 30, 2008 requesting the use of Renovate 3 and Renovate OTF in a spot/partial-lake treatment in six areas totaling 46.1 acres (Areas Ta, Tb, Tc, Td, Te and Tf) with an additional five areas totaling 29.9 acres (Areas Ca, Cb, Cc, Cd and Ce) designated as contingency areas to be revisited in early spring 2008 for confirmation of the need to treat. The Applicant has also submitted an application for an Aquatic Nuisance Control Permit to use suction harvesting in the designated contingency areas. The Applicant indicated that a determination regarding the appropriate control method (Renovate OTF treatment or suction harvesting) to use in each of the contingency areas would be based on a very-early-season watermilfoil survey in 2008. If the survey reveals that the watermilfoil growth in one or more of the contingency areas is too dense to be effectively controlled with suction harvesting, the Applicant intends to include that area(s) in the Renovate treatment proposed for 2008. Otherwise, the Applicant intends to control the watermilfoil in the contingency area(s) using suction harvesting.

A. Aquatic Herbicide Description

Renovate 3 is a U.S. Environmental Protection Agency-registered aquatic pesticide (EPA

Registration No. 62719-37-67690). Manufactured as an aqueous solution by SePRO Corporation, the active ingredient in Renovate 3 is triclopyr: [(3,5,6-trichloro-2-pyridinyl) oxy]acetic acid, triethylamine salt. Triclopyr comprises 44.4 percent of the formulation. Inert ingredients comprise the remaining 55.6 percent of the formulation. The inert ingredients are known to the Vermont Agency of Agriculture, Food and Markets, and the Vermont Department of Health (DOH).

The Renovate 3 label indicates that Renovate 3 can be applied as either a surface or subsurface application to control Eurasian watermilfoil. The Co-Applicant intends to apply Renovate 3 as a subsurface application through weighted hoses on a boat-mounted distribution system.

Renovate On Target Flakes (OTF) is a U.S. Environmental Protection Agency-registered aquatic pesticide (EPA Registration No. 67690-42). Manufactured as a flake formulation by SePRO Corporation, the active ingredient in Renovate OTF is triclopyr: [(3,5,6-trichloro-2-pyridinyl) oxy]acetic acid, triethylamine salt. Triclopyr comprises 14 percent of the formulation. Inert ingredients comprise the remaining 86 percent of the formulation. The inert ingredients are known to the Vermont Agency of Agriculture, Food and Markets, and the DOH.

On January 25, 2008, the Department requested Confidential Statement of Formula (CSF) information from SePRO Corporation regarding a stated change to the inert ingredients/carrier formulation for Renovate OTF. On February 6, 2008, the Department received the information and forwarded it to the DOH for their review. The DOH found no change in formulation indicated in the materials provided by SePRO staff. Following a request for clarification, additional materials missing from the original submittal were received by the Department from SePRO staff on February 15, 2008 and forwarded to the DOH. The DOH indicated via a February 15, 2008 electronic message that the change in formulation would not result in any change from the comments DOH provided for previous Renovate OTF permit applications. The DOH provided comments on the Applicant's current application (#2008-C01) as noted in Section 5 of this document.

The Renovate OTF label indicates that the product should be applied as a surface application using mechanical or portable granule-spreading equipment to control Eurasian watermilfoil. As in 2007, the product will be evenly applied throughout the treatment areas at the prescribed treatment dose. The 2007 application was conducted using a granular blower system. The Co-Applicant has proposed a different type of equipment be used for delivering the product to the waterbody in 2008 to reduce the potential for off-target drift. The flake will be sprayed over the surface of the water in a stream of water using a calibrated eductor system. This should help limit dust and the potential for off-target drift. However, the granular blower system used in 2007 will be the backup system in the event that there is a problem with the eductor/injector system.

Renovate 3 and Renovate OTF have the same active ingredient, triclopyr. Triclopyr is a selective broadleaf herbicide that can be used to control a variety of nuisance and invasive aquatic plant species in ponds, lakes, reservoirs, marshes, wetlands and non-irrigation ditches or canals. Triclopyr rapidly enters through a plant's leaves and stems, then translocates down into the roots, disrupting the plant's metabolism. Triclopyr should be applied when Eurasian watermilfoil is actively growing.

Replicated pond studies conducted by SePRO at their Research and Technology Campus in 2006 indicate that approximately 50% of the triclopyr is released from the Renovate OTF flakes in less than an hour, with the remainder of the triclopyr released within 24 - 48 hours.

Laboratory tests show that photodegradation is a major route of triclopyr degradation in aquatic environments. Field dissipation studies indicate that microbial degradation is also important. Field and whole pond studies indicate that the first order half life for Renovate 3 and Renovate OTF

(once the product has released from the flakes) in the aquatic environment ranges from 0.5 to 7.5 days.

Unlike Sonar A.S., active ingredient fluridone, which typically requires a contact time of up to 90 days or more to be effective on Eurasian watermilfoil, triclopyr is taken up by the plants in just 1 to 2 days, with control of Eurasian watermilfoil generally seen within approximately 3 to 4 weeks.

Triclopyr is highly selective for Eurasian watermilfoil and other dicot (broadleaf) plants so impacts to non-target species are anticipated by the Applicant and Co-Applicant to be minimal.

B. Proposed Chemical Treatment Plan

The Applicant and Co-Applicant are proposing to treat up to 15.5 acres in Lake Hortonia with a single application of Renovate 3 (areas Tb and Tc) with a target concentration of triclopyr of 1.0 parts per million in the treated areas. The Applicant and Co-Applicant are also proposing to treat up to 30.6 acres in Lake Hortonia with a single application of Renovate OTF (areas Ta, Td, Te and Tf) with a target concentration of triclopyr of 2.0 to 2.5 parts per million in the bottom four feet of the water column in the treated areas. The areas proposed for treatment are shown on Attachment C.

Four of the six proposed treatment areas are areas where the Co-Applicant determined in the 2007 late-season (follow-up) watermilfoil survey that watermilfoil cover was common (>5% to 25%), too dense for handpulling and too extensive for benthic barriers to reasonably be used to control the re-growth. Following discussions with a contractor regarding the potential to control the Eurasian watermilfoil re-growth in other areas of the lake using suction harvesting, the Applicant and Co-Applicant proposed two additional areas totaling 6.0 acres for Renovate OTF treatment, areas where it would be difficult to use suction harvesting or other non-chemical methods to control the watermilfoil.

The Applicant and Co-Applicant have proposed five additional contingency treatment areas totally 29.9 acres for potential Renovate OTF treatment in 2008. The Applicant has also applied for an Aquatic Nuisance Control Permit to use a diver-operated suction harvester to control the watermilfoil in the contingency areas. If possible, the watermilfoil in the contingency areas will be managed non-chemically.

The Applicant and Co-Applicant would like the Renovate treatment to take place as early in the year as possible. The most recent literature and manufacturer information indicate that treatment should take place in spring or early summer when Eurasian watermilfoil is actively growing. The Department recognizes that the July 31, 2007 Renovate OTF treatment in Lake Hortonia took place during the active growth phase for watermilfoil. A similar Renovate OTF treatment was conducted in Lake Morey in Fairlee, Vermont, on June 24, 2007. It was reported by ACT, Inc. in their Lake Morey post-treatment report (dated December 11, 2007) that while watermilfoil was actively growing in Lake Morey at the time of the treatment and generally observed at 1 to 3 feet below the water surface at three of the four treated areas, watermilfoil in one treatment area was observed as having dense mats with flowering spikes at the water's surface, topped-out in up to ten feet of water. The Renovate OTF treatment in that area was generally considered unsuccessful at controlling the watermilfoil. To reduce the potential for this to happen in Lake Hortonia in 2008, the Co-Applicant proposes an earlier treatment in the 2008 growing season, when the target plants are actively growing but less than 4 feet tall. The treatment is proposed for mid-May.

The Renovate treatment will be performed by Vermont-licensed aquatic applicators. A subsurface application of concentrated Renovate 3 is proposed using weighted hoses mounted toward the bow of an airboat. The Renovate OTF flake will be sprayed over the surface of the water in a stream of

water using a calibrated eductor system. This application method should help limit dust and the potential for off-target drift. A granular blower system will be the backup application method in the event that there is a problem with the eductor injection system.

The boundaries of the areas to be treated with Renovate will be marked with temporary buoys and a GPS system will be used to track the path of the airboat to ensure an even distribution of Renovate throughout the designated treatment areas at the prescribed doses. The Applicant and Co-Applicant expect the treatment to be completed in one day unless there is a need to apply the Renovate 3 and Renovate OTF on separate days.

There are no municipal wells or water services provided by the towns of Sudbury or Hubbardton. All homes are supplied by either private wells or direct water intakes. There are domestic and irrigation uses of Lake Hortonia. For the purposes of reviewing this project, the Department made the very conservative assumption that shoreland residents drink the lake water. There are two Fish and Wildlife boat access areas on Lake Hortonia as well as a summer camp for boys and campground(s).

The Applicant and Co-Applicant propose that at a minimum, the temporary water use restrictions specified on the current label will be followed. The Applicant recognizes that additional restrictions may be applied in the conditions of a permit, restrictions that could extend to the use of the outlet stream. The Applicant and Co-Applicant are prepared to carry out these restrictions as required.

3. No Reasonable Non-chemical Alternative

At the time that Eurasian watermilfoil was discovered in Lake Hortonia in 1984, mechanical harvesting for excessive native plant growth was already in progress. Harvesting for watermilfoil was conducted annually from 1984 through 1992. Approximately \$83,500 in state and local funds was spent on these efforts in the nine years that harvesting was conducted. Benthic barriers have been used in the lake since 1987. The Department installed approximately 34,000 square feet of three different materials while it was conducting trials to compare the effectiveness of various brands of barrier during 1987 and 1988. Several homeowners have also received permits for small-scale benthic barrier installation. A drawdown was conducted on the lake in 1989; however impact to watermilfoil was minimal because the lake could not be lowered by more than about two feet, which left most of the watermilfoil infestation unexposed. Handpulling has been routinely conducted by lakeshore property owners. Weevils (*Eubrychiopsis lecontei*), a potential bio-control agent for Eurasian watermilfoil, have been present in the lake since at least 1994 and have shown no sign of being able to keep watermilfoil growth in check.

Following the Sonar A.S. treatment of Lake Hortonia in 2000, SCUBA divers and local residents handpulled watermilfoil in 2001 and 2002 with poor results. Handpulling was discontinued in 2003 when it was determined that the watermilfoil population had exceeded a level that could practically be controlled by handpulling. A second whole-lake treatment of Lake Hortonia using a higher concentration of Sonar A.S. was conducted in 2004. The volunteer and contracted diver handpulling that took place following the 2004 Sonar A.S. treatment successfully controlled re-growth in all but four locations in Lake Hortonia, which were subsequently spot-treated with Renovate 3 in July 2006 under the authorization of ANC Permit #2005-C02. By the end of 2006, there were additional locations where watermilfoil re-growth had outpaced the ability of the Lake Hortonia Property Owners Association to control it using non-chemical control methods. Four locations in Lake Hortonia were subsequently spot-treated with Renovate OTF in July 2007 under the authorization of ANC Permit #2007-C04. The 2007 late-season aquatic plant survey conducted by Darrin Fresh Water Institute revealed that the frequency of occurrence of watermilfoil in Lake Hortonia increased from presence in 1.4% of the samples collected in 2006 to presence in 22.6% of

the samples collected in 2007. In six areas totaling 46.1 acres, the Applicant and Co-Applicant indicated that the re-growth was too dense and/or extensive to be reasonably controlled by non-chemical control methods. In an additional five areas totaling 29.9 acres, the Co-Applicant believed that watermilfoil re-growth in early 2008 could prove to be too dense and/or extensive to be reasonably controlled by non-chemical control methods as well. Authorization was requested to treat these areas contingent upon an early-season (2008) survey to verify the need to treat.

A. Potential Alternatives

Before an Aquatic Nuisance Control Permit can be issued authorizing the use of a chemical pesticide under 10 V.S.A. § 1263a, the Applicant must demonstrate and the Secretary must find that there are no reasonable non-chemical alternatives available. Based on the Department's own work on Lake Hortonia and the other lakes around the state where non-chemical methods have been used, and based on the information submitted by the Applicant and Co-Applicant, the Department does not know of a reasonable non-chemical alternative available for use in Lake Hortonia in the areas designated for Renovate 3 and Renovate OTF treatment that would be effective at reducing watermilfoil re-growth in these areas to a level that would not jeopardize the success of lakewide control efforts begun by the 2004 whole-lake treatment and continuing with the non-chemical control methods and spot/partial lake treatments employed following that treatment. All known non-chemical alternatives have significant drawbacks that prevent them from being acceptable as the primary control method(s), either alone or in combination, to significantly reduce watermilfoil re-growth in the areas proposed for Renovate 3 and Renovate OTF treatment.

- Installation of benthic barrier and associated barrier maintenance for an area the size of that proposed for chemical treatment (46.1 acres) would be extremely labor intensive and expensive. In addition, benthic barriers are not selective for watermilfoil. There is significant native plant growth in the areas proposed for treatment. All plant species beneath the barriers would be killed in the 46.1 acres covered by benthic barrier, and the barriers would have significant adverse effects on benthic organisms as well. The use of benthic barrier on this scale would cause significant destruction of aquatic habitat, pose an unacceptable risk to non-target organisms, and be physically unmanageable, making the use of this method infeasible.
- Diver-operated suction harvesting is primarily designed for small infestations because it is slow and labor intensive due to manual removal of the plants by SCUBA divers. Careful collection of fragments is absolutely essential, otherwise watermilfoil spread can be accelerated. Use of multiple suction harvesters at one time in an attempt to control widespread areas of watermilfoil infestation, such as the areas designated for treatment, would pose an unacceptable risk to non-target organisms because of increased turbidity. In addition, Eurasian watermilfoil growth in the areas proposed for treatment generally ranges from >1% to 25% cover. Even at 1% cover, there could be 6,000 watermilfoil stems per acre. The Applicant is proposing to use suction harvesting in many other areas of the lake with 1% to 5% watermilfoil cover, and along some open shorelines with denser watermilfoil cover where chemical treatment may not be effective. The density and extent of watermilfoil growth in Lake Hortonia far exceeds the capacity for divers to successfully manage it lakewide through suction harvesting. To attempt to control the watermilfoil using suction harvesting in the denser areas proposed for treatment would redirect resources away from managing Eurasian watermilfoil in the less dense areas of the lake. This action would lead to an increase in the density of watermilfoil elsewhere in the lake as well as ineffective control in the areas proposed for chemical treatment.

- Handpulling was conducted in Lake Hortonia following the 2004 lakewide Sonar treatment. However, handpulling efforts were not sufficient to control all of the watermilfoil re-growth due to the size of the waterbody and the extent of watermilfoil re-growth. Handpulling is slower and more labor intensive than suction harvesting. The watermilfoil re-growth in the areas designated for Renovate treatment is too extensive and too dense to be effectively controlled by handpulling.
- Mechanical harvesting was used for watermilfoil control on Lake Hortonia from 1984 -1992 in an effort to provide immediate relief from dense watermilfoil growth. However, this method did not provide a satisfactory level of control. Eurasian watermilfoil growth is currently limited in Lake Hortonia. Using mechanical harvesting or other mechanical methods to control the re-growth in the areas proposed for Renovate 3 and Renovate OTF treatment would fragment the watermilfoil, increasing its potential to spread into less-infested areas of Lake Hortonia. These methods would exacerbate the problem, not manage it. Hydroraking and rotavating on the scale necessary to control watermilfoil in 46.1 acres would also have significant impacts to non-target organisms, including native plants and macroinvertebrates.
- Drawdowns of Lake Hortonia are not an option because the outlet structure does not allow for lowering water levels by much more than two feet, which would not expose a significant amount of watermilfoil. Even if a significant lowering of the lake could be achieved the potential for negative impacts to area wetlands makes this non-chemical method inappropriate. Drawdowns are not selective for watermilfoil and they can have severe negative impacts on many types of native plants that are important for fish and wildlife habitat, as well as having negative impacts on other aquatic biota.
- Weevils (*Eubrychiopsis lecontei*) have not yet proven to be effective in open-water field settings where the insects have been intentionally introduced. No conclusive data is available at this time that documents that weevils can be used as a predictable and reliable watermilfoil control method. Although weevils have occurred naturally in Lake Hortonia since at least 1994, they have not been successful at controlling the watermilfoil in this lake to-date. Allowing the Eurasian watermilfoil to continue to grow in the areas proposed for treatment in hopes that weevils will eventually control the growth would enable the Eurasian watermilfoil to auto-fragment and spread to other areas, accelerating the re-infestation of the lake.

Based on the above information, the Department finds that the Applicant has met the statutory requirement to demonstrate that “there is no reasonable non-chemical alternative available.”

4. Acceptable Risk to the Non-target Environment

Renovate 3 and Renovate OTF both have triclopyr as their active ingredient. Triclopyr is a selective broadleaf herbicide that can be used to control a variety of nuisance and invasive aquatic plant species in ponds, lakes, reservoirs, marshes, wetlands and non-irrigation ditches or canals. Triclopyr rapidly enters through a plant’s leaves and stems, then translocates down into the roots, disrupting the plant’s metabolism. Triclopyr’s auxin-type herbicidal activity generally controls woody and broadleaf (dicot) species while most monocot species are tolerant.

Potential impacts to non-target organisms from the use of Renovate may be through direct toxic effects, or indirectly, through a physical change in habitat or shift in water quality conditions caused by the chemical that may affect some other component of the lake ecosystem.

A. Potential Direct Effects of Renovate

The aquatic plant community in Lake Hortonia is still quite diverse in spite of years of dense Eurasian watermilfoil growth, a whole-lake treatment with the herbicide Sonar A.S. in 2004 and spot/partial-lake treatments of eight areas with the Renovate 3 during 2006/2007. According to the September 2006 report prepared by the Darrin Fresh Water Institute on the annual post-treatment aquatic plant survey conducted in September, the aquatic plant community of Lake Hortonia included twenty-four submersed species, three floating-leaved species, two floating species and eight emergent species. Two submersed non-native species were observed in Lake Hortonia, Eurasian watermilfoil (*Myriophyllum spicatum*) and curly-leaf pondweed (*Potamogeton crispus*). Eurasian watermilfoil was the eighteenth most widely distributed plant, found in 1.4% of the survey points. *Chara* sp. was the most widely distributed aquatic plant species in 2006, reported in 63% of the survey points. Other common native species found in at least 5% of the survey points included *Potamogeton illinoensis* (found in 25% of the survey points), *Potamogeton robbinsii* (23%), *Vallisneria americana* (22%), *Najas flexilis* (12%), *Utricularia gibba* (8%), *Utricularia vulgaris* (7%), *Stuckenia pectinata* (6%) and *Nymphaea odorata* (5%).

The 2007 report on the annual post-treatment aquatic plant survey prepared by the Darrin Fresh Water Institute reported the same species as found in 2006. The most widely distributed plants were similar to 2006, with *Chara* sp. again being the most widely distributed aquatic plant species in 2007, reported in 56% of the survey points. Other common native species found in at least 5% of the survey points included *Potamogeton illinoensis* (found in 33% of the survey points), *Potamogeton robbinsii* (22%), *Vallisneria americana* (32%), *Najas flexilis* (23%), *Utricularia gibba* (12%), *Stuckenia pectinata* (10%), *Zosterella dubia* (12%), *Elodea canadensis* (11%) and *Potamogeton zosteriformis* (8%). The last three species on this list were not found in 5% of the survey points in 2006, but in 2007 their distribution had increased significantly, being near to or exceeding their distribution in the lake prior to the first Sonar A.S. treatment in 2000. Eurasian watermilfoil increased to the fifth most widely distributed aquatic plant in 2007, present in 22.6% of the survey points, significantly more widespread than in 2006, when it was present in 1.4% of the survey points.

In 2007, 82% of lake survey points throughout the lake were vegetated by at least one native plant species; 96% of survey points with depths less than 4 meters and 100% of survey points less than 2 meters depth yielded native aquatic plants. A decline in whole-lake native plant species richness occurred in Lake Hortonia following the first whole-lake Sonar A.S. treatment in 2000 and species richness remained lowered following the second whole-lake Sonar A.S. treatment in 2004. However, by 2006, native plant species richness had increased to 1.88 native plant species per survey point, similar to the species richness observed in 1999 (1.83 native plant species per survey point) prior to the first pesticide treatment. In 2007, native plant species richness continued to increase in Lake Hortonia, to 2.44 native species per survey point.

Due to the extent of the areas proposed for the 2008 treatment the Department reviewed aquatic plant species lakewide regarding potential susceptibility and non-target impacts based on the susceptibility information provided for the 2007 Renovate treatment as well as the results of the September 2007 post-treatment plant survey conducted in Lake Hortonia. The report author used the same 126 data points and methodology for the September 2007 aquatic plant survey as were used in the September 2006 plant survey. Twenty non-target plant species were identified in the lake in the September 2006 survey. The report provides a comparison of the September 2006 and the September 2007 frequency of occurrence data for the twenty non-target species and Eurasian watermilfoil lakewide.

The following sixteen aquatic plant species were found as frequently or more frequently in 2007 than in 2006, as determined by the number of occurrences in the 126 data points in 2006 and 2007: *Elodea*

canadensis (occurrence increased from 1.4% to 10.5% of data points); *Myriophyllum sibiricum* (0% to 2.3%); *Najas flexilis* (12.2% to 23.3%); *Nuphar advena* (0.7% to 0.8%); *Potamogeton crispus* (2.2% to 3.8%); *Potamogeton gramineus* (0% to 1.5%); *Potamogeton illinoensis* (25.2% to 33.1%); *Potamogeton natans* (0.7% to 1.5%); *Potamogeton praelongus* (0% to 2.3%); *Potamogeton pusillus* (2.9% to 3.0%); *Potamogeton zosteriformis* (2.9% to 8.3%); *Stuckenia (Potamogeton) pectinata* (5.8% to 9.8%); *Utricularia gibba* (7.9% to 12.0%); *Utricularia minor* (0% to 1.5%); *Vallisneria americana* (21.6% to 32.3%); and *Zosterella (Heteranthera) dubia* (2.9% to 12.0%). Two of these increased in frequency of occurrence by more than 10%.

Eurasian watermilfoil, *Myriophyllum spicatum*, experienced a lakewide increase from 1.4% to 22.6%.

Eight aquatic plant species were found slightly less frequently in 2007 than in 2006, including: *Ceratophyllum demersum* (occurrence decreased from 2.9% to 0% of data points); *Chara* sp. (62.5% to 55.6%); *Megalodonta (Bidens) beckii* (1.4% to 0%); *Nymphaea odorata* (5.0% to 3.8%); *Potamogeton robbinsii* (23.0% to 21.8%); *Ranunculus longirostris* (0.7% to 0%); *Sphagnum* sp. (0.7% to 0%); and *Utricularia vulgaris* (7.2% to 3.0%). All of these declined by less than 10%.

Some of the variations noted above in the percent frequency of species can likely be attributed to sampling variability, low frequency of occurrence in 2006, and/or seasonal variability.

Information regarding susceptibility to triclopyr for the more common species in Lake Hortonia based on information in the literature and the results of post-treatment surveys in Renovate-treated areas of Lake Morey is as follows: *Chara* sp., the most widely distributed species, is tolerant to triclopyr. *Potamogeton illinoensis*, *Vallisneria americana*, *Najas flexilis*, and *Potamogeton robbinsii* were the next most common species found in Lake Hortonia in 2007. *Potamogeton illinoensis* and *Potamogeton robbinsii* are tolerant of triclopyr and both increased in frequency of occurrence in areas of Lake Morey following treatment with Renovate OTF in 2007. *Vallisneria americana* is intermediate to tolerant of triclopyr and also increased in frequency of occurrence in areas of Lake Morey treated with Renovate OTF in 2007. *Najas flexilis* is intermediate to tolerant of triclopyr and was unchanged in frequency of occurrence in areas of Lake Morey treated with Renovate OTF in 2007.

Zosterella dubia, *Utricularia gibba*, *Elodea canadensis*, *Stuckenia pectinata*, and *Potamogeton zosteriformis* were all found in Lake Hortonia in 2007 with an 8-12% frequency of occurrence. *Zosterella dubia* was expected to be intermediate to susceptible to triclopyr, however this species increased in frequency of occurrence in areas of Lake Morey treated with Renovate OTF in 2007. *Utricularia gibba* is tolerant of triclopyr and increased significantly in abundance in Vermont lakes treated with Renovate in 2006. *Elodea canadensis* has been reported to be intermediate in susceptibility to triclopyr. However, based on Renovate treatments conducted in Vermont in 2006 and 2007, *Elodea canadensis* is susceptible to triclopyr and its frequency of occurrence can be expected to decrease in the treated areas of Lake Hortonia following treatment. *Stuckenia pectinata* is tolerant of triclopyr. Based on Renovate treatments conducted in Vermont in 2006 and 2007, *Potamogeton zosteriformis* is susceptible to triclopyr and its frequency of occurrence can be expected to decrease in the treated areas of Lake Hortonia following treatment.

Specific information was required in post-Renovate treatment aquatic plant surveys of Lake Hortonia regarding the abundance of the non-target species in the lake that may be susceptible to triclopyr, including *Brasenia schreberi*, *Ceratophyllum demersum*, *Elodea canadensis*, *Elodea nuttallii*, *Megalodonta beckii*, *Myriophyllum sibiricum*, *Nuphar variegata*, *Nymphaea odorata*, *Polygonum* sp., *Pontederia cordata*, *Potamogeton amplifolius*, *Potamogeton epiphydrus*, *Potamogeton gramineus*, *Potamogeton zosteriformis*, *Ranunculus longirostris*, *Sparganium natans*, *Utricularia geminiscapa*, *Utricularia gibba*, *Utricularia minor*, *Utricularia vulgaris* and *Zosterella dubia*. The results of the plant surveys are as follows:

Elodea nuttallii, *Sparganium natans*, and *Utricularia geminiscapa* have not been observed in Lake Hortonia since the 1980s and were not found in 2006 or 2007. *Brasenia schreberi*, *Potamogeton amplifolius*, and *Nuphar variegata* were also not found in 2006 or 2007. As noted above, the percent frequencies of *Ceratophyllum demersum*, *Megalodonta beckii*, and *Ranunculus longirostris* were low in 2006 (2.9%, 1.4% and 0.7%) and these species were not found in 2007.

Nymphaea odorata experienced a slight decrease from 2006 to 2007 (5.0% to 3.8%) as did *Utricularia vulgaris* (7.2% to 3.0%).

The frequency of occurrence of *Nuphar advena* remained virtually unchanged between 2006 and 2007. *Polygonum* sp. and *Pontederia cordata* were observed in the lake in both 2006 and 2007, although not in any of the 126 survey points.

Potamogeton epiphydrus was not found in the open-water area of Lake Hortonia in 2006, but was observed in 2007, although not in any of the 126 survey points. *Myriophyllum sibiricum*, *Potamogeton gramineus*, and *Utricularia minor* were all absent in 2006 and present in 2007 (at 2.3%, 1.5%, and 1.5%, respectively). *Elodea canadensis* increased significantly between 2006 and 2007, from 1.4% to 10.5%. No increases were noted in areas treated with Renovate in 2007, but several of the areas where *Elodea canadensis* increased had been treated with Renovate in 2006. The percent frequency of occurrence of *Potamogeton zosteriformis* increased from 2.9% in 2006 to 8.3% in 2007, and *Utricularia gibba* increased from 7.9% in 2006 to 12.0% in 2007. *Zosterella dubia* experienced a significant increase from 2.9% in 2006 to 12.0% in 2007.

In 2007, Department staff designed and conducted a study to qualitatively assess non-target plant impacts from triclopyr treatments in two other Vermont lakes (Lake Morey and Lake St. Catherine). The study design compared plant composition, pre- and post-treatment, at both treated and untreated sites (plots). Plots in each lake were sampled once prior to treatment and at approximately one-month intervals following treatment for three months in Lake Morey and two months in Lake St. Catherine. Snorkeler observations of aquatic plant species occurrence (presence/absence) at each site were recorded during each sampling event. Photographs were taken at each plot to visually assess plant structure and physical presence during the course of the summer months. The study authors assigned a numerical value to the coverage of plant density (target and non-target) found in each photo as follows: heavy - 3, moderate - 2, light - 1 and no vegetation - 0. Numeric plant density estimates from the photos taken at each plot were averaged to represent the density for each plot per visit.

The results of the study indicated that in Lake Morey, plant species richness in the two untreated plots remained the same or dropped during the three post-treatment visits. The two untreated plots went from a June high of 9 species each, to September counts of 9 and 8, respectively. Plant species richness at one untreated plot was more consistent over time than the other. Species richness over the summer at treated plots was also inconsistent, with some plots showing 50% or more of the species present during all visits, while other plots experienced far fewer reoccurring species. No consistent trend was observed in species richness over time nor was there any clear loss of species noted after treatment. In fact, it was documented that more species were identified during each visit after treatment than before treatment at three of the four treated plots.

In Lake St. Catherine, species richness from snorkeler observations at the untreated plots between July and September varied between the two plots with one increasing slightly and the other clearly decreasing. Species richness at the two treated plots increased. Of a total of 13 species identified at the treated plots, only two, *Megalodonta beckii* and *Sagittaria* sp., were found before treatment and not after treatment. The pre-treatment record (July) for *M. beckii* however, was represented by only a

single plant. *M. beckii* may have been present in subsequent visits (August and September) but went unnoticed. Alternately, 36% of the plant species were identified only after the treatment, boosting the total treated-plot richness during the August and September visits. Richness generally increased after the treatment for both treated plots and one of the two untreated plots. The 2007 triclopyr treatment appeared to have no negative impact on species occurrence or richness.

Photographic assessments of relative plant density at the two untreated plots in Lake Morey failed to show any consistent seasonal trend in plant density. As a result, no expectations for trend could be established for the treated plots. Comparison was made however, of post-treatment densities between treated and untreated plots. The mean August-September density value for the untreated plots was 1.5 (range 1.0-2.0). The mean August-September value for the four treated plots was 1.9 (range 0.9-2.8). At treated plots, Eurasian watermilfoil dominated pre-treatment photo frames and was absent or dramatically reduced during later visits. There was no significant loss of native species richness or relative density at any of the treated sites following treatment. Bottom cover as assessed by the top-down photo showed luxurious, dense and often diverse growth during all assessment periods. The appearance of taller-growing plants varied after treatment but was always judged from light to heavy-to-moderate in the treated plots. Even when observed growth was light within the photo frame, lower-growing plants still thickly covered the bottom, out of view of the directional photographs but documented in the top-down photos.

In Lake St. Catherine, photographic assessments at both treated and untreated plots consistently showed substantial plant growth during all site visits. Top-down photographs showed complete cover in both treated and untreated plots throughout all site visits. One treatment plot showed a decline from moderate to light-to-moderate plant density following the treatment, reflecting the reduction in Eurasian watermilfoil due to the effects of triclopyr. The relative plant density at the other treatment plot remained moderate throughout the summer. Both treatment plots and one control plot supported at least a moderate-to-light plant density during the two post-treatment visits. The only observable reduction in plant density following treatment in Lake St. Catherine was at the one treatment plot where Eurasian watermilfoil was nearly eliminated by the treatment. Total plant density following the treatment was judged to be less, but it was comprised almost entirely of native species, many of which grew tall enough to be visible in photographs, contributing to the moderate growth observed in half of the photos. Overall, there was no observable reduction in native aquatic plant species growth post-treatment at either of the two triclopyr-treated plots in Lake St. Catherine.

The snorkelers observed effective control of Eurasian watermilfoil at treated sites in both lakes with the exception of one Renovate OTF site in Lake Morey (west shore) where watermilfoil was poorly controlled by the treatment. End of season aquatic plant survey reports for both lakes submitted by the Co-Applicant indicated that Eurasian watermilfoil responded favorably to the treatment in most areas with significant reductions of watermilfoil density and distribution observed.

The snorkelers observed the seasonal dynamic nature of aquatic plant occurrence and species richness at fixed locations in both Lake Morey and Lake St. Catherine. Many aquatic plant species would be identified one month and not the next at both untreated and treated plots. This changing species assemblage during the growing season could confound before- and after-treatment species richness counts. The dynamic nature of these plant communities must be taken into account when evaluating lake herbicide treatments, not only within a single growing season but on an annual scale as well. The snorkelers reported that their in-the-water impressions of the plots and the surrounding areas after the triclopyr treatment in both lakes were an appearance of healthy, normal aquatic plant growth with no indications of any reduction in native plant structure.

No comments were received from wildlife biologists with the Vermont Department of Fish and Wildlife regarding the proposed 2008 Renovate 3 and Renovate OTF treatment of Lake Hortonia.

No comments were received from wetlands ecologists with the Department's Wetlands Office regarding the proposed treatment.

Renovate is not directly toxic to aquatic organisms such as fish, waterfowl, and invertebrates when used at the rates recommended on the product label - no greater than 2.5 parts per million in lakes. These levels have been found to be safe to the environment and non-target animal species based upon testing conducted for US EPA registration purposes. There was a low order of toxicity for the fish species tested. The Department does not anticipate direct toxicity to amphibians or reptiles.

A fisheries biologist with the Vermont Department of Fish and Wildlife and a botanist with the Department of Fish and Wildlife Nongame and Natural Heritage (NNHP) Program reviewed the application and requested that any treatment be timed early in May, preferably during the week of May 5 or May 12, or earlier if the Eurasian watermilfoil is actively growing. The fisheries biologist indicated that he has concerns regarding potential direct toxicity of Renovate OTF from direct contact and ingestion of the flake by fish. Once the lake water temperature reaches 60°F in the spring, several of the fish species in Lake Hortonia (such as largemouth bass, smallmouth bass and bluegill) will be in the process of constructing and actively guarding nests containing incubating eggs. The use of a solid formulation (Renovate OTF) will result in the deposition of chemical in these nests and in direct contact with eggs. The potential for direct ingestion of the chemical can occur as the result of guarding behaviors of adult males, as well as during egg predation by other species. To minimize the potential for Renovate OTF to impact spawning fish and incubating eggs, the treatment should take place either before the water reaches 60°F or after June 22.

The factors required for an effective treatment along with the greatest possible protection for non-target species (both fish and aquatic plants) need to be considered when determining the most appropriate timing for a Renovate treatment in Lake Hortonia. It is desirable to conduct the treatment as early as possible to reduce impacts to non-target plants, as many native plants will not be actively growing early in the season. However, the Eurasian watermilfoil must be actively growing for the treatment to be effective. Eurasian watermilfoil begins to grow very early in the year in Vermont, and it should be actively growing shortly after the ice goes off the lake. By the time the water reaches 60°F, watermilfoil will be actively growing.

If the treatment cannot occur prior to the water temperature reaching 60°F, and is thus scheduled to occur after June 22, the potential exists for the watermilfoil to have reached a growth stage that is too mature to be effectively controlled by the treatment. The Department therefore intends to require the Co-Permittee to conduct a pre-treatment survey to determine the growth stage of the watermilfoil in the areas to be treated if the treatment is scheduled for after June 22. If the watermilfoil is fully grown or to the water surface in an area or areas designated for treatment, no treatment will be allowed to occur in those areas.

The Applicant and Co-Applicant proposed to treat with Renovate OTF to a target triclopyr concentration of 2.0 to 2.50 parts per million (ppm) in the bottom four feet of the water column, which is higher than the target concentration of 1.75 ppm used in 2007. The reason given for the higher treatment rate, which was provided by the Co-Applicant at the time that the Co-Applicant made a similar request for Lake Morey, is to overcome the effects of dilution and provide a more effective treatment. However, the fisheries biologist, the NNHP botanist and the Department are concerned that a higher rate could have negative impacts on the non-target aquatic plants known to be susceptible to triclopyr, and on species, particularly rare species, whose susceptibility is unknown. No information was submitted by the Applicant or Co-Applicant to indicate that dilution resulted in an ineffective treatment in 2007. Renovate OTF (On-Target Flakes) is specifically designed for use in areas where dilution could be a problem. In order to minimize pesticide use and potential impacts

on non-target aquatic plants, the Department intends to restrict the target triclopyr treatment concentration in the bottom four feet of the water column in Lake Hortonia to 1.75 ppm, the same treatment concentration that was used in 2007.

The Applicant and Co-Applicant proposed to treat with Renovate 3 to a target triclopyr concentration of 1.0 ppm in Areas Tb and Tc as shown in Attachment C. The liquid formulation and a lower target concentration can be used in these areas because they are contiguous areas that are relatively contained, where dilution will not be a factor. The lower concentration should minimize potential negative impacts on water lilies in these areas.

Renovate may have a direct toxic effect on some terrestrial crop plants. The current label for Renovate has an irrigation precaution that states: "Water treated with Renovate [3/OTF] may not be used for irrigation purposes for 120 days after application or until triclopyr residue levels are determined by laboratory analysis, or other appropriate means of analysis, to be 1.0 ppb or less." If these precautions are followed it is unlikely that there will be toxic effects on terrestrial plants.

A representative from SePRO Corporation, the manufacturer of Renovate OTF, provided a copy of an amended product label indicating that the amended label includes the following language regarding irrigation with treated waters: "There is no restriction on use of treated water to irrigate established grasses." The representative indicated that amended labels are sent to the states on a quarterly basis and thus it would not be until the first week of April 2008 that the label update would be mailed to Vermont. An evaluation by the Agency of Agriculture, Food and Markets would follow. Therefore, at this time the Department will continue to use the existing label language, which does not include the above reference to established grasses.

Dense watermilfoil beds, particularly those that cover a high percentage of a lake's surface area or littoral zone, have the potential to cause many changes in the lake environment, which can both directly and indirectly impact aquatic organisms. Some of these impacts include reduced oxygen levels; a significant increase in water temperature; changes in lake nutrient dynamics and sediment loading; displacement of native and/or endangered, threatened or rare aquatic plant species; changes in fish spawning site availability; changes in horizontal and vertical fish distribution; and reduction in feeding success of predatory fish.

The displacement of native aquatic plants in particular has been seen in Vermont lakes where Eurasian watermilfoil has become widespread and dense. While the 2007 Renovate OTF treatment provided watermilfoil reduction/control in all four treated areas in Lake Hortonia, watermilfoil is re-infesting numerous other areas of the lake. The use of Renovate as proposed by the Applicant and Co-Applicant in year five of the integrated management plan that began with the 2004 whole-lake treatment of Lake Hortonia with Sonar A.S. will extend the length of time that watermilfoil growth can be controlled in additional areas of the lake through non-chemical means and provide available habitat for the native aquatic plants in the lake. Uncontrolled, the Eurasian watermilfoil will once again out-compete the native plants. The Department therefore finds that the direct impacts of the proposed Renovate treatment, as described above, pose an acceptable risk to the non-target environment.

B. Potential Indirect Effects of Renovate

Indirect impacts to non-target organisms such as fish, waterfowl, and macroinvertebrates can occur from the use of an aquatic herbicide if the product used is not selective for the target plant or if the target plant growth is so extensive that it comprises a significant portion of the habitat in the lake. Extensive vegetation removal results in loss of substrate, cover, and food for these organisms. This situation is not expected to occur in Lake Hortonia because Renovate is relatively selective at low

concentrations. In 2007, 82% of the 126 lake survey points were vegetated by at least one native plant species, and most of these species are tolerant of triclopyr. It is anticipated that numerous native plant species will increase in abundance in Lake Hortonia following the Renovate treatment due to less competition from Eurasian watermilfoil. Based on past experience in Vermont, *Elodea canadensis* (found in 10.5% of the survey points in 2007) and *Potamogeton zosteriformis* (found in 8.3% of the survey points in 2007) are susceptible to triclopyr and their frequency of occurrence can be expected to decrease in the treated areas of Lake Hortonia following treatment. However, the proposed treatment will not result in a drastic aquatic vegetation shift in a large percentage of the lake's littoral zone. As noted above, Department staff observations of study plots and the surrounding areas after the 2007 triclopyr treatments in Lake Morey and Lake St. Catherine were an appearance of healthy, normal aquatic plant growth with no indications of any reduction in native plant structure.

When fast-acting herbicides are used in lakes, there is potential for aquatic organisms to be impacted indirectly due to temporarily depressed oxygen levels caused by rapidly decomposing aquatic plants. In 2007, the loss of watermilfoil in the treated areas was gradual and did not result in immediate and significant dying off after the Renovate treatment. In addition, if the treatment occurs when water temperatures are still relatively cool, the potential for oxygen to be depleted to a critical level will be reduced. No critical oxygen depletions are anticipated following the proposed treatment.

Another potential impact of herbicide treatments can be the release of the nutrient phosphorus from decomposing vegetation. While it was thought to be possible that an algae bloom caused by increased phosphorus levels could occur as a result of a Renovate treatment, no algal bloom was noted following either the 2006 or 2007 treatment. No algae blooms due to phosphorus release from decomposing vegetation are anticipated to result from the proposed treatment.

In Vermont, it has been demonstrated that chemical control methods that reduce watermilfoil growth result in an increase in native plant populations over time if a successful long-range management plan is implemented to address watermilfoil re-growth. In Lake Hortonia, it has been demonstrated that the sole use of non-chemical control methods can no longer manage the Eurasian watermilfoil population. The Department believes that the components of the Applicant's ANC Permit #2002-C04 long-range management plan as updated during annual meetings with the Department, including spot/partial-lake treatment with Renovate 3 and Renovate OTF, will extend the length of time that diver handpulling, suction harvesting and benthic barrier installation conducted by organized volunteers on Lake Hortonia with contracted assistance will be able to manage the watermilfoil.

Having reviewed all of the potential negative impacts of the proposed treatment on the non-target environment of Lake Hortonia, and the potential negative impacts of not treating the Eurasian watermilfoil population in the areas proposed for treatment, the Department finds that the proposed spot/partial-lake treatment with Renovate 3 and Renovate OTF in specified areas of watermilfoil re-growth in Lake Hortonia poses an acceptable risk to the non-target environment if it is conducted at a target concentration of 1.75 parts per million and in accordance with the product label, the submitted proposal as modified/conditioned by this permit, and the conditions of this permit.

5. Negligible Risk to Public Health

The Vermont Department of Health (DOH) reviewed the proposed project to use Renovate 3 and Renovate OTF in a spot/partial-lake treatment of Lake Hortonia. The DOH examined the potential level of concern for public health that may be associated with exposure to water that has been treated with either product and made the following comments, among others:

The federal product labels for both Renovate 3 and Renovate OTF establish minimum setback distances for application to water bodies that contain functioning potable water intakes. The labels also specify that if either product is to be used around or within the appropriate setback distance "...the [potable water] intake must be turned off until the triclopyr level in the intake water is determined to be 0.4 parts per million (ppm) or less by laboratory analysis or immunoassay."

However, due to the influence of many site-specific factors, neither label indicates what the maximum concentration of active ingredient is expected to be in the waters of concern at any location at any point in time after application. In addition, the exact extent of product use that will occur is not clear as the permit application lists both Lake Hortonia and Burr Pond as the waterbody in question and requests permission to just treat "up to 76 acres in Lake Hortonia."

Spot treatment of select areas with Renovate OTF occurred as recently as 2007.

Therefore, if either Renovate 3 or Renovate OTF is to be used as proposed, DOH recommends that certain water use restrictions beyond the federal label requirements should be instituted in order to ensure protection of public health.

The following recommended water use conditions are based upon review of the most current scientific information available for triclopyr including any potential health effects, the half-life of the compound, an evaluation of the time for complete dissolution of the OTF flake formulation conducted by the DEC Aquatic Nuisance Control Program, consideration of who is likely to come into contact with treated waters and in what manner, several very health protective assumptions and standard risk assessment procedures, knowledge of previous chemical control efforts and the assumption that **only one product** will be applied per growing season.

In the event that a **combination** of the liquid and flake products will be used during the same growing season, it is recommended that the **more conservative recommendations** listed for Renovate OTF be followed overall.

Please note, based on a review by the State Toxicologist for the Department of Health, it is reasonable to conclude that human exposure to the inert compounds contained in the products proposed for use at the concentrations that would result under the following conditions, is not likely to result in an increase in the level of concern for public health.

SPECIFIC RECOMMENDATIONS

Prior to any treatment with Renovate 3 or Renovate OTF, representative samples of the water body(ies) to be treated and corresponding outlet stream(s) (within one-quarter mile of the effluent) should be chemically tested to determine if triclopyr is present at less than or equal to 75 parts per billion (ppb). Analysis of multiple samples is necessary in order to account for the influence of many chemical, media and site specific factors. Triclopyr residues must be confirmed to be less than or equal to 75 ppb before application of Renovate 3 or Renovate OTF may occur.

Once it is determined that treatment with Renovate 3 or Renovate OTF may move forward, the following recommendations apply.

Because it is not possible to predict the nature and extent of product use and distribution, the following whole water body use conditions are recommended as default.

RENOVATE 3 (liquid formulation)

No use of the treated water body and its associated outlet stream(s) (for one mile downstream of the effluent) for any purpose (including recreational uses such as boating and fishing) is recommended on the day of application. Boating, fishing and toilet flushing may resume at the beginning of the day following application. Swimming and domestic use other than drinking and using such waters to prepare food or drink, may resume 24 hours after application. Drinking and using such waters to prepare food or drink should not resume until the conditions that follow have been met.

Twenty-four hours after the initial application of Renovate 3, representative samples of the treated water body and its outlet stream(s) (within one-quarter mile of the effluent) should be chemically tested to determine if triclopyr is present at less than or equal to 75 ppb. Analysis of multiple samples is necessary in order to account for the influence of many chemical, media and site specific factors.

If triclopyr is confirmed to be at or below 75 ppb, full use of the treated water body, its waters and outlet stream(s), including all domestic uses may resume. However, if triclopyr is detected in representative samples from these waters above 75 ppb, an additional 24 hour waiting period should occur during which time the treated water body and its outlet stream(s) (within one mile downstream of the effluent) should again not be used for drinking water or in the preparation of food or drink. At the end of this second 24 hour waiting period, representative samples of the treated water body and its outlet stream(s) (within one-quarter mile downstream of the effluent) should again be taken and chemically analyzed for triclopyr. This process should be repeated until representative sampling indicates that the level of triclopyr in the treated water body and outlet stream(s) is at or below 75 ppb.

Only once residues of triclopyr are confirmed to be below 75 ppb should full use of the treated water body and/or its outlet stream(s) resume. Until full use can be resumed, bottled water should be supplied by the applicant to those who may depend upon the treated water body and/or its outlet stream(s) (within one mile of the effluent) for their domestic drinking water or food and drink preparation water supply.

Public notification of property owners and residents of the treated water body areas as well as commercial camps and parents whose children are attending camps which use the water body of concern and/or waters within one contiguous watermile of this water body will occur 30 days prior to application. Water body access areas as well as any nearby campgrounds should be posted.

RENOVATE OTF (flake formulation)

No use of the treated water body and its associated outlet stream(s) (for one mile downstream of the effluent) for any purpose (including recreational uses such as boating, fishing and swimming and all domestic uses including toilet flushing) is recommended on the day of application and the entire day after.

Recreational uses such as boating, fishing and swimming may resume at the beginning of the second day following application.

Domestic use other than drinking and using such waters to prepare food or drink, may resume

at the beginning of the second day following application.

Drinking and using such waters to prepare food or drink should not resume until the conditions that follow have been met.

Forty-eight hours after the initial application of Renovate OTF, representative samples of the treated water body and its outlet stream(s) (within one-quarter mile of the effluent) should be chemically tested to determine if triclopyr is present at less than or equal to 75 ppb. Analysis of multiple samples is necessary in order to account for the influence of many chemical, media and site specific factors.

If triclopyr is confirmed to be at or below 75 ppb, full use of the treated water body, its waters and outlet stream(s), including all domestic uses may resume. However, if triclopyr is detected in representative samples from these waters above 75 ppb, an additional 24 hour waiting period should occur during which time the treated water body and its outlet stream(s) (within one mile downstream of the effluent) should again not be used for drinking water or in the preparation of food or drink. At the end of this second 24 hour waiting period, representative samples of the treated water body and its outlet stream(s) (within one-quarter mile downstream of the effluent) should again be taken and chemically analyzed for triclopyr. This process should be repeated until representative sampling indicates that the level of triclopyr in the treated water body and outlet stream(s) is at or below 75 ppb.

Only once residues of triclopyr are confirmed to be below 75 ppb should full use of the treated water body and/or its outlet stream(s) resume. Until full use can be resumed, bottled water should be supplied by the Applicant to those who may depend upon the treated water body and/or its outlet stream(s) (within one mile of the effluent) for their domestic drinking water or food and drink preparation water supply.

Public notification of property owners and residents of the treated water body areas as well as commercial camps and parents whose children are attending camps which use the water body of concern and/or waters within one contiguous watermile of this water body will occur 30 days prior to application. Water body access areas as well as any nearby campgrounds should be posted.

Numerous water samples were collected and analyzed for triclopyr following the 2007 Renovate treatment of four areas in Lake Hortonia. The Department has determined that the results of these analyses are sufficient to confirm that triclopyr residues are less than 75 ppb in Lake Hortonia and its outlet stream. Therefore, the Department has determined that additional water samples do not need to be analyzed for triclopyr before the proposed Renovate treatment may occur.

The entire lake and the outlet stream downstream to where the stream flows under VT Rte. 144 will be included in the restricted-use area. This encompasses a distance of more than 1.5 miles downstream of the lake, exceeding the required potable water intake setback distances listed in the Renovate labels for the Lake Hortonia treatment scenario.

The Department has determined that 15 days public notification, rather than 30 days public notification, of property owners and residents adjacent to the treated and restricted waterbody areas as well as commercial camps and parents whose children are attending camps that use the waterbodies, will provide adequate notice to protect public health.

Based on the above information, the Department finds that the proposed project will pose a negligible risk to public health if permit conditions are followed.

6. Long-range Management Plan

Vermont law (10 V.S.A. §1263a) requires that a long-range management plan be developed that incorporates a schedule of pesticide minimization before a permit may be issued to use pesticides in Lake Hortonia. The long-range integrated management plan (IMP) proposed by the Applicant and approved by the Department in association with ANC Permit #2002-C04 (authorizing a whole-lake treatment using Sonar A.S.), as updated annually, will apply to the proposed 2008 Renovate treatment. The IMP combines the use of chemical and non-chemical methods over five years to manage the infestation of Eurasian watermilfoil in Lake Hortonia (and Burr Pond). The goal of the five-year IMP has been to reduce the Eurasian watermilfoil population during the first year through whole-lake chemical treatment and use non-chemical methods and spot/partial-lake chemical treatment, if needed, in subsequent years. The original IMP included the use of two primary non-chemical control strategies for scattered or small patches of Eurasian watermilfoil re-growth, benthic barriers and handpulling. In addition, spot/partial-lake chemical treatment was proposed for years four and/or five in the event that the initial Sonar A.S. treatment and the non-chemical control methods employed in subsequent years did not effectively control the watermilfoil.

The Applicant conducts educational and volunteer training efforts in each year of the IMP to increase awareness of the control program, recruit volunteers to assist with the IMP, and reduce the potential for the lake to be infested with a new invasive species. The Applicant provides regular updates on the IMP in the newsletter published by the Lake Hortonia Property Owners Association.

The Lake Hortonia Property Owners Association and Burr Pond Association received an Aquatic Nuisance Control Permit in July 2005 (ANC Permit #2005-B04) to use up to 8,400 square feet of benthic barrier material in the two waterbodies combined. Although the associations purchased *Aquascreen* benthic barrier material in 2005, no concentrated patches of dense watermilfoil growth have been found to-date that would benefit from benthic barrier installation. The Applicant, working with the Lake Hortonia Property Owners Association, is prepared to use benthic barrier material if its use is warranted.

The Applicant recently submitted an Aquatic Nuisance Control (ANC) permit application for the use of a powered mechanical device (suction harvester) in Lake Hortonia and Burr Pond. The Applicant intends to add the use of this non-chemical control method to the IMP in an effort to control watermilfoil in 2008 and into the future, if approved.

At this time, entering year five of the five-year plan, the IMP is on track. A whole-lake treatment of Lake Hortonia using Sonar A.S. was conducted during the summer of 2004. The Darrin Fresh Water Institute conducted complete post-treatment aquatic plant surveys of Lake Hortonia in August/September of 2004, 2005, 2006 and 2007. In addition, watermilfoil reconnaissance surveys were conducted by the Co-Applicant in 2005, 2006 and 2007. Based on the results of the 2005 plant survey, the Applicant applied for and received an ANC permit to use Renovate 3 in four areas in Lake Hortonia totaling 23 acres where watermilfoil re-growth could not feasibly be controlled by handpulling or benthic barriers. That treatment was conducted on July 11, 2006. Based on the results of the 2006 plant survey, the Applicant applied for and received an ANC permit to conduct a Renovate OTF treatment in four additional areas totaling 12.5 acres in Lake Hortonia. That treatment was conducted on July 31, 2007. In addition, non-chemical control methods have been conducted each year as specified in the IMP including handpulling using paid divers and volunteer handpullers around the lake. The 2007 plant survey results revealed new areas and some repeat areas where watermilfoil growth has outpaced the non-chemical control methods implemented to-date. The Applicant and Co-Applicant submitted an ANC permit application for the use of Renovate in these areas in 2008. The Applicant intends to use handpulling and suction harvesting in

2008 as well. Non-chemical control methods will be used in the proposed “contingency” treatment areas if feasible, and in other areas where watermilfoil re-growth is found in 2008.

The Applicant, in conjunction with the Lake Hortonia Property Owners Association (and the Burr Pond Association), has revised the preliminary budget for year five of the IMP to include the Renovate treatment and non-chemical control methods to be employed in year five. The original budget for implementation of the five-year plan was estimated to be \$189,915 plus the cost of any spot/partial-lake treatments. The non-chemical portion of the project was expected to cost approximately \$103,000. Annual costs for the non-chemical portion of the plan were estimated to be \$3,000 in year one; \$22,000 in year two; \$16,000 in year three; \$31,000 in year four; and \$31,000 in year five. The original budget did not include cost estimates for spot/partial-lake treatments proposed if needed for years four and/or five. Year one of the IMP actually cost more than \$96,000. Year two actually cost over \$50,000, with cash expenditures of \$27,000 and more than \$23,000 contributed through in-kind services. The total cost for the year three Renovate 3 treatment and non-chemical control activities was \$102,513. The total cost for the year four Renovate OTF treatment and non-chemical control activities was \$73,487. The total cost for the year five Renovate treatment and non-chemical control activities is estimated to be \$137,073.

By employing all of the components of the IMP in an integrated fashion during the five-year IMP and updating and revising it as appropriate and approved, the Applicant is seeking to control Eurasian watermilfoil in Lake Hortonia (and Burr Pond) in order to restore recreational uses as well as enhance the native aquatic plant community and ensure habitat diversity. While the Applicant is currently working under a five-year plan that ends in 2008, the Applicant recognizes that eradication is not attainable and management of Eurasian watermilfoil will be an annual undertaking that needs to continue well beyond that time. A diligent and sustained effort in the years covered by the IMP and beyond will be required to prevent Lake Hortonia (and Burr Pond) from becoming re-infested to the point where recreational uses and the ecology of the lakes are threatened.

As 2008 is the fifth (and final) year of the IMP, annual meetings to update the IMP will no longer be required. However, the Department intends to require an annual meeting with the Applicant after each required post-treatment aquatic plant survey has been conducted, submitted to the Department and reviewed, to discuss the level of watermilfoil control achieved/maintained, the impacts to non-target species, and other pertinent issues as well as the most effective strategy to accomplish continued integrated management of Eurasian watermilfoil in Lake Hortonia.

The Department finds that the Applicant has incorporated a schedule of pesticide minimization over the long term by proposing a spot/partial-lake treatment in year five of the IMP in areas where non-chemical control methods have proven to be ineffective at controlling watermilfoil in the lake. The spot/partial-lake treatment will enable non-chemical control methods to be focused elsewhere in Lake Hortonia, where they can be more effective at controlling watermilfoil re-growth, and will reduce the potential for watermilfoil to spread into other areas of the lake. The Department finds that the IMP has a reasonable chance of achieving its goal provided that the Renovate treatment is conducted in accordance with the conditions of this permit and the components of the updated IMP are adhered to.

The Department would consider the IMP to be successful if at the end of the five-year IMP, Eurasian watermilfoil in Lake Hortonia remains manageable by efforts other than a whole-lake chemical treatment, and a strong framework exists for continuing the management efforts indefinitely.

7. Public Benefit

The Department has determined that the use of the aquatic herbicide Renovate to selectively treat up to 76 acres of Lake Hortonia as part of an updated integrated management plan that combines chemical and non-chemical control technologies to manage Eurasian watermilfoil in Lake Hortonia will provide a public benefit. The proposed spot/partial-lake treatment will extend the length of time that non-chemical control methods including diver handpulling, benthic barrier installation and suction harvesting (if a permit is received by the Applicant), combined with a strong local organization overseeing control efforts, will be able to manage the Eurasian watermilfoil re-growth that is occurring following the 2004 whole-lake treatment with Sonar A.S. This extended time of Eurasian watermilfoil control will enhance the native aquatic plant community in the lake by allowing native plant species to continue the spread they began following the removal of the dense Eurasian watermilfoil growth in 2004 and enable native plants to successfully compete against watermilfoil, thus promoting habitat diversity. The proposed project will continue the significant improvement to the recreational use of the lake for multiple uses that occurred after the removal of the Eurasian watermilfoil. Continued control of Eurasian watermilfoil re-growth in Lake Hortonia will also help prevent Eurasian watermilfoil fragments from being easily transported from this lake to other bodies of water on boat motors and trailers.

The Department intends to require that treatment occur on Monday through Thursday to avoid the need to close Lake Hortonia to recreational use on a weekend. Weekends are typically when the highest recreational use occurs and fishing tournaments are typically scheduled for weekends. If the Applicant and Co-Applicant can arrange for an early May treatment, the Department, in consultation with the Department of Fish and Wildlife, may consider allowing treatment to occur on a Friday, Saturday and/or Sunday.

8. Appeal of this Decision

Pursuant to 10 V.S.A. Chapter 220, any appeal of this decision must be filed with the Clerk of the Environmental Court within 30 days of the date of the decision. The appellant must attach to the Notice of Appeal the entry fee of \$225.00, payable to the State of Vermont.

The Notice of Appeal must specify the parties taking the appeal and the statutory provision under which each party claims party status; must designate the act or decision appealed from; must name the Environmental Court; and must be signed by the appellant or their attorney. In addition, the appeal must give the address or location and description of the property, project or facility with which the appeal is concerned and the name of the Applicant or any permit involved in the appeal.

The appellant must also serve a copy of the Notice of Appeal in accordance with Rule 5(b)(4)(B) of the Vermont Rules for Environmental Court Proceedings.

For further information, see the Vermont Rules for Environmental Court Proceedings, available on line at www.vermontjudiciary.org. The address for the Environmental Court is 2418 Airport Road, Suite 1, Barre, VT 05641-8701 (Tel. 802-828-1660).

Dated at Waterbury, Vermont this ____ day of _____ 2008

By _____
Justin G. Johnson, Deputy Commissioner
Department of Environmental Conservation

Attachment A
Herbicide Application Record Form

1. Name and location (town) of lake(s) treated _____
2. Date of treatment _____
3. Time of treatment _____
4. Product trade name and formulation of herbicide used _____
5. Product manufacturer _____
6. Objective(s) of herbicide treatment _____
7. Total amount of herbicide used (gallons, quarts, etc.) along with chemical treatment quantity calculations _____
8. Date thermocline measured and the thermocline depth (m) along with water column temperature profile measurements used for herbicide amount calculation _____

9. Number of acres treated _____
10. Target concentration of herbicide in water column (ppb) along with target concentration calculations _____
11. Herbicide application technique _____

12. Equipment used _____
13. Amount of time required to complete herbicide application _____
14. Weather and lake conditions at the time of treatment (rain, wind, wave action) _____
15. Describe procedures taken to dispose of surplus product, empty containers, and rinseate.

16. Problems encountered _____

17. Name of Company (Co-Permittee) conducting treatment _____
18. Name(s) of all company personnel on-site during treatment _____

19. Comments: _____

Signed:

Permittee _____

Co-Permittee _____

Dated _____

Dated _____

Attachment B

**State of Vermont
Department of Environmental Conservation
Request for Co-Permittee Status**

I hereby request authorization, on behalf of myself as an individual or for

_____ (Company), to become a Co-Permittee to use Renovate 3 and Renovate OTF as approved by issuance of Aquatic Nuisance Control (ANC) Permit #2008-C01 to control Eurasian watermilfoil in Lake Hortonia in Sudbury and Hubbardton, Vermont. I hereby certify that I have read and am familiar with the terms and conditions of the aforementioned permit and agree to comply with all permit conditions that pertain to the Co-Permittee and/or work conducted by the Co-Permittee.

Name of Permittee: _____

Signature and Title of Permittee's Authorized Representative:

Date: _____

Name of Proposed Co-Permittee's Representative:

Company Name: _____

Address: _____

Business Phone/FAX: (____)_____/ (____)_____

Signature and Title of Proposed Co-Permittee's Representative:

Date: _____

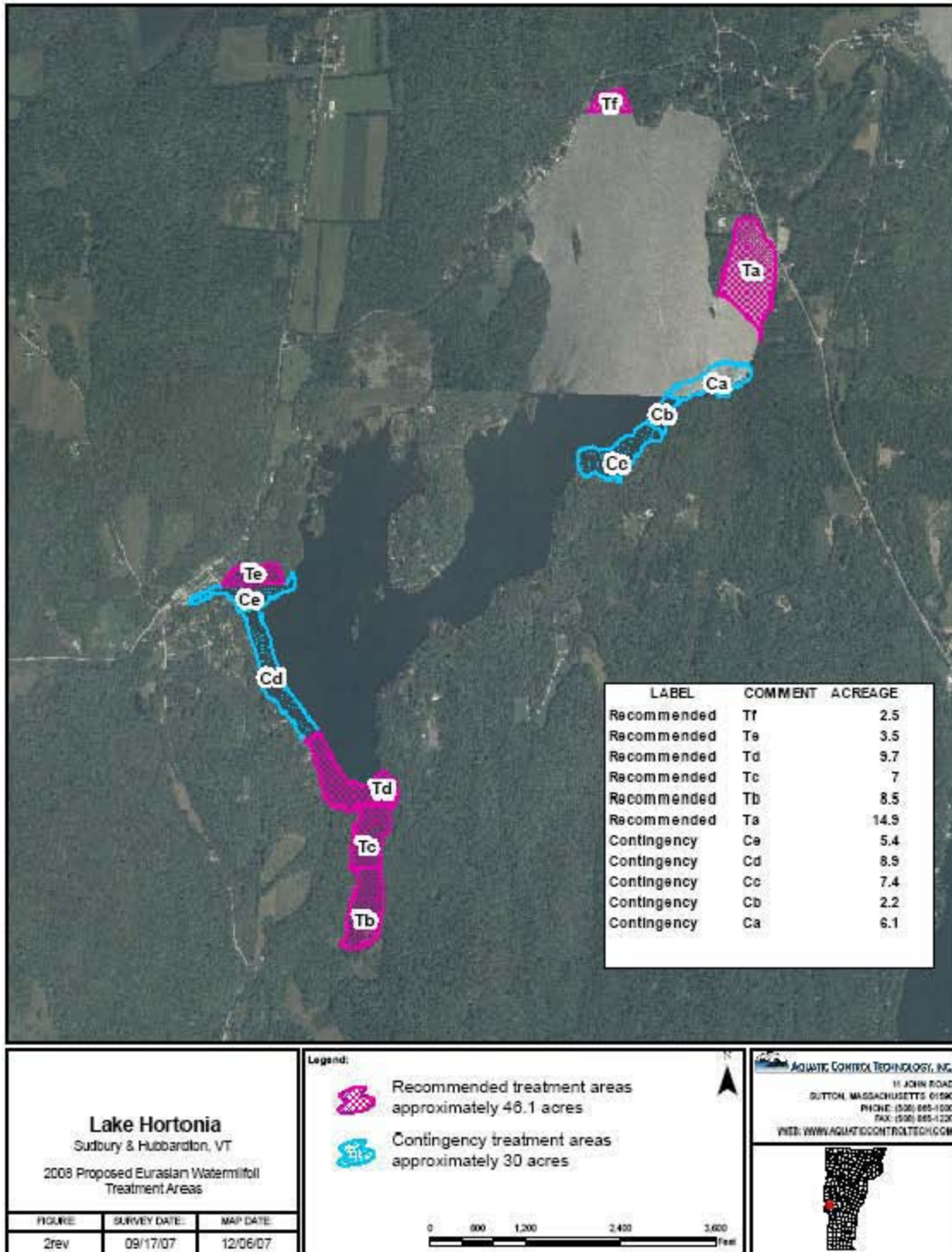
Submit request to: VT Department of Environmental Conservation
Water Quality Division
103 South Main Street, Building 10 North
Waterbury, VT 05671-0408

Attachment C

Areas Approved for Renovate OTF Treatment: Ta, Td, Te and Tf

Areas Approved for Renovate 3 Treatment: Tb and Tc

Contingency Areas Approved for Renovate OTF Treatment only upon completion of Permit Condition 4: Ca, Cb, Cc, Cd and Ce



Water Use Restrictions Apply to Entire Lake and downstream from the dam to Route 144

Attachment D Sampling Site Locations



O denotes 14 Sample Sites (including outlet stream at Rte. 144 crossing)