

2. In one of the years 2009 or 2010, the Permittee and Co-Permittee are authorized to conduct one spot/partial-lake treatment of up to 52 acres total in Lake Morey, as approved by the Department, as soon as the watermilfoil is actively growing, with the aquatic herbicide, Renovate OTF, active ingredient triclopyr, EPA Registration No. 67690-42, to achieve a target triclopyr concentration (concentration) between 1.85 – 2.25 parts per million (ppm) in the bottom four feet of water depth. The Permittee and Co-Permittee shall provide documentation to the Department if a concentration of greater than 1.85 ppm is needed for effective triclopyr uptake by the amount of watermilfoil present for each area proposed. The documentation shall include at a minimum: a qualitative assessment of the density (percent cover) of watermilfoil present, an estimate of the amount (length and branching) of active or new growth of stems and foliage and an estimate of the amount of watermilfoil growth vertically in the water column. Once the Permittee and Co-Permittee have documented the need for a concentration greater than 1.85 ppm, the Permittee and Co-Permittee may proceed with a treatment in accordance with the conditions of this permit. The Permittee and Co-Permittee shall provide the documentation to the Department with (and as part of) the Herbicide Treatment Record Form (Attachment A) required by Condition 8, below within seven calendar days following the date of the Renovate OTF treatment. The areas approved by the Department are described in Attachment B.
3. If the watermilfoil is flowering in an area or areas designated for Renovate OTF treatment at the time of treatment, no treatment shall occur in those areas.
4. The treatment shall only occur on a Monday, Tuesday, Wednesday or Thursday to avoid the need to close Lake Morey to recreational use over a weekend.
5. The specific product(s) used, 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.
6. The disposal of surplus Renovate OTF, container rinseate, and empty product containers shall be conducted according to product label requirements and federal and state law and regulations.
7. Renovate OTF 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.
8. The Permittee and Co-Permittee shall submit to the Department an Herbicide Treatment Record Form (Attachment A) along with chemical treatment quantity calculations associated with the treatment within seven calendar days following the date of the Renovate OTF treatment.
9. Prior to treatment taking place, the Permittee and Co-Permittee shall submit to the Department the name(s), current address, and telephone number of all owners of property along the outlet stream downstream to the US Route 5 crossing of the outlet stream.
10. Prior to any treatment occurring in Lake Morey with 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 Morey 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 Morey: 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 Morey as a means of preventing the introduction of non-native species into or out of Lake Morey. 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 Morey 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 Morey 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.

11. The Permittee shall remove all benthic barrier material from the areas treated with Renovate by September 30th in the year of Renovate OTF treatment. Documentation describing the amount and location of removed benthic barrier shall be submitted to the Department by December 31st of the same year.
12. 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 Morey to conduct official business as soon as the Renovate OTF application has been completed. The Department may grant written authority for Agency staff to boat on Lake Morey during the treatment in the event that special circumstance(s) warrants the activity. If granted the Department in consultation with the Co-Permittee will coordinate the activity prior to any boating while treatment is taking place.
13. 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 Rich.Kirn@state.vt.us and Bob.Popp@state.vt.us. Alternatively, the Permittee may call Susan Brittin (802-241-3786), Rich Kirn (802-485-7566) and Bob Popp (802-476-0127) to notify them at least five days prior to the treatment taking place.
14. The Permittee shall meet with the Department on an annual basis 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 be implemented as the next phase of the five-year integrated management plan. The Permittee shall implement each phase of the integrated management plan as mutually agreed upon by the Department and the Permittee at the annual meeting and shall not change the management plan without prior written approval from the Department. The Permittee's obligations under this condition shall continue until the five-year integrated management plan is completed.
15. The Permittee shall maintain all data and records relating to the activities authorized by this permit and the associated five-year integrated management plan for a period of one year

following the completion of the integrated management plan. 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.

16. There shall be **no use** of Lake Morey and the outlet stream downstream to US Route 5 as shown in Attachment B for any purpose beginning the day of the Renovate OTF 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.
17. There shall be **no irrigation use** of the water from Lake Morey and the outlet stream downstream to US Route 5, including use for watering lawns, trees, shrubs or plants, beginning the day of the Renovate OTF 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 22 and 23 below, that indicate that the concentration of triclopyr is equal to or less than 1.0 part per billion by laboratory analysis].
18. **Recreational uses such as swimming/wading, boating and fishing** may resume at the beginning of the **second** day following the Renovate OTF treatment.
19. **Domestic uses other than** drinking and using waters to prepare food or drink may resume at the beginning of the **second** day following treatment.
20. There shall be **no use of the water** from Lake Morey and the outlet stream downstream to US Route 5 **for drinking or to prepare food or drink** beginning the day of the Renovate OTF 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 22 and 23 below, that indicate that the concentration of triclopyr is at or below 75 parts per billion by laboratory analysis].
21. 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.
22. The Permittee and Co-Permittee shall collect water from at least eight sites in Lake Morey and one site in the outlet stream as shown in Attachment B for the analysis of triclopyr. Samples shall be collected within the bottom four feet of water at each sample site using sampling equipment designed to collect samples at a discrete depth, beginning approximately 24 hours after completion of the Renovate OTF treatment and continuing at least monthly 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 Morey reveals detectable amounts of triclopyr.

23. Water samples collected in accordance with Condition 22 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 24, below. Individuals collecting water samples for analysis shall be trained directly by SePRO Corporation or the Co-Permittee.
24. 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.
25. 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 either hand-delivered, sent via electronic mail, sent with a stamped (Permittee contact addressed) return postcard or sent Certified Mail-Return Receipt, to all property owners of land that abuts Lake Morey as shown in Attachment B at least 15 days prior to the treatment taking place.

A list of all **property owners who received** hand delivered notices, sent notices with return postcard, notices sent via electronic or certified mail, and a list of those property owners who signed for the hand delivered notices, returned postcards, responded via electronic mail and certified mail receipt, 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** postcards, respond via electronic mail or certified mail receipt 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 respond to the notice 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 Morey and the outlet stream downstream to US Route 5 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 Morey or the outlet stream downstream to US Route 5 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 Morey or the outlet stream downstream to US

Route 5 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 25c below. The notice shall inform property owners in bold print that if a residence or cottage will be rented at any time during or 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 25a above shall be provided at least 15 days prior to the Renovate OTF treatment to any commercial camps abutting Lake Morey or the outlet stream downstream to US Route 5 as shown in Attachment B, 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 an angle that provides the greatest amount of eye contact for passing vehicles, at least once every 1,000 feet along the lakeward side of the roadways in the vicinity of the shoreline of Lake Morey;
 - (2) at all public and private campgrounds, hotels, inns, beaches and access points where the public might enter or use these waterbodies; and
 - (3) at the Fairlee town office.

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 vehicle traffic, 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

The areas shown on the map have water use restrictions due to a treatment with the aquatic herbicide Renovate on _____ (date).

IN THE AREAS SHOWN ON THE MAP THERE SHALL BE:

NO USE of the water in the areas shown 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 48 hours prior to the Renovate OTF 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 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.
26. 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 OTF was at or above the treatment target concentration (collectively termed "Renovate-treated areas"), in the year of Renovate OTF 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.

27. The Permittee shall conduct three post-treatment quantitative aquatic plant surveys of the Renovate-treated areas and the untreated areas using the same survey methods and during approximately the same time period each year (August to early-September) as the pre-treatment plant survey conducted by Aquatic Control Technology, Inc. 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) specific information on impacts on non-target aquatic plants in the Renovate-treated areas; and (e) a map depicting specific areas surveyed, with associated text describing species present and their abundance (include abundance key) for each area.
28. The Permittee and Co-Permittee shall conduct the Renovate OTF treatment and implement the integrated management plan in strict accordance with the permit application dated January 2, 2009 (Permittee) and December 30, 2008 (Co-Permittee), received on January 6, 2009; the following Findings; and the conditions of this permit, with such minor modifications as may be approved in writing by the Department.
29. 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 by submitting the required documentation (see Attachment C) to the Department, and by receiving written authorization from the Department to become the Co-Permittee before performing any and all activities required of the Co-Permittee under this permit.
30. 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.
31. 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.
32. 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.
33. 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.
34. 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.
35. 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.
36. 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 Permittee and Co-Permittee and others relative to the proposed project to use Renovate OTF in Lake Morey to control Eurasian watermilfoil and makes the following Findings as required under 10 V.S.A. § 1263a(e).

1. Jurisdiction

Lake Morey is located in Fairlee, Vermont. The waterbody 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. 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 Morey in Fairlee, Vermont is a 547-acre waterbody with a maximum depth of 43 feet and an average depth of approximately 24 feet. Several named and intermittent inlet streams feed the lake. The outlet is located at the southernmost point of the lake. Outlet waters flow south for approximately two miles through a series of small impoundments before emptying into the Connecticut River.

Eurasian watermilfoil (*Myriophyllum spicatum*) is an aggressive, non-native aquatic plant that was first identified in Lake Morey in 1991 in three separate locations: Breezy Bay, the north end of the Lake, and along the middle of the east shore. In 1993, the Applicant applied for and was issued a permit to use Garlon 3A, active ingredient triclopyr, on approximately 5 acres of dense watermilfoil. The permit was appealed before the Vermont Water Resources Board. The Water Resources Board reversed the Agency of Natural Resources' permit decision and declared the permit null and void. No treatment occurred.

The Applicant, in conjunction with the Lake Morey Protective Association (LMPA), the Lake Morey Commission, the Department and many individuals, worked in an integrated fashion from 1991 through 2005 using non-chemical methods in an attempt to control and prevent lakewide spread of watermilfoil. Non-chemical control activities included: use of benthic barrier material, augmentation of the indigenous watermilfoil weevil population (2005 only), use of diver-operated suction harvesting, pulling of individual watermilfoil plants by hand, use of boating restrictions in one area due to dense watermilfoil (closed by the Department at the request of the Applicant; now reopened), and numerous education and outreach initiatives. The use of benthic barrier material, diver-operated suction harvesting, handpulling, and education and outreach is ongoing. These efforts have been conducted using private and municipal funds and funds received from the Department's Aquatic Nuisance Control Grant-in-Aid Program.

Beginning in 2004, the watermilfoil infestation rapidly expanded from a few dense patches and many scattered plants around the lake to approximately 45 acres of watermilfoil beds as reported in the 2006 late-season watermilfoil survey. Complaints regarding watermilfoil's interference with swimming, boating and fishing also increased.

Due to the sudden expansion of watermilfoil in the lake, the Applicant and the LMPA contracted with the Co-Applicant in 2006 to conduct an aquatic vegetation survey and prepare a Long-Term Aquatic Vegetation Management Plan for Lake Morey. The abundance and distribution of watermilfoil in the lake as observed during the August 2006 survey was described as too extensive to be managed effectively with the non-chemical control methods employed up to that time (handpulling, suction harvesting and benthic barrier installation). The Applicant proposed that the non-chemical methods remain part of an integrated management program for Lake Morey following spot/partial-lake treatments in years one, two and three of the five year integrated management plan

(IMP) with the herbicide Renovate. Utilizing non-chemical strategies to control low-density regrowth following herbicide treatments will continue to stress the watermilfoil population and reduce the frequency and scope of future herbicide applications.

On May 15, 2007, the Applicant was issued ANC Permit #2006-C25 authorizing a spot/partial-lake treatment using Renovate 3 in one 30-acre area of abundant watermilfoil growth and Renovate OTF in three areas totaling 15 acres. The Co-Applicant indicated that the benefit of the dry flake in Renovate OTF is that it carries the triclopyr to target plants in deeper water and localizes it where the plants are growing, effectively holding it "on target." Therefore, the flake formulation was used in three areas with higher potential for dilution.

On April 2, 2008, the Applicant was issued ANC Permit 2007-C13 authorizing spot/partial-lake treatment using Renovate OTF to treat a maximum of 50 acres along the east, west and southern shorelines of the lake in 2008 in ten treatment blocks, targeting what was identified during the Co-Applicant's August 2007 aquatic plant survey as all of the remaining watermilfoil beds. The 50-acre area treated in 2008 represented approximately 46% of the lake's littoral area.

As noted by the Co-Applicant in the 2008 aquatic plant survey, the 2008 Renovate OTF treatment did reduce watermilfoil density and distribution, but was less effective than anticipated. The reduced level of response seen in 2008 is believed to be the result of exposure to a sub-lethal dose of triclopyr and/or insufficient active watermilfoil growth to insure adequate triclopyr uptake.

The Renovate treatment in 2007 represented the first phase of a five-year program to chemically treat all of the dense watermilfoil growth in Lake Morey with spot/partial-lake treatments using Renovate OTF. The Applicant and Co-Applicant are proposing to treat the 52 acres along the east, west and southern shorelines of the lake in 2009, targeting the remaining watermilfoil beds in Lake Morey, either those areas that have not been treated previously or those treated in 2008 that responded poorly due to the above mentioned conditions. The areas treated in 2007 include: 1) 38 acres at the north end (Renovate 3), 2) nine acres on the west shore, 3) four acres on the west shore (south of the nine acres treated) and, 4) a nine acre area and a three acre area on the east shore. The areas treated in 2008 include: 1) an area beginning just south of the nine acres on the west shore treated in 2007 extending around the entire littoral area with the exception of the north end and eight small areas scattered within that littoral area that did not warrant treatment. In 2009, proposed areas include a continuous band from the fishing access area on the western shore along the littoral area of the lake with the exception of the north end.

The Applicant and Co-Applicant propose the use of Renovate OTF between late May and mid June, later than the May 13, 2008 treatment. Also, the Applicant and Co-Applicant request a higher application rate of 2.50 ppm. The Renovate OTF application rate used in 2008 was 1.85 ppm.

There is municipal water provided by the town of Fairlee to a portion of the town's residents. Some of the homes/businesses on Lake Morey are supplied by either private wells or direct water intakes. There are domestic and irrigation uses of Lake Morey. For the purposes of reviewing this project, the Department made the very conservative assumption that shoreland residents drink the lake water. There is a Town Beach on the southern end of the lake, a Vermont Department of Fish and Wildlife access area located on the west side of the lake, and two summer camps on the northwest shore of the lake. The Lake Morey Country Club draws water from the outlet stream at the south end of the lake and uses it to irrigate a golf course.

The Applicant and Co-Applicant proposed that at a minimum, the temporary water use restrictions specified on the current label be followed. They recognize that additional restrictions may be

applied in the conditions of a permit, restrictions that could extend to the use of the outlet stream in addition to the use of the lake. The Applicant and Co-Applicant are prepared to carry out these restrictions as required.

A. Aquatic Herbicide Description

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 Vermont Department of Health (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 ANC Permit #2006-C25. The DOH provided comments on the Applicant's current application (#2007-C13) 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 watermilfoil. As in 2008, the product will be evenly applied throughout the treatment areas at the prescribed treatment dose. The equipment used for delivering the product to the waterbody in 2008 will be the same equipment used in 2009. The equipment will spray the flake over the surface of the water in a stream of water using a calibrated eductor system. This system limits dust and the potential for off-target drift as was noted in the 2008 application. 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.

The active ingredient in Renovate is 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. 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 flakes in less than an hour, with the remainder of the triclopyr released within 24 - 48 hours. The product label indicates that triclopyr should be applied when watermilfoil is actively growing.

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 OTF (once the product has released from the granules - within first 24 hours) in the aquatic environment ranges from 0.5 to 7.5 days.

Triclopyr is taken up by the plants in just 1 to 2 days, with control of watermilfoil generally seen within approximately 3 to 4 weeks. Triclopyr is highly selective for 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

Based on the results of the August 2008 aquatic plant survey, the LMPA's past experience using diver hand-pulling, suction-harvesting and bottom barriers in prior years, the Co-Applicant's professional opinion, and to further improve treatment efficacy, in 2009 the Applicant and Co-Applicant are requesting 1) the use of Renovate OTF to achieve a target triclopyr concentration of 2.50 parts per million (ppm) in the bottom four feet of the water column, 2) delaying treatment until there is more active watermilfoil growth to improve herbicide uptake and, 3) treat in a contiguous band rather than skipping areas of less dense growth (except in the north end and along roughly half of the west shore).

The proposed 2009 treatment areas were identified by the Co-Applicant during the August 2008 survey and include a maximum of 52 acres located in the littoral area of the lake extending to a water depth of 20 feet. Most of the dense watermilfoil beds are located in narrow bands along steeply sloped shorelines. In many cases, the beds only extend 100 feet from shore or less. The benefit of using the flake formulation rather than the liquid formulation of Renovate is that it provides greater capacity for overcoming the effects of dilution at these areas.

While the August 2008 aquatic plant survey report showed the 2008 treatment resulted in an additional reduction (approximately 20%) of watermilfoil distribution and density in Lake Morey, it also revealed watermilfoil density was low throughout the entire littoral zone (with the exception of the north end and along roughly half of the west shore) and at a level that is too extensive and widespread to be effectively managed using only non-chemical control techniques in 2009. These results show the 2008 treatment was less effective than anticipated. The Applicant and Co-Applicant suggest that the reduced effectiveness seen in 2008 is the result of two factors: 1) exposure to a sub-lethal dose of triclopyr and, 2) insufficient active watermilfoil growth to insure adequate triclopyr uptake.

In the August 2008 report, the Co-Applicant further stated that overall the 2007 treatments provided good watermilfoil control during the year of treatment and good carryover watermilfoil control through the year after treatment. Only one of the four areas, the area along the west shore, did not respond favorably in 2007 and was attributed to the fact that the watermilfoil plants had already flowered and metabolism was reduced, limiting herbicide uptake.

Previous spot-treatments in Vermont at Lake St. Catherine and Lake Hortonia were also performed later in the season (between late June and late July) when there were more mature (but not flowering) watermilfoil plants and response was favorable during both the year-of-treatment and year-after-treatment. With earlier season treatments, it was hoped that watermilfoil would be more susceptible to triclopyr, conflicts with lake users would be reduced and impacts on non-target plants that were not in their most active phase of growth would be less.

On May 13, 2008, watermilfoil plants were actively growing in Lake Morey, but only an estimated 1-2 feet of active or new plant tissue was observed on what appeared to be stems from the previous year. Watermilfoil plants were generally within 2-4 feet of the bottom. Some additional active watermilfoil growth was seen at Lake Hortonia and Lake St. Catherine, which were treated one-week later than Lake Morey in 2008, but there was still only approximately 2-4 feet of new watermilfoil growth in the water column.

By contrast, the 2007 Renovate OTF treatments at all three waterbodies were performed when the watermilfoil plants were generally within 1-2 feet of the surface in water depths of 7-10 feet. The target application rate was the same during the 2007 and 2008 treatments on the three waterbodies (1.85 ppm at Lake Morey and 1.75 ppm at Lake Hortonia and Lake St. Catherine – all calculated based on the bottom 4 feet of the water column). The treatment areas were expanded beyond the extent of the watermilfoil beds to help overcome the effects of dilution and an even application rate was targeted throughout the treatment area.

The request to increase the Renovate OTF application rate to 2.5 ppm (calculated on the bottom 4 feet) in Lake Morey was not approved in the 2008 permit (#ANC 2007-C13) due to stated concerns over the potential for adverse impacts to non-target plants, pesticide minimization and the fact that the 2007 Renovate OTF treatment was described as successful in all areas with the exception of the west shore area where watermilfoil was observed to be at the waters surface and flowering. The Applicant and Co-Applicant suspect that the causes of reduced treatment efficacy in 2008 were that the watermilfoil was exposed to sub-lethal triclopyr concentrations and/or did not have enough active tissue growth to absorb sufficient levels of triclopyr and the efforts to overcome the effects of dilution were not fully realized.

The Applicant and Co-Applicant propose to treat a contiguous band of littoral area in the areas designated for Renovate OTF use in 2009. Previously the Co-Applicant treated a minimum of 2.5 acres around each watermilfoil bed to overcome the effects of dilution. The 2.5-acre buffer was determined by the Co-Applicant as out to the 20-foot water depth, which would also treat any scattered watermilfoil plants growing near the dense beds. The proposed treatment area of 52 acres includes treating to the 20-foot water depth along the littoral areas proposed for treatment in 2009.

The Renovate OTF treatment will be performed by Vermont-licensed aquatic applicators. The boundaries of the areas to be treated 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 OTF throughout the designated treatment areas at the prescribed dose. The Applicant and Co-Applicant expect the treatment to be completed in one day with a contingency for a second day, if needed. The Co-Applicant plans to apply a half dose of the Renovate OTF to the eastern and western narrow bands initially. Then apply the full dose to the wider band at the southern end of the lake following that up with the second half dose of Renovate OTF to the eastern and western bands in the lake. The Co-Applicant indicated that splitting the application in this manner may help to maintain a lethal concentration of the herbicide for a longer period of time in the narrow watermilfoil beds along the east and west shorelines that are more subject to dilution.

3. No Reasonable Non-chemical Alternative

Watermilfoil was first identified in Lake Morey in 1991 in three separate locations. As noted above, the Applicant, in conjunction with many other groups and individuals, has worked in an integrated fashion since that time in an attempt to control and prevent lakewide spread of watermilfoil. The non-chemical control activities used include: benthic barrier material, augmentation of the indigenous watermilfoil weevil population, use of diver-operated suction harvesting, pulling of individual watermilfoil plants by hand, use of boating restrictions in one area due to dense watermilfoil (closed by the Department at the request of the Applicant, now reopened) and numerous education and outreach initiatives.

Due to the expansion of the watermilfoil population in spite of the diligent ongoing non-chemical control measures, the Applicant initiated a long-range integrated management plan (IMP) in 2007 that included the use of an herbicide. Renovate 3 and Renovate OTF were used to control 45 acres

of dense watermilfoil beds in the 2007 growing season. The long range management plan included the use of Renovate in spot/partial-lake treatment in subsequent years. Renovate OTF was used to control 50 acres of dense watermilfoil in 2008. As part of the IMP, the Applicant is requesting the use of Renovate OTF in 2009 to control approximately 52 acres of dense watermilfoil beds identified during the August 2008 survey.

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 Morey 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 the areas designated for Renovate treatment that would be effective at reducing watermilfoil growth to a level that would not jeopardize the gains realized from the 2007 and 2008 treatments, and the ongoing long-range management plan. All known non-chemical alternatives have significant drawbacks that prevent them from being acceptable, either alone or in combination, to significantly reduce watermilfoil growth in the areas proposed for Renovate OTF treatment and promote successful long-range management of watermilfoil in Lake Morey.

- Installation of benthic barrier and associated barrier maintenance has been used for many years in Lake Morey in areas determined to be of appropriate size and density for effective control with benthic barrier. The Town of Fairlee currently has an ANC permit authorizing the use of benthic barrier material in up to 3.28 acres of Lake Morey (ANC Permit 2005-C05). To install benthic barrier material in an area the size of that proposed for chemical treatment (approximately 52 acres) would be extremely labor intensive and expensive. In addition, benthic barriers are not selective for watermilfoil. The areas proposed for chemical treatment contain numerous native plant species as well as dense watermilfoil. All plant species beneath the barriers would be killed in the 52 acres covered by benthic barrier, and the barriers would have significant adverse effects on benthic organisms. The use of benthic barrier on this scale would cause significant destruction of aquatic habitat and pose an unacceptable risk to non-target organisms, making the use of this method infeasible for large areas.
- Diver-operated suction harvesting has been used in Lake Morey for many years, beginning in 1992. It is currently authorized by ANC Permit 2002-H01. Suction harvesting is primarily designed to control small infestations because it is slow and labor intensive for SCUBA divers to manually remove the plants. The areas of watermilfoil growth proposed for treatment are too extensive to control effectively with suction harvesting. To attempt to do so, the Applicant would need to redirect existing resources away from managing watermilfoil regrowth in areas where watermilfoil was treated with Renovate last year, and away from managing other areas of scattered watermilfoil growth. This action would lead to an increase in the density of watermilfoil in those areas as well as ineffective control in the areas proposed for chemical treatment.
- Handpulling has been conducted in Lake Morey since the discovery of watermilfoil in 1991. However, it is slower and more labor intensive than suction harvesting. The watermilfoil growth in the areas designated for Renovate treatment is too extensive and too dense to be effectively controlled by handpulling.

- Mechanical harvesting poses a significant risk of spreading highly invasive species like watermilfoil that propagate through vegetative fragmentation. As a result, harvesting is not an appropriate technique to use to control an infestation of watermilfoil that has not completely infested all of the littoral area such as is found in Lake Morey. Mechanically harvesting watermilfoil in Lake Morey would exacerbate the current situation.
- Drawdowns of Lake Morey are not an option because the existing outlet structure does not enable a significant lowering of the lake. Even if a significant lowering of the lake could be achieved, drawdowns are not selective for watermilfoil and they can have severe negative impacts on many native plants that are important for fish and wildlife habitat, as well as having negative impacts on other aquatic biota.
- Weevils (*Enbrychiopsis 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. Weevils were first found occurring naturally in Lake Morey in 1993, and the population has been augmented since then. A natural decline in watermilfoil that may be attributable to weevils was observed in the north end of Lake Morey in 1996, and occasional declines have been observed since then. However, each time the watermilfoil growth quickly rebounded. Weevils have not been successful at controlling the watermilfoil in the lake to-date. Allowing the watermilfoil to continue to grow in the areas proposed for treatment in hopes that weevils will eventually control the growth would enable the watermilfoil to auto-fragment and spread to other areas of the lake, exacerbating the current situation and jeopardizing the success of the control methods being used elsewhere in 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 OTF 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. The active ingredient, 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 OTF 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 Morey is still diverse in spite of the watermilfoil infestation that has been in the lake for more than 17 years. A survey conducted in August 2006 prior to the first Renovate treatment reported 22 species including watermilfoil: 16 were submersed, 3 were floating-leaved and 3 were algae (2 macro-algae species and 1 green filamentous species). Seventeen additional species have been found at least once in various surveys conducted by the Department since 1981. The Nongame and Natural Heritage Program (NNHP) of the Vermont Department of Fish and Wildlife informed the Department that there are records of two rare plants in Lake Morey, *Najas guadalupensis* (not seen in the lake since 1968) and *Potamogeton vaseyi* (not seen in the lake since

1994). Neither of these two rare plant species known from the lake was identified during the Co-Applicant's aquatic plant surveys conducted in 2006 (a pre-treatment survey), 2007 and 2008.

There are 52 acres proposed for treatment in 2009 as a contiguous band along the lake's southeast, west and southern shoreline extending out to the 20-foot depth contour in the lake. The proposed areas do not include the areas in the northern end of the lake and portions of the west shore that were treated in 2007. It includes smaller areas where watermilfoil was observed at less than dense levels in the 2007 late season aquatic plant survey and subsequently were not treated in 2008. The Applicant indicated that treating in a contiguous band along the designated littoral areas will provide a more effective treatment in locations having dense watermilfoil abutting a small area of less than dense watermilfoil (< than 2.5 acres) within the designated treatment areas.

Due to the extent of the areas proposed for the 2009 treatment the Department reviewed aquatic plant species lakewide regarding potential susceptibility and non-target impacts based on the susceptibility information provided for the 2008 Renovate treatment as well as the results of the August 2008 post-treatment plant survey conducted in Lake Morey. The Co-Applicant used the same 116 data points for the August 2008 aquatic plant survey as were used in the prior two aquatic plant surveys. Twenty-one non-target plant species were identified in the lake in the August 2006 survey. A comparison of the August 2006, 2007 and 2008 frequency of occurrence data lakewide for the identified aquatic plant species (including watermilfoil) is provided in Table 1. For the purposes of this comparison, only changes of 10% or greater in occurrence were considered "significant" to allow for natural seasonal and year to year variability. In addition, species seen at less than 5% of the sites were not evaluated for change in occurrence.

Table 1. Frequency of occurrence data (FOC) in 2006, 2007 and 2008, and trends of occurrence for each aquatic plant species identified in Lake Morey (lakewide) during the August 2006 aquatic plant survey. Symbols in columns indicate species found significantly more frequently after treatment (+), found significantly less frequently after treatment (-), no change in occurrence before vs. after treatment (nc), or no data available (*).

Species	Pre		Post			
	2006 FOC %	2007 FOC %	2007 +/- over 2006 FOC %	2008 FOC %	2008 +/- over 2007 FOC %	2008 +/- over 2006 FOC %
<i>Myriophyllum spicatum</i>	61.2	43.1	-	33.6	-	-
<i>Ceratophyllum demersum</i>	37.9	47.4	+	43.1	nc	+
<i>Najas flexilis</i>	30.2	28.4	nc	28.4	nc	nc
<i>Potamogeton amplifolius</i>	26.7	23.3	nc	31.0	+	+
<i>Vallisneria americana</i>	26.7	21.6	-	24.1	+	nc
<i>Zosterella dubia</i>	18.1	28.4	+	25.0	-	+
<i>Potamogeton robbinsii</i>	16.4	27.6	+	32.8	+	+
<i>Potamogeton zosteriformis</i>	14.7	5.2	-	16.4	+	+
<i>Potamogeton gramineus</i>	13.8	12.1	nc	15.5	+	+
<i>Megalodonta beckii</i>	11.2	19.0	+	30.2	+	+
<i>Elodea canadensis</i>	10.3	3.4	-	0.9		-
<i>Potamogeton praelongus</i>	8.6	11.2	+	23.3	+	+
<i>Potamogeton richardsonii</i>	7.7	*		*		
<i>Potamogeton pusillus</i>	6.0	12.1	+	2.6	-	-
<i>Musci</i> sp.	5.2	2.6	-	3.4		
<i>Chara</i> sp.	3.4	3.4		0.9		
<i>Nitella</i> sp.	2.6	18.1	+	19.8	nc	+
<i>Eleocharis</i> sp.	2.6	0		0.9		
<i>Nymphaea odorata</i>	1.7	2.6		4.3		
<i>Potamogeton illinoensis</i>	0.9	8.6	+	19.8	+	+
<i>Brasenia schreberi</i>	0.9	0		0		
<i>Nymphoides cordata</i>	0.9	0		0		
<i>Utricularia purpurea</i>	0.9	0		0		
Total species	22	18		19		

Based on the frequency of occurrence data collected, 8 non-target plant species were found more frequently in 2007 than in 2006, and 7 of these same species were also found more frequently in 2008 than in 2006. An additional two species were found more frequently in 2008 than in 2006 or 2007.

Four non-target species were found less frequently in 2007 than in 2006. Three species were found less frequently in 2008 than in 2006. However, only one non-target species was found less frequently in both 2007 and 2008 from 2006 levels, *Elodea canadensis*. Watermilfoil experienced a decrease lakewide, from 61.2% in 2006 to 43.1% in 2007 and 33.6% in 2008.

Overall, more species increased in occurrence than decreased, possibly due in part to the decrease in watermilfoil opening up more areas for growth of native species.

In addition to the lakewide data presented in Table 1, the 2008 Year Two Report included post-treatment frequency of occurrence data for the non-target plant species located in the Renovate OTF-treated areas (81 of 116 sampling points). A comparison of this to 2006 frequency of occurrence data for non-target native aquatic plants species from the same 81 sampling points is provided in Table 2. For the purposes of this comparison, only changes of 10% or greater in occurrence were considered “significant” to allow for natural seasonal and year to year variability. In addition, species seen at less than 5% of the sites were not evaluated for change in occurrence.

Table 2. Frequency of occurrence pre-treatment (2006) compared to 2008 for non-target native species, based on 81 sampling points in the treated areas. Symbols indicate species found significantly more frequently after treatment (+), found significantly less frequently after treatment (-), no change in occurrence before vs. after treatment (nc) or data unavailable (*).

Species	2006 FOC %	2008 FOC %	2008 +/- over 2006 FOC %
<i>Ceratophyllum demersum</i>	30.9	44.4	+
<i>Najas flexilis</i>	28.4	22.2	-
<i>Potamogeton amplifolius</i>	24.7	34.6	+
<i>Vallisneria americana</i>	22.2	21.0	nc
<i>Zosterella dubia</i>	18.5	32.1	+
<i>Potamogeton gramineus</i>	12.4	14.8	+
<i>Elodea canadensis</i>	9.9	1.2	-
<i>Potamogeton robbinsii</i>	9.9	17.3	+
<i>Potamogeton pusillus</i>	7.4	3.7	-
<i>Musci</i> sp.	6.2	3.7	-
<i>Potamogeton zosteriformis</i>	4.9	2.5	-
<i>Chara</i> sp.	3.7	1.2	
<i>Nitella</i> sp.	3.7	23.5	+
<i>Eleocharis</i> sp.	3.7	0	
<i>Potamogeton richardsonii</i>	2.5	0	
<i>Megalodonta beckii</i>	2.5	21.0	+
<i>Potamogeton illinoensis</i>	1.2	18.5	+
<i>Nymphaea odorata</i>	1.2	1.2	
<i>Brasenia schreberi</i>	1.2	0	
<i>Utricularia purpurea</i>	1.2	0	
<i>Potamogeton praelongus</i>	*	15.3	
Total species	21	17	

In the treated areas, eight non-target species increased in frequency of occurrence between 2006 and 2008, one showed no change, and five decreased. Of these five, as with the lakewide data, *Elodea canadensis* shows the most marked decrease. The other six non-target species were seen in such overall low numbers that it is difficult to attribute the decrease to the herbicide treatments. (Note: there is incomplete information available for *Potamogeton praelongus* but it had a post-treatment frequency of occurrence of 15.3 %.)

The data above reveals that the species richness encountered lakewide during the 2008 survey is consistent with the 2006 survey findings. Lake Morey continues to support a diverse native aquatic plant population. Four species with limited distribution in 2006 were not recorded in 2007 and/or

2008, *Eleocharis* sp., *Brasenia schreberi*, *Potamogeton richardsonii*, *Utricularia purpurea*. All of these species were found at a very low frequency of occurrence in 2006. The Co-Applicant's Year Two Report (2008) noted that the lakewide frequency of occurrence of *Myriophyllum spicatum* experienced a decrease in frequency of occurrence in the treated areas from 2006 to 2008 (86.7% to 43.2%). Some of the variations noted in the species frequency of occurrence can likely be attributed to sampling variability, low frequency of occurrence in 2006, and/or year to year and seasonal variability (note the seasonal variability observed in the study below).

In addition to the aquatic plant surveys conducted by the Co-Applicant, Department staff designed and conducted a study to qualitatively assess non-target plant impacts from 2007 triclopyr treatments in two 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). Two control plots (untreated) and four plots within treated areas (treatment plots) were included for Lake Morey. Study plots were a subset of data points established by the Co-Applicant in the above mentioned aquatic plant surveys.

Plots were sampled once prior to treatment and at approximately one-month intervals following treatment for three months in Lake Morey. 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 densities 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.

Photographic assessments of relative plant density at the two untreated plots 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. 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.

The Renovate EPA-approved label lists species which are known to be susceptible to the herbicide. Of these, five are found in Lake Morey: *Brasenia schreberi*, *Nuphar variegata*, *Nymphaea* sp., *Pontederia cordata* and *Utricularia purpurea*. *Brasenia schreberi* was recorded at a low occurrence (0.9%) in 2006 and not seen in the post-treatment surveys. *Nymphaea* sp. was found at low frequency of occurrence in all three years, and *Utricularia purpurea* was found for the first time in the lake during the 2006 pre-treatment survey. *Nuphar variegata* and *Pontederia cordata* were not found at all in the 2006 pre-treatment survey. Based on these records, *Brasenia* was the only susceptible species observed to decline, but its low 2006 frequency of occurrence and the possibility of sampling variability and/or seasonal variability (note the seasonal variability observed in the study above) would make it difficult to conclude the decline was a direct result of the herbicide treatment.

Seventeen plant species not found during the 2006 (pre-treatment), 2007 and 2008 aquatic plant surveys (post-treatment) conducted by the Co-Applicant have been found at least once in various surveys conducted by the Department since 1981. Of these species, ten are considered to be intermediate in susceptibility or tolerant of triclopyr. Control of one species, *Phragmites maximus*, would be desirable if it occurred, as this is an invasive wetland plant. Another, *Ranunculus* sp. may not be growing in Lake Morey, as the only sighting has been a single piece of plant found in 1988. The other species are common in Vermont. Since 1981 the DEC has found one rare species in Lake Morey - *Potamogeton vaseyi*. In 1993, this plant was found in five places in the lake. Three of those locations were dense watermilfoil beds that were treated with Renovate in 2007. *Potamogeton vaseyi* was not found in those three areas or anywhere else in the lake in 2006, 2007 or 2008. It is very possible that it has been out-competed by watermilfoil; it is also easily missed during surveys due to its diminutive size and generally low abundance. *Potamogeton vaseyi* is a monocot, and should not be affected by the proposed Renovate treatment. If some *Potamogeton vaseyi* plants do still exist in areas of the lake proposed for treatment, the removal of the watermilfoil should benefit them.

No comments were received from wildlife biologists with the Vermont Department of Fish and Wildlife regarding the proposed 2009 Renovate OTF treatment.

A wetlands ecologist with the Department's Wetlands Office indicated no adverse comments with the project as proposed.

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 ppm 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.

In 2007, Renovate became available for use in a granular formulation. The granular formulation has the same active ingredient (triclopyr) as the liquid formulation but is delivered to the target area(s) via flake (granule). The flake formulation was developed for use in areas of high dilution such as steep sloping shorelines and at deeper water depths where watermilfoil is known to grow and form dense beds. A large percentage of the littoral area (capable of supporting dense watermilfoil beds) in Lake Morey is steep sloping shoreline. In 2007, treatment occurred in four areas of the lake: the north end which is flat and shallow; an adjoining bay and an eastern and western shoreline location. Renovate 3 was proposed for the north end. Renovate OTF was proposed for the other three areas due to their location at steep shoreline areas and the depth at which the watermilfoil is growing.

A fisheries biologist with the Vermont Department of Fish and Wildlife reviewed the permit application submitted for the use of Renovate OTF in Lake Morey and indicated the following concerns regarding potential direct toxicity of Renovate OTF from direct contact and ingestion of the flake by fish. When the water temperature reaches 60 degrees a number of fish species in Lake Morey (largemouth bass, smallmouth bass, rock bass, pumpkinseed, bluegill, and redbreast sunfish) will be in the process of constructing and actively guarding nests and incubating eggs. The use of a solid formulation (Renovate OTF) will result in the deposition of chemical on 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. The fisheries biologist indicated that in order 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. As no study/research had been provided to the Department indicating the level of impact, if any, to address the fisheries biologist's and the Department's concerns, both the 2007 and 2008 Lake Morey ANC Permits included a condition restricting the use of the solid formulation between the time that the water temperature reached 60 degrees through June 22.

In treatment years 2007 and 2008 the Permittee and Co-Permittee indicated that the 60 degree/June 22 restriction imposed hardship for the town as Permittee and ACT, Inc. as the Co-Permittee and project applicator limits the opportunity for treatment times. The most appropriate time for treatment based on the active growth stage of the watermilfoil may in fact fall between the time that the water reaches 60 degrees and June 22.

While drafting this decision a representative from the LMPA called (on April 8, 2009) to request that a decision be put on hold until the Department received and reviewed new information on the product from the manufacturer and vendor. The LMPA representative indicated that they would be providing new information pertinent to the concerns expressed by the fisheries biologist and the Department regarding potential negative impacts to spawning fish and adult fish associated with spawning activities from direct contact or ingestion of the flake. The information, some consisting of confidential documents provided by SEPRO for limited distribution, from a study currently underway and soon to be published, was received by the Department and reviewed by staff and the fisheries biologist.

The confidential data addressed the concern regarding potential elevated triclopyr concentrations in the bottom 6 inches of water, while non-confidential data addressed the concerns over direct toxicity to adult fish through ingestion, and to eggs from direct contact with the Renovate OTF flake formulation of triclopyr (flakes). Based on the information submitted and answers to follow-

up questions posed, Department staff and fisheries biologists concluded that the study and data provides scientific evidence that:

1. the triclopyr concentration in the bottom 6 inches will likely not reach a concentration known to be toxic to fish; and
2. any impact to spawning fish or adults associated with spawning activities from direct contact or ingestion would be absent or minimal at the proposed target concentration due to LD50's that greatly exceed concentrations observed.

This new information indicates the use of the Renovate OTF flake formulation of triclopyr, during spawning season present an acceptable risk to non-target fish species of Lake Morey.

The factors required for an effective treatment (the intent of the Aquatic Nuisance Control pesticide Permit) along with the greatest possible protection for non-target species (both fish and aquatic plants) must be considered when determining the most appropriate timing for a Renovate treatment in Lake Morey. 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 watermilfoil must be actively growing for the treatment to be effective.

The 2008 Lake Morey treatment was conducted on May 13 which was the earliest date that a Renovate treatment had been conducted in Vermont. One consideration, for the early treatment date (earlier than previously conducted in Vermont) was to treat the watermilfoil as soon as it was observed to be actively growing. A one month post-treatment survey revealed impacted watermilfoil in all of the treated areas represented by visual symptoms of herbicidal activity at varying degrees. Watermilfoil stems and leaflets showed some elongation, bending and twisting, which are consistent with the epinasty that occurs with auxin-mimic herbicides like triclopyr. A second post-treatment inspection was performed on July 10. This survey revealed that watermilfoil control had progressed along the northwest shore and at the south end, but watermilfoil along the east and southwest shores appeared to be recovering. The watermilfoil was still bending and twisted however, there appeared to be new growth of leaflets. Watermilfoil begins to grow early in the year in Vermont, and is usually growing shortly after the ice goes off the lake. Although it is growing, it is apparently not sufficiently "actively growing" until later in the season. According to the Applicant and Co-Applicant the 2008 early season treatment resulted in reduced control of watermilfoil which is believed to be one of the factors that lead to the request for treatment in 2009. The second factor as expressed by the Applicant and Co-Applicant is that the watermilfoil was exposed to a sub-lethal dose of triclopyr caused in part by dilution.

Therefore, the Applicant and Co-Applicant propose the following for 2009: 1) a higher rate of concentration (2.5 ppm) and, 2) a later treatment date or the ability to treat at a time when the optimum growth stage for watermilfoil occurs.

In 2008 the Applicant and Co-Applicant requested a higher rate of concentration however, it was denied because at the time there was no evidence to show that a rate of 1.85 ppm was unsuccessful in controlling watermilfoil. Also, a fisheries biologist, a NNHP botanist and the Department were concerned that a higher rate may have negative impacts on the non-target aquatic plants known to be susceptible to triclopyr, and on species, particularly rare species, as well as spawning fish and fish eggs, whose susceptibility at that time was unknown.

The Applicant and Co-Applicant have also proposed to delay treatment until there is more active watermilfoil growth to improve herbicide uptake; treatment is proposed to take place in late May to late June.

Based on experience to date with Renovate OTF treatment in Vermont waters, the stage of watermilfoil growth at the time of treatment appears critical to success. Watermilfoil biomass must be dense enough to provide more stem/leaf surface area for herbicide uptake and may help limit dilution caused by water movement.

The Department recognizes that the 2008 treatment did not achieve the intended result for control of watermilfoil in Lake Morey. The Department intends to accept the request for a higher rate of concentration for Renovate OTF as added insurance of a successful treatment. As stated in the Saratoga Lake, NY report prepared by the Co-Applicant, a rate of 2.03 – 2.23 ppm was used in 2008 to control watermilfoil with success and with little or no impacts to the non-target plants; therefore the Department intends to allow a concentration up to 2.25 ppm. The objective of the treatment for the Applicant, Co-Applicant and the Department is to achieve optimum effectiveness and lengthened watermilfoil control.

The Department also recognizes that the impacts to the non-target environment from Renovate OTF treatments in Vermont to date have resulted in little or no impacts to the non-target environment.

Based on these findings and in order to address the concerns expressed by the fisheries biologist and NNHP staff (as well as the Department) to minimize pesticide use and potential impacts to the non-target environment, the Department restricts the target Renovate OTF concentration in the bottom four feet of the water column in the Lake Morey to a concentration of 1.85 ppm up to 2.25 ppm. In addition, the Department intends to require the Permittee and Co-Permittee to provide documentation to the Department if a concentration of greater than 1.85 ppm is needed for effective triclopyr uptake based on the amount of watermilfoil present for each area proposed. The documentation shall include at a minimum: a qualitative assessment (percent cover) of the density of watermilfoil present, an estimate of the amount (length) of active or new growth of stems and foliage, and an estimate of the amount of watermilfoil growth vertically in the water column. Once the Permittee and Co-Permittee have documented the need for a concentration greater than 1.85 ppm, they may proceed with a treatment. However, if the watermilfoil is in flower in an area or areas designated for treatment, no treatment will be allowed to occur in those areas.

The Department of Fish and Wildlife fisheries biologist and botanist also requested that any and all benthic barrier material located in the designated treatment areas be removed to enable native species to re-colonize those areas following treatment. The Department intends to require the removal of any and all benthic barrier material from areas treated with Renovate by September 30 of the year of treatment.

Renovate may have a direct toxic effect on some terrestrial crop plants. The current label for Renovate OTF has an irrigation precaution that states: “Water treated with Renovate 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.” In 2008 the product label was amended to include the statement that “there is no restriction on use of treated water to irrigate established grasses.” If these precautions are followed it is unlikely that there will be toxic effects on terrestrial plants.

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 other lakes in Vermont where watermilfoil has become widespread and dense. The 2007 Renovate treatment provided watermilfoil reduction/control in three of the four treated areas in Lake Morey. The remaining dense beds of watermilfoil were treated in 2008 with less than favorable results. Low density watermilfoil was found throughout the entire littoral zone. The lowest density and frequency of occurrence was encountered in the north end, which included the 30-acre block that was treated with triclopyr liquid and the 8-acre block that was treated with triclopyr flake in 2007. Again, this suggests good carryover watermilfoil control in these areas. Unfortunately, watermilfoil was regularly encountered throughout the 2008 treatment areas. The south end and northwest shore (north of the state boat launch) had the lowest density watermilfoil. The southwest shore and eastern shoreline had the highest densities. Several small patches were found in these areas where between 10-20% watermilfoil or greater than 20% watermilfoil cover was observed. Therefore, the use of Renovate OTF in year three of the IMP as proposed by the Applicant and Co-Applicant will address the areas of watermilfoil targeted in 2008 with reduced efficacy of watermilfoil control in those areas. This 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 watermilfoil will out-compete the native plants.

The Department therefore finds that the direct impacts of the proposed Renovate OTF 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 Morey because Renovate is relatively selective at low concentrations. As noted above under Potential Direct Effects of Renovate, Department staff observations of study plots and the surrounding areas after the 2007 triclopyr treatment in Lake Morey 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 both the 2007 and 2008 treatments, 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 treatments occur 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 the Renovate treatment in Lake Morey in 2007 and 2008, no algal bloom was noted. No algae blooms due to phosphorus release from decomposing vegetation are anticipated to result from the proposed treatment.

Additional comments were received from the fisheries biologist reiterating the requests/comments received for the Lake Morey ANC Permit #2006-C25. The Department addressed the comments and either included a permit condition requiring the activity or provided discussion in the permit findings at that time and now in this permit.

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 regrowth. In Lake Morey, it has been demonstrated that the sole use of non-chemical control methods can no longer manage the watermilfoil population. The Department believes that the components of the Applicant's long-range management plan including spot/partial-lake chemical treatment in years one, two and three will extend the length of time that non-chemical methods, diver handpulling, suction harvesting and benthic barrier installation conducted by the strong organization of volunteers on Lake Morey 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 Morey, and the potential negative impacts of not treating the watermilfoil population in the areas proposed for treatment, the Department finds that the proposed spot/partial-lake Renovate OTF treatment targeting the remaining areas of watermilfoil in Lake Morey poses an acceptable risk to the non-target environment if it is conducted at a target concentration of 1.85 ppm to 2.25 ppm and in accordance with the product label, the submitted proposal, and the conditions of this permit.

5. Negligible Risk to Public Health

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

The federal product label for Renovate OTF establishes minimum setback distances for application to waterbodies that contain functioning potable water intakes. The label also specifies that if the 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, the label cannot indicate 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, it is not possible to predetermine the exact extent of product use that will occur as actual treatment needs will be finalized based on the results of pre-treatment surveys conducted shortly before application.

Therefore, if Renovate OTF is to be used as proposed, the Department of Health 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, and the assumption that only one product will be applied per growing season.

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 product 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:

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.

The entire lake and the outlet stream downstream to where the stream flows under US Route 5 will be included in the restricted-use area. This encompasses a distance of 1 mile downstream of the lake, exceeding the required setback distance listed on the Renovate OTF label for the Lake Morey treatment scenario (approximately 2,200 feet if all 52 acres to be treated were located adjacent to the outlet of the lake).

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 Morey. The long-range integrated management plan (IMP) proposed by the Applicant for the 2007 Renovate treatment combined the use of chemical and non-chemical control methods over five years to manage the infestation of watermilfoil in Lake Morey. The goal of the five-year IMP, as modified after year one, is to effectively control the dense areas of watermilfoil growth with spot/partial-lake chemical treatments using the aquatic herbicide Renovate (Renovate 3 and Renovate OTF initially and then Renovate OTF only) in the first two (or three) years of the IMP. Non-chemical control methods will be used simultaneously to control scattered watermilfoil growth and regrowth to maximize the length of time that watermilfoil can be effectively controlled in the lake and reduce the frequency and scope of follow-up pesticide treatments. The IMP includes annual early- and late-season watermilfoil surveys to determine if there are areas of dense watermilfoil requiring chemical treatment in the coming year as well as determine the areas where non-chemical control methods - handpulling by volunteers and contract divers, suction harvesting, and benthic barrier installation - will be effective.

The Applicant and Co-Applicant indicated that the 2008 treatment, the second spot/partial-lake treatment conducted in year two of the IMP was scheduled with the intent to treat all of the remaining 50 acres of dense watermilfoil beds in the lake following the 2007 treatment of 30 acres in the northern end of Lake Morey with the aquatic herbicide, Renovate 3 and 15 acres total in three areas of Lake Morey with the aquatic herbicide, Renovate OTF. Based on the reduced efficacy of the 2008 treatment the Applicant and Co-Applicant are proposing a third year of spot/partial-lake treatment in approximately the same areas as treated in 2008 intending to make 2009 the last year during the effective period of the permit to use chemical control methods and instead to use non-chemical control methods for the remainder of the IMP.

The Applicant will conduct 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 likelihood that the lake will be reinfested with watermilfoil or a new invasive species. The Applicant publishes a newsletter and will provide regular updates on the IMP in the newsletter.

To effectively evaluate the best follow-up watermilfoil management strategy as the IMP is implemented, the Department intends to maintain the requirement in ANC Permit #2006-C25 for a meeting with the Applicant on an annual basis prior to initiation of each phase of the IMP.

The Applicant and Co-Applicant have outlined a preliminary budget for the IMP. Full implementation of the five-year plan is estimated to cost \$430,500 in 2006 dollars, \$183,500 for the chemical component of the plan, and \$247,000 for the non-chemical components of the plan. The actual cost will depend on factors such as the amount of area needing spot/partial-lake treatment and the extent and type of non-chemical methods needed. The first year of the IMP was estimated to cost \$141,000, \$69,000 for the Renovate treatment and associated activities, and \$72,000 for non-chemical control methods. The actual cost for the Renovate treatment in 2007 was \$66,877. The cost for implementing non-chemical control methods in year one was \$81,049. The cost of the Renovate treatment in year two of the IMP was estimated to be \$83,350. Non-chemical control methods implemented in year two were estimated to cost \$54,000. The actual cost for the Renovate treatment in 2008 was \$68,000. The cost for implementing non-chemical control methods in year two was \$40,000. The cost of the Renovate treatment in year three of the IMP is estimated to be \$91,025. Non-chemical control methods implemented in year three are estimated to cost \$35,390. Future annual costs for the chemical portion of the IMP (aquatic plant surveys, reports, etc.) are estimated by the Co-Applicant to be: year four - \$10,000; and year five - \$29,500. Annual costs for non-chemical components in years three through five are estimated by the Lake Morey Protective Association to be: year four - \$42,000; and year five - \$35,000.

By continuing to employ all of the components identified above in an integrated fashion over five years, the Applicant is seeking to selectively control watermilfoil in Lake Morey to restore recreational uses while preserving and promoting the recovery of a healthy native aquatic plant community. The long-term objectives of the management program are to (1) target control of the dense watermilfoil beds; (2) prevent the establishment of other non-native and potentially invasive species; (3) preserve a diverse native plant assemblage for fish and wildlife habitat; (4) avoid any adverse impacts on water quality; and (5) improve recreation for multiple user groups, including: fishing, rowing, sailing, power boating and swimming.

While the IMP is only a five-year plan, the Applicant recognizes that eradication is not attainable and management of watermilfoil will be an annual undertaking that needs to continue well beyond the five years. A diligent and sustained effort in the years in the IMP and beyond will be required to prevent Lake Morey from becoming reinfested with watermilfoil to the point where recreational uses and the ecology of the lake are threatened.

The Department finds that the Applicant has incorporated a schedule of pesticide minimization over the long term by developing a plan that reduces watermilfoil growth using spot/partial-lake treatments during the five-year plan, with all dense watermilfoil beds treated in the first three years of the plan, rather than a whole-lake treatment in a single season with follow-up treatments during the IMP. Substantial non-chemical control efforts are also planned to reduce the need for follow-up pesticide treatments. The Department finds that the five-year IMP has a reasonable chance of achieving its goal. The Department recognizes that there is a potential for the chemical treatment and the non-chemical control efforts to be unsuccessful at managing the watermilfoil population. Any request by the Applicant to conduct a future chemical treatment to control the watermilfoil

population will be evaluated in light of the success of the Renovate treatments to-date and the intensity of the non-chemical control efforts conducted by the Applicant.

The Department would consider the IMP to be successful if at the end of the five-year IMP, watermilfoil in Lake Morey is manageable by efforts other than a whole-lake chemical treatment in a single season with follow-up treatments during the IMP, and a strong framework exists for continuing the management efforts indefinitely.

7. Public Benefit

The use of the aquatic herbicide Renovate OTF to selectively treat up to 52 acres of watermilfoil in Lake Morey as part of an integrated management plan that combines chemical and non-chemical control technologies will provide a public benefit. In a 2006 town-wide survey conducted by the Fairlee Planning Commission, 96% of the 294 respondents stated that “the milfoil in Lake Morey is the greatest economic and environmental issue for the town of Fairlee.” In 2006 the abundance and distribution of watermilfoil in the lake suggested that the population was poised to rapidly spread throughout the remainder of the lake’s littoral area unless a more aggressive management program was initiated. The 2007 Renovate treatment did significantly reduce watermilfoil growth in three of the four treated areas. The 2008 Renovate treatment targeting the remaining dense watermilfoil beds in the lake did reduce the amount of watermilfoil in the lake however the Applicant and Co-Applicant indicated in the Co-Applicant’s 2008 aquatic plant survey that the level of control did not meet with expectations. Therefore, the 2009 spot/partial-lake treatment in approximately the same areas as less than effectively treated in 2008 is proposed. The proposed treatment is intended to further reduce the lakewide watermilfoil population and extend the length of time that diver handpulling, suction harvesting and benthic barrier installation conducted by the strong organization of volunteers on Lake Morey with contracted assistance will be able to manage the watermilfoil. This extended time of watermilfoil control will benefit the native aquatic plant community and promote habitat diversity in the lake by allowing native plant species to successfully compete against watermilfoil. The proposed project will also improve the recreational use of the lake for multiple uses including swimming and boating. The Department intends to require that treatment occur only on Monday through Thursday to avoid the need to close the lake to recreational use on a weekend. Weekends are typically when the highest recreational use occurs, and the opening of the fishing season and fishing tournaments are typically scheduled for weekends.

Continued control of watermilfoil in Lake Morey will also help prevent watermilfoil fragments from being easily transported from this lake to other bodies of water on boat motors and trailers.

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 \$250.00, 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 5 day of May 2009

Laura Q. Pelosi, Commissioner
Department of Environmental Conservation

By _____/S/_____
Peter Laflamme, Director
Water Quality Division

**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
Areas Approved for Renovate OTF Treatment
Required Sample Sites – O

Attachment C

**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 as approved by issuance of Aquatic Nuisance Control (ANC) Permit #2009-C01 to control Eurasian watermilfoil in Lake Morey in Fairlee, 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