Aquatic Nuisance Control Individual Permit Application Denial
Under 10 V.S.A. § 1455

VERMONT DEPARTMENT OF ENVIRONMENTAL CONSERVATION
WATERSHED MANAGEMENT DIVISION
LAKES & PONDS PROGRAM

Applicant Information	
Applicants: Lake Bomoseen Association and Lake Bomoseen Preservation Trust Co-applicant: SOLitude Lake Management Decision Number: 3642-ANC-C	Control Activity: Pesticide (Herbicide – SePRO ProcellaCOR® EC) Waterbody: Lake Bomoseen, Castleton and Hubbardton

a. Findings

1. Jurisdiction - 10 V.S.A. § 1455(a). Within waters of the State, no person may use pesticides, chemicals other than pesticides, biological controls, bottom barriers, structural barriers, structural controls, or powered mechanical devices to control nuisance aquatic plants, insects, or other aquatic nuisances, including lamprey, unless that person has been issued a permit by the Secretary of the Agency of Natural Resources (Secretary). The control activity, as described in permit application #3642-ANC-C, involves the use of a pesticide, SePRO ProcellaCOR® EC, to control Eurasian watermilfoil, *Myriophyllum spicatum*, within the waters of Lake Bomoseen in Castleton and Hubbardton. Therefore, the Secretary has jurisdiction over the proposed project under 10 V.S.A. Chapter 50.

2. Application Receipt & Review. The Secretary received an Aquatic Nuisance Control Individual Permit application from the Lake Bomoseen Association, the Town of Hubbardton, and SOLitude Lake Management on February 1, 2022. Upon receipt of the application, the Secretary proceeded in accordance with the permit process as identified under 10 V.S.A. Chapter 170 and reviewed the application in accordance with the Department of Environmental Conservation's Permit Application Review Guidance, adopted March 14, 2019.

   The application was updated on March 11, 2022, to remove the Town of Hubbardton as an applicant from the application. The application was updated on April 15, 2022, to add the Lake Bomoseen Preservation Trust as an applicant to the application. On May 27, 2022, the applicants requested that the Secretary temporarily pause technical review of the application. On December 13, 2022, the applicants requested that the Secretary resume technical review of the application.

   The Secretary shall issue an Aquatic Nuisance Control permit for the use of pesticides in waters of the State for the control of nuisance aquatic plants pursuant to 10 V.S.A. § 1455 (d) if all the following findings can be made:

   (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 a pesticide or, in the case of a pond located entirely on a landowner's property, no undue adverse effect upon the public good.

   After reviewing the specific elements of this permit application to control Eurasian watermilfoil in Lake Bomoseen, the Secretary was unable to affirmatively find that there is an acceptable risk to the non-target environment, there is a long-range management plan which incorporates a schedule of pesticide minimization, or that there is a public benefit to be achieved from the application of a pesticide as described in permit application #3642-ANC-C. As such, the application must be denied.

3. Background; Aquatic Nuisance Control Permit History. Lake Bomoseen is a 2,415-acre waterbody that drains into an unnamed stream, which then flows into the Castleton River. Eurasian watermilfoil was first confirmed in Lake Bomoseen in 1982. Permitted control methods for Eurasian watermilfoil in Lake Bomoseen include bottom barriers, powered mechanical devices, and biological controls (*Euhrychiopsis lecontei*). The following is a summary of active Aquatic Nuisance Control permits within Lake Bomoseen.

   - Bottom barriers: 2204-ANC expires 6/6/2027 and 3256-ANC-B expires 3/4/2031.
   - Powered Mechanical Devices: 2015-H01 expires 5/14/2025, 2015-H02 expires 5/14/2025, and 3255-ANC-H expires 3/4/2031.

   The proposed project is to control Eurasian watermilfoil, an aquatic invasive species. The Vermont Agency of Agriculture, Food and Markets designates Eurasian watermilfoil as a Class B Noxious Weed under the Noxious Weeds Quarantine Rule. The US Department of Agriculture National Invasive Species Information Center lists Eurasian watermilfoil as an invasive species. The US Geological Survey has placed Eurasian watermilfoil on its list of Nonindigenous Aquatic Species, which lists the impacts of Eurasian watermilfoil infestations as follows:

   - Now considered a major nuisance species throughout the Northeast, Northern Midwest, and Pacific Northwest of the US (Couch and Nelson 1985; Patten 1956; White et al. 1993), Eurasian watermilfoil competes aggressively to displace and reduce the diversity of native aquatic plants. It elongates from shoots initiated in the fall, beginning spring growth earlier than other aquatic plants. Tolerant of low water temperatures, it quickly grows to the surface, forming dense canopies that overtop and shade the surrounding vegetation (Madsen et al. 1991). Canopy formation and light reduction are significant factors in the decline of native plant abundance and diversity observed when Eurasian watermilfoil invades healthy plant communities (Smith and Barko 1990; Madsen 1994).
   - Eurasian watermilfoil has less value as a food source for waterfowl than the native plants it replaces (Aiken et al. 1979). And although fish may initially experience a favorable edge effect, the characteristics of Eurasian watermilfoil's overabundant growth negate any short-term benefits it may provide fish in healthy waters. At high densities, its foliage supports a lower abundance and diversity of invertebrates, organisms that serve as fish food (Keast 1984). Dense cover allows high survival rates of young fish; however, larger predator fish lose foraging space and are less efficient at obtaining their prey (Lillie and Budd 1992; Engel 1995). Madsen et al. (1995) found growth and vigor of a warm-water fishery reduced by dense Eurasian watermilfoil cover. The growth and senescence of thick vegetation degrades water quality and depletes dissolved oxygen levels (Honnell 1992; Engel 1995). Typical dense beds restrict swimming, fishing, and boating, clog water intakes and result in decaying mats that foul lakeside beaches.

4. Control Activity Purpose. The purpose of the proposed control activity was to begin using ProcellaCOR® EC as a part of an integrated pest management plan to manage an established population of an aquatic invasive species (Eurasian watermilfoil) to improve the public good uses of Lake Bomoseen.

5. Acceptable Risk to the Non-Target Environment – 10 V.S.A. 1455(d)(2). The Secretary considers the following as the non-target environment:

   - Aquatic plants and animals within the waterbody proposed for treatment and waters up to one mile downstream of the waterbody.
   - Wetlands within the waterbody proposed for treatment and wetlands within the outlet waters up to one mile downstream of the waterbody.

- Human use of waters treated with the pesticide. This includes, hydroponic farming, greenhouse and nursery plants, and all locations irrigated with waters treated with ProcellaCOR® EC.
- The ecological integrity of the waterbody, which is the culmination of how the biological, chemical, and physical integrity of the waterbody interact. The concept of ecological integrity is identified in the Vermont Department of Environmental Conservation Watershed Management Division's Statewide Surface Water Management Strategy.

For determining what might be considered an acceptable risk to the non-target environment from a proposed treatment, the Secretary made baseline assumptions related to the non-target environment:

- A control activity for Eurasian watermilfoil will have an impact on the ecological integrity of the waterbody as the non-target environment cannot be avoided completely.
- Rare and State threatened aquatic plant species have been recorded as being present in Lake Bomoseen. Species observed include whorled watermilfoil (S2S3), *Myriophyllum verticillatum*; slender naiad (S2), *Najas gracillima*; Fries' pondweed (S3), *Potamogeton friesii*; blunt-leaf pondweed (S3), *Potamogeton obtusifolius*; straight-leaf pondweed (S2S3), *Potamogeton strictifolius*; marsh mermaidweed (S2S3), *Proserpinaca palustris*; small bur-reed (S2S3 – State Threatened), *Sparganium natans*; fruited bladderwort (S3), *Utricularia geminiscapa*; humped bladderwort (S3), *Utricularia gibba*; lesser bladderwort (S3), *Utricularia minor*; little floating bladderwort (S2S3), *Utricularia radiata*; and horned pondweed (S1S2), *Zannichellia palustris*.
    - Those species are not listed as being controlled by ProcellaCOR® EC as identified on the product label. However, *Myriophyllum verticillatum* and *Proserpinaca palustris* are close relatives to Eurasian watermilfoil (same Family – Haloragaceae). Therefore, it would be anticipated that *Myriophyllum verticillatum* and *Proserpinaca palustris* would be controlled by ProcellaCOR® EC, and as such, negatively impacted. In addition, both *Myriophyllum verticillatum* and *Proserpinaca palustris* are species that often occur within wetlands. Based on the aquatic plant survey in the application, *Myriophyllum verticillatum* was recorded as being present within the waters north of Grady Bridge. *Proserpinaca palustris* has not been observed in Lake Bomoseen since 1977. While not observed in recent years, there is a potential that this species still resides within the wetland complex located north of Grady Bridge.
- Native aquatic plants controlled by ProcellaCOR® EC as identified on the product label have been recorded as being present in Lake Bomoseen. This includes watershield (*Brasenia schreberi*) and coontail (*Ceratophyllum demersum*). In previous correspondence with the co-applicant, it was identified that season long and sometimes multi-season control of *Brasenia schreberi* can occur from a treatment concentration of 4 Prescription Dose Units (PDU). However, protection of *Brasenia schreberi* can occur using a 2 PDU or less range, although impacts may be observed at that concentration that last a few weeks before plants start to recover. The product label identifies *Ceratophyllum demersum* as being less sensitive to ProcellaCOR® EC and that a higher application rate may be required to control it. The applicant identified that *Ceratophyllum demersum* will most likely only be impacted at a treatment concentration of greater than 4 PDU. Based on observations from treatments conducted in previous years, it has been observed that white water lily (Ny*mphaea odorata*) and yellow water lily (*Nuphar variegata*) may also be sensitive (not controlled/sublethal) to ProcellaCOR® EC. Impacts to those species include slight discoloration, slight stem twisting, and leaf curling. However, plants grew out of those impacts after a period of several weeks after a treatment.

- All of the aforementioned aquatic plant species that are controlled or sensitive to ProcellaCOR® EC often occur within wetlands. Based on the aquatic plant survey in the application, all of these species are recorded as being present in the wetland complex located north of Grady Bridge.

- There are a number of mapped Class II wetlands located along the shoreline of Lake Bomoseen. In addition, the majority of Lake Bomoseen located north of Grady Bridge is a mapped Class II wetland. The Secretary's Wetlands Program provided the following information related to this wetland regarding its significance to Lake Bomoseen:

  - The Lake Bomoseen Wetland (LBW) complex is located entirely within the Town of Hubbardton, at the northern end of Lake Bomoseen. The wetland is approximately 450 acres in size. Water enters the northern end of the lake and the wetland from Austin Pond and several small streams. Lake Bomoseen encompasses two thousand four hundred and five (2,405) acres.

    There are several natural community types within and bordering the LBW that have been documented by the Agency of Natural Resources (ANR). These are Red Maple Swamp, Hardwood-Cedar Swamp, Intermediate Fen, Cattail Marsh, Deep Rush Marsh, and Shallow Shrub Swamp.

    The State of Vermont ranks the significance of wetlands based on 10 functions and values they provide for the general public and the environment. According to these criteria, the LBW complex north of Float Bridge is highly significant for 9 of the ten functions and values:

    LBW Significant Functions and Values:

    - Surface & ground water protection (5.2);
    - Fisheries habitat (5.3);
    - Wildlife & migratory bird habitat (5.4);
    - Exemplary wetland natural community (5.5);
    - Threatened & endangered species habitat (5.6);
    - Education & research in natural sciences (5.7);
    - Recreational value & economic benefits (5.8);
    - Open space & aesthetics (5.9); and
    - Erosion control (5.10).

    This wetland is a dynamic system offering a variety of habitats for different species and supports a number of RTE species currently and likely in the future. Lake Bomoseen and the LBW are utilized extensively by hunters, anglers, boaters, swimmers, tourists, and shoreline residents for recreation and for enjoyment of its scenic beauty. The functions and values the wetland provides helps to support the local economy and a thriving lake community.

- As identified in the ProcellaCOR® EC Safety Data Sheet, the product is practically non-toxic to fish on an acute basis and the material is slightly toxic to aquatic invertebrates on an acute basis. Ecotoxicity studies were based on the maximum application rate of 50 parts per billion. Results indicate that parent compound and degradates show toxicity levels at well above the maximum application rate, meaning that toxicity levels are minimal at proposed application rates. Therefore, the potential for

acute risk to fish, invertebrates, amphibians, birds, and mammals is expected to be low. Chronic toxicity of concern would be short lived due to rapid degradation in the environment, and rapid dilution from spot application use pattern.

- The presence of aquatic vegetation is required for fish and wildlife habitat. Generally, Eurasian watermilfoil has been identified as providing poor fish and wildlife habitat compared with native aquatic vegetation. The removal of Eurasian watermilfoil promotes native plant biodiversity, which improves the biological integrity of the lake over time. However, Eurasian watermilfoil may provide beneficial structural habitat in the absence of other aquatic vegetation. The Secretary's Fish and Wildlife Department provided the following information related to the relationship between aquatic plant communities and the Lake Bomoseen fishery:
    - Lake Bomoseen, the largest inland lake in Vermont, is no different with a diverse aquatic macrophyte community that supports several important sportfish populations, including largemouth bass, bluegill, pumpkinseed sunfish, black crappie, yellow perch, and northern pike. This popular fishery draws many anglers from all over the state and the region. It is considered one of the premier bass fisheries in the state and is second only to Lake Champlain in popularity and in the number of fishing tournaments permitted by VTFWD each year. Lake Bomoseen is also one of the few waters in the state that contains a population of redfin pickerel *Esox americanus americanus* – a medium priority Species of Greatest Conservation Need. Redfin pickerel are dependent on dense stands of aquatic vegetation for concealment while foraging but is a generalist in terms of species composition used for cover. VTFWD surveys have found this species in all established fish survey index sites containing medium to dense vegetation, with the highest abundances found above the Float Bridge in the north Lake Bomoseen Wetland and in the Bomoseen Outlet.

      The 2017 Vermont Statewide Bass Management Plan summarized largemouth and smallmouth bass population data for waters across the state, and Lake Bomoseen was consistently ranked as one of the top waters in Vermont for several metrics including catch rate, size, and age distribution. The mean age and size of bass in Lake Bomoseen is one of the highest in the state underscoring the quality angling opportunities it provides.
- Lake Bomoseen and its waters are public, and it is reasonable to assume that all public waters may be used for irrigation.

Assessment: The control activity was for the use of the aquatic herbicide ProcellaCOR® EC. This was proposed to control Eurasian watermilfoil only, which is an aquatic invasive species. The ProcellaCOR® EC product label identifies ProcellaCOR® EC as a selective systemic herbicide for management of freshwater aquatic vegetation in slow-moving/quiescent waters with little or no continuous outflow (e.g., lakes, ponds, reservoirs, wetlands) as well as in slow-moving/quiescent areas of rivers (e.g., coves, oxbows).

ProcellaCOR® EC is highly specific to controlling Eurasian watermilfoil when used at low concentrations. Negative impacts on beneficial native aquatic plants are anticipated to be minimal to none (i.e., an acceptable risk). In April 2022, the Secretary completed a pre- and post-treatment statistical analysis of the aquatic plant survey data from Vermont waterbodies treated with ProcellaCOR® EC. In summary, the analysis showed that after a ProcellaCOR® EC treatment, there was a statistically significant decrease of the lake-wide frequency of occurrence for Eurasian watermilfoil (target aquatic invasive species) and coontail (non-target native species) as well as there being a statistically significant increase of the lake-wide frequency of occurrence for the beneficial native species Illinois pondweed and American eelgrass. The impact on coontail was anticipated as that is a species that is listed as being controlled on the ProcellaCOR® EC product label.

However, this impact has been determined to be an acceptable risk for several reasons as there are measures that can be taken to avoid and reduce this impact:

- The product label identifies that higher treatment concentrations may be required to control coontail, meaning that treatment concentrations can be reduced in areas where a treatment may overlap with a coontail population.
- Treatment areas can be delineated to avoid known locations of coontail populations.
- While there was an observed decline in the frequency of occurrence for coontail post-treatment, coontail populations recover, continue to persist, and have not been extirpated from a waterbody.

Regarding the statistically significant increase in several beneficial native aquatic plant species and the remainder of native aquatic plant species having no observable impact, this is viewed as a positive impact on the overall biological integrity of native aquatic plant community. These results demonstrate that targeted Eurasian watermilfoil control projects are not resulting in the suppression of all aquatic plant species lake wide, that native plant species can reestablish in areas once dominated by Eurasian watermilfoil, and that the general benefits of the structural habitat provided by aquatic plants remain.

As to how ProcellaCOR® EC interacts with other aspects of the non-target environment, it has been demonstrated that the potential for acute and chronic risks to fish, aquatic invertebrates, amphibians, and other aquatic animals is considered low at application rates of 3 – 5 Prescription Done Units (PDU) per acre-foot (range 5.79 – 9.65 ppb/acre foot). Any potential chronic toxicity of concern would be short lived due to dissipation in the environment. Acute and chronic risks are further limited by the functional solubility of the product. ProcellaCOR® EC exhibits low water solubility (~15 ppb), and in laboratory aquatic ecotoxicity studies, the highest concentration that could be dissolved in the test water was approximately 40-60 ppb. In addition, the potential for acute risk to macroinvertebrates is expected to be low, and this finding has been confirmed for invertebrates based on a study conducted by the New York DEC on a Peconic River ProcellaCOR® EC treatment area.

Based on the permit application, the proposed management plan for Eurasian watermilfoil involved three consecutive years of ProcellaCOR® EC treatments beginning north of Grady Bridge and moving south to the outlet. Treatment acreages were proposed to start with 223.5 acres, followed by 188.6 acres, and finalized with 209.5 acres. This approximately 622-acre area is a part of the applicant's identified 672 acres of "manageable littoral zone." Within that area of littoral zone, the applicant's aquatic plant survey identified Eurasian watermilfoil densities as ranging from scattered to dense. An approximately additional 253 acres of littoral zone located at the northern end of Lake Bomoseen was excluded from the proposed management area. This excluded area is a part of the Lake Bomoseen wetland complex as previously identified by the Wetlands Program and was not a part of the aquatic plant survey that was submitted with the application.

As a measure to reduce potential non-target impacts on the ecological integrity of waterbodies from permitted projects for the control of a well-established population of Eurasian watermilfoil, the Secretary has adopted a practice of limiting the annual cumulative area of Aquatic Nuisance Control projects to be no more than 40% of the littoral zone. As proposed, the three-year treatment plan would have followed the 40% littoral zone control limitation. However, the overall proposed treatment plan did not adequately avoid or minimize impacts to aquatic plants, aquatic animals, wetlands, and the overall ecological integrity of Lake Bomoseen.

Adequate measures to avoid or minimize impacts to aquatic plants sensitive to or controlled by ProcellaCOR® EC were not included in the application. Given that all non-target native aquatic plants present in Lake Bomoseen that are sensitive to or controlled by ProcellaCOR® EC often grow within wetlands, treatment

locations within wetlands or the wetland buffer should be avoided. Areas of wetlands were not avoided in the proposed management plan. Additionally, if a treatment location cannot be avoided and that location has non-target aquatic plants that are controlled by ProcellaCOR® EC (i.e., *Brasenia schreberi* and *Ceratophyllum demersum*), treatment concentrations should be reduced as necessary to minimize negatively impacting those populations. This measure to reduce impacts on native non-target aquatic plant species was not included in the application.

In consultation with the Agency's Wetlands Program and Fish Division, it was identified that the Lake Bomoseen wetland complex is critically important to Lake Bomoseen. As proposed in the permit application, ProcellaCOR® EC treatments were proposed to occur within the areas north of Grady Bridge (i.e., within the Lake Bomoseen wetland complex). Given the unique and ecologically important nature of this wetland complex in relation to the overall biological integrity of Lake Bomoseen and to specific aquatic plant and animal species that primarily occur within this area that could be significantly negatively impacted by ProcellaCOR® EC treatments (either directly or indirectly through alteration of habitat), the Secretary determined that ProcellaCOR® EC treatments in this area pose an unacceptable risk to the non-target environment.

If the project were to proceed, there are recommended use restrictions identified on the product label for hydroponic farming, greenhouse, nursery plants, and irrigation of landscape vegetation. These recommended use restrictions are limited and would likely be temporary as ProcellaCOR® EC is expected to dissipate rapidly due to its rapid photolysis and aerobic aquatic metabolism.

The Secretary has determined that there is not an acceptable risk to the non-target environment. As such, the application must be denied.

6. Long-range Management Plan – 10 V.S.A. 1455(d)(4). Aquatic invasive species are considered stressors on Vermont's surface waters. Eurasian watermilfoil, an aquatic invasive species, has spread throughout Lake Bomoseen, is well-established, and eradication is a highly unlikely outcome from control efforts. Eurasian watermilfoil is and will continue to be a part of the aquatic environment of Lake Bomoseen for the foreseeable future. As such and as required by this finding, any long-range management of this species must include pesticide minimization measures.

   As applied for, the applicant developed a management plan that would use a combination of chemical and non-chemical control methods to be a part of an integrated pest management plan to control nuisance levels of Eurasian watermilfoil. However, the proposed management plan involved three consecutive years of ProcellaCOR® EC treatments beginning north of Grady Bridge and moving south to the outlet. Treatment acreages were proposed to start with 223.5 acres, followed by 188.6 acres, and finalized with 209.5 acres. This approximately 622-acre area is a part of the applicant's identified 672 acres of "manageable littoral zone." Within that area of littoral zone, the applicant's aquatic plant survey identified Eurasian watermilfoil densities as ranging from scattered to dense.

   While the applicant proposed to follow the Secretary's previously established practice of limiting the annual treatment area to no greater than 40% of the littoral zone, the Secretary determined that this long-range plan did not adequately include pesticide minimization measures as the proposed use of ProcellaCOR® EC was to treat nearly all of the developed shoreline of Lake Bomoseen regardless of Eurasian watermilfoil density, Eurasian watermilfoil's impacts on public good uses, or the potential impacts on the non-target environment.

   In consultation with the Agency's Wetlands Program and Fish Division, the following are additional measures that would need to be included in a long-range management plan for Eurasian watermilfoil in Lake Bomoseen to adequately incorporates pesticide minimization measures:

I. Treatment locations should be concentrated to the following areas:

i. Areas of Eurasian watermilfoil growth that are negatively impacting public good uses (e.g., boating/navigation, swimming).

ii. Areas of shoreline development.

iii. Areas of at least moderate Eurasian watermilfoil density.

iv. Areas that are strategically located for invasive species management purposes (e.g., boat access areas).

II. Treatment locations should avoid locations with known populations of native non-target species that are either controlled by, related to a species that is controlled by, or sensitive to ProcellaCOR® EC, unless it can be demonstrated that the overall lake-wide population of the native non-target species in question will not be significantly impacted.

III. Treatment locations should avoid wetlands and wetland buffers as many native non-target species that are controlled by ProcellaCOR® EC (i.e., coontail, watershield) are in that habitat. All areas of Lake Bomoseen north of Grady Bridge should not be a part of the potential ProcellaCOR® EC treatment areas. The area north of Grady Bridge is predominantly a Class II wetland and this wetland habitat is instrumental in providing Lake Bomoseen with one of the most diverse fisheries in the State. This area also supports a robust diversity of plant and animal species, including the rare plant species *Myriophyllum verticillatum* (a relative of Eurasian watermilfoil and is anticipated to be controlled by ProcellaCOR® EC) and redfin pickerel (a Species of Greatest Conservation Need, this species is dependent on dense stands of aquatic vegetation and Department of Fish and Wildlife surveys have found the highest abundances of this species north of Grady Bridge).

IV. Treatment locations should avoid locations where other active aquatic plant management is occurring, or control activities should be coordinated to ensure various control techniques work towards a mutual management goal or do not adversely impact the goals of the other project.

The Secretary has determined that a long-range management plan that adequately incorporates a schedule of pesticide minimization has not been developed. As such, the application must be denied.

7. Public Benefit – 10 V.S.A. 1455(d)(5). In the context of the Secretary's review of an Aquatic Nuisance Control permit application, public benefit means that the proposed control activity is anticipated to have net positive effects on the public good in a manner that outweighs the potential negative effects on the public good from the control activity or the potential negative effects on the public good from not controlling the targeted aquatic nuisance.

   The Secretary has developed a series of considerations to determine whether there is a public benefit from the proposed control activity. This review operates on a sliding scale such that as the potential adverse impacts of a proposed control activity increase, the burden on the applicant to demonstrate that the control activity provides a public benefit also increase. An applicant must demonstrate that the public benefits outweigh any adverse impact the project may have in order to meet this finding.

   Based upon the following assessments, the Secretary has determined that the tangible benefits to the public good from the proposed project do not outweigh the potential negative impacts. As applied for, the Secretary finds that there is a not a public benefit to be achieved from the application of a pesticide. As such, the application must be denied.

The Secretary considered the following criteria in determining whether there is a public benefit to be achieved from the application of the pesticide:

A. Whether carrying out the control activity produces tangible benefits to public good uses, such as boating, fishing, and swimming, that outweigh potential impacts on the water resource.

Assessment: If the project were to occur, tangible short-term benefits to public good uses are likely to be associated with the temporary decrease in the frequency of occurrence and biomass of Eurasian watermilfoil. This temporary decrease is anticipated to benefit boating and swimming within the treatment locations. It remains undetermined as to whether the control activity would produce a tangible short or long-term benefit to fishing. The presence of aquatic vegetation is required for fish and wildlife habitat. Generally, Eurasian watermilfoil has been identified as providing poor fish and wildlife habitat compared with native aquatic vegetation. However, Eurasian watermilfoil may provide beneficial structural habitat in the absence of other aquatic vegetation.

As proposed in the application, to reduce the potential negative impact to fishing as a result of impacts to fish and wildlife habitat from aquatic plant management, the applicant proposed to limit annual control areas to no more than 40% of the littoral zone. The Secretary has previously required this limitation for other long-term lake wide Eurasian watermilfoil management projects. However, as proposed, the treatment strategy did not adequately incorporate other protective measures for the non-target environment or adequately include pesticide minimization measures, and as such, benefits to public good uses would not be anticipated to have outweighed potential negative impacts on the water resource.

If the project were not to occur, it would be anticipated that where dense beds of Eurasian watermilfoil are located, there would continue to be negative impacts on swimming and boating.

B. Whether the potential cumulative impacts from carrying out the control activity adversely affect the water resource and the public that utilizes that resource.

Assessment: Additional cumulative impacts were considered that relate to the water resource and how the public may utilize that resource. The Secretary has determined that the cumulative impacts from carrying out the control activity may negatively affect the water resource and the public that utilizes that resource.

I. Lake Bomoseen is currently a waterbody that is dominated by aquatic plants within the littoral zone as opposed to being dominated by algal species. Aquatic plants utilize the available nutrients in this waterbody, thereby limiting the available nutrients for algal species. As proposed in the application as a measure to maintain this current aquatic plant dominated clear water steady state and to prevent algal species from becoming dominant and potentially impacting the water resource and the public that utilizes that resource, no more than 40% of the littoral zone would be targeted annually by aquatic plant management activities.

II. Treating dense populations of Eurasian watermilfoil with ProcellaCOR® EC (a spot treatment herbicide with relatively short exposure times) will rapidly increase the biological oxygen demand as the Eurasian watermilfoil decomposes, which may deplete concentrations of dissolved oxygen and result in anoxia. Anoxia has the potential to result in a die-off of aquatic animals, which if that were to happen, it would negatively impact the water resource and potentially impact how the public utilize that resource. As proposed in the application as a measure to reduce this potential impact, no more than 40% of the littoral zone would be targeted annually by aquatic plant management activities.

III. Lake Bomoseen is not located within a Groundwater Source Protection Area or a Surface Water Source Protection Area. It is anticipated that there would be no impact on Surface Water or Groundwater Source Protection Areas if the project were to occur.

IV. On Lake Bomoseen, there is a Vermont State Park, two Vermont Fish and Wildlife Department public boat launches, a State Conservation Camp, a municipal beach, as well as private marinas that offer services related to public access and public good uses. If the project were to occur, impacts on the public that utilize the water resource are anticipated to be temporary and minor as it is expected that ProcellaCOR® EC will dissipate rapidly to a reduced concentration due to its rapid photolysis and aerobic aquatic metabolism.

i. When ProcellaCOR® EC is used, there are no mandatory water use restrictions for recreational purposes, including swimming and fishing, or drinking water. However, for projects that include the use of ProcellaCOR® EC, the Secretary has previously recommended that on the day of treatment, no use of the treated waterbody and associated outlet stream for up to one mile downstream occur for any purpose, including swimming, boating, fishing, irrigation, and all domestic uses. On the day of treatment, the Secretary has previously required permittees to supply potable upon request to those who depend upon the treated waterbody or its outlet stream for up to one mile downstream for domestic use to prepare food or drink. Within four weeks after a treatment, would be anticipated that all Eurasian watermilfoil within a treatment area would be controlled and no longer present within a treatment area. It is recommended to not compost aquatic plant material from a treatment location for up to four weeks after the day of treatment to avoid any potential contamination of compost. Additional advisories and recommendations related to irrigation and the use of treated waters are listed under the following sections of the ProcellaCOR® EC Specimen Label: *Use Precautions*, *Use Restrictions*, *Application to Waters Used for Irrigation on Turf and Landscape Vegetation*, *Residential and other Non-Agricultural Irrigation*, and *TABLE 1: Non-agricultural irrigation following in-water application*.

ii. ProcellaCOR® EC (active ingredient florpyrauxifen-benzyl) has been demonstrated to dissipate rapidly to a reduced concentration due to its rapid photolysis and aerobic aquatic metabolism. Using a minimum concentration detection limit of 1 part per billion (ppb), nearly 100% of post treatment sampling from ProcellaCOR® EC treatments in Vermont have found that ProcellaCOR® EC is undetectable in the water 48 hours after treatment. The outlet of Lake Bomoseen flows into an unnamed tributary of the Castleton River. Due to its rapid degradation, it would be anticipated that at most, reduced concentrations of ProcellaCOR® EC might flow downstream until complete breakdown of the pesticide occurs.

V. During the investigation of this application, the Secretary received letters from the Selectboards of Castleton (has Lake Bomoseen shoreline), Hubbardton (has Lake Bomoseen shoreline), Fair Haven (has receiving waters from Lake Bomoseen), and Shrewsbury (regionally adjacent to Lake Bomoseen). All four municipalities were opposed to the application of herbicide to control Eurasian watermilfoil in Lake Bomoseen. Opposition to the application was primarily related to the potential unknown risks associated with the use of herbicide and instead recommended other control techniques be used to control Eurasian watermilfoil. In addition, this application generated considerable public interest. A significant portion of that public response to the proposed project was in opposition to the application as demonstrated by frequent communications to the Secretary, social media efforts, protests, and legislative efforts (i.e., H.31).

Historically, Aquatic Nuisance Control applications for Eurasian watermilfoil control using an integrated management strategy have been submitted by municipalities, lake associations, or a combination of the two. The governing statute allows any person to apply for an ANC permit, and the Agency evaluates all applications objectively for compliance with the standards regardless of the applicant. The Secretary also objectively evaluates all public comments and feedback received on a proposed project. Public interest informs the Secretary's evaluation of public benefit to the extent the feedback provided by the public, including municipal governments and local lake associations, articulates clear reasons why the project either benefits or adversely impacts the public. The applicants for this project are two lake associations. While these associations are considered to represent a degree of public interest, their support for the project does not wholly represent a favorable public interest in the project.

C. Whether measures to reduce impacts on the water resource have been taken.

Assessment: As outlined under sections a.5. and a.6. of this decision, the proposed project does not pose an acceptable risk to the non-target environment nor was a long-range management plan that incorporates a schedule of pesticide minimization developed. While measures to reduce impacts on Lake Bomoseen were included in this application (i.e., proposing the use of an herbicide that is highly specific at controlling Eurasian watermilfoil that has been demonstrated as having minimal to manageable negative impacts on non-target environment as well as and proposing to limit the annual treatment areas of Eurasian watermilfoil to no greater than 40% of the littoral zone of Lake Bomoseen), those measures were determined to not be adequate to reduce impacts on the water resource.

D. Whether the control activity is excessive for the stated purpose.

Assessment: The proposed project was to control Eurasian watermilfoil, an aquatic invasive species, throughout the majority of Lake Bomoseen (excluding approximately 253 acres of Class II wetland located at the northern end of Lake Bomoseen). Eurasian watermilfoil was first confirmed in Lake Bomoseen in 1982. It has since spread throughout the lake and is now well-established within the lake. The project was not for the eradication of Eurasian watermilfoil from Lake Bomoseen as that is not a feasible outcome from management actions for a well-established lake-wide population of that species.

Based on the permit application, the proposed management plan for Eurasian watermilfoil involved three consecutive years of ProcellaCOR® EC treatments beginning north of Grady Bridge and moving south to the outlet. Treatment acreages were proposed to start with 223.5 acres, followed by 188.6 acres, and finalized with 209.5 acres. This approximately 622-acre area is a part of the applicant's identified 672 acres of "manageable littoral zone." Within that area of littoral zone, the applicant's aquatic plant survey identified Eurasian watermilfoil densities as ranging from scattered to dense.

Regarding ProcellaCOR® EC as a species specific management tool, the Secretary's Lakes & Ponds Program completed a statistical analysis of pre- and post-treatment aquatic plant survey data from waterbodies that have been treated with the herbicide ProcellaCOR® EC in April 2022. From aquatic plant survey data from Vermont waterbodies, it was found that after a ProcellaCOR® EC treatment, a statistically significant decrease of the lake-wide frequency of occurrence for Eurasian watermilfoil and coontail (non-target native species) occurred. Over the same period, a statistically significant increase of the lake-wide frequency of occurrence for the beneficial native species Illinois pondweed and American eelgrass occurred. The use of a species-specific targeted herbicide to control an aquatic invasive species as a part of an integrated management strategy could be a part of a reasonable set of tools used to achieve the scope of the project.

Currently, Eurasian watermilfoil can be found throughout Lake Bomoseen and has been documented as growing up to form dense surface mats. Given the nature and growth habit of this species, even in locations where Eurasian watermilfoil growth may not currently be dense or directly impacting aquatic habitat and public good use of an area, the species has a high potential for reaching a nuisance density as it is an invasive species. Control of Eurasian watermilfoil can result in tangible short-term benefits to public good uses or prevent those uses from becoming impacted.

While there would be anticipated benefits to public good uses and the ecological integrity of Lake Bomoseen from the management of the aquatic invasive species Eurasian watermilfoil, the specifically proposed project is excessive for the stated purpose as:

I. There is not an acceptable risk to the non-target environment.

II. A long-range management plan that adequately incorporates a schedule of pesticide minimization has not been developed.

III. The degree of public benefit does not outweigh the adverse effect on the public good.

b. Standard Conditions

1. Appeals. Pursuant to 10 V.S.A. Chapter 220, an aggrieved person shall not appeal this permit unless the person submitted to the Secretary a written comment during the applicable public comment period or an oral comment at the public meeting conducted by the Secretary. Absent a determination of the Environmental judge to the contrary, an aggrieved person may only appeal issues related to the person's comments to the Secretary as prescribed by 10 V.S.A. § 8504(d)(2). Pursuant to 10 V.S.A. Chapter 220 and the Vermont Rules for Environmental Court Proceedings, any appeal of this decision must be filed with the clerk of the Environmental Division of the Superior Court within 30 days of the date of the decision. 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 Division; and must be signed by the appellant or the appellant's attorney. 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 at www.vermontjudiciary.org. The address for the Environmental Division is: 32 Cherry Street; 2nd Floor, Suite 303; Burlington, VT 05401 Telephone #: 802-951-1740.

c. Denial

By delegation from the Secretary, the Vermont Department of Environmental Conservation has made a determination that the control activity does not comply with the criteria of 10 V.S.A. § 1455 for an individual aquatic nuisance control permit for pesticide and hereby issues this decision and denial to the applicant for the above-named project.

Julia S. Moore, Secretary
Vermont Agency of Natural Resources

By: _____

Oliver Pierson, Program Manager
Lakes & Ponds Management and Protection Program
Watershed Management Division