H31/Act 57 Relating to Aquatic Nuisance Control 2023 Study Committee

Vermont Department of Environmental Conservation - Lakes and Ponds Program

October 17, 2023

VERMONT

ANC Statute Chapter 10 Section 1455 – Terminology

10 V.S.A. § 1455(d): The Secretary shall issue a permit for the use of pesticides in waters of the State for the control of nuisance aquatic plants, insects, or other aquatic life, including lamprey, when the applicant demonstrates and the Secretary finds:

- there is no reasonable nonchemical alternative available;
- there is acceptable risk to the nontarget environment;
- there is negligible risk to public health;
- a long-range management plan has been developed which incorporates a schedule of pesticide minimization; and
- 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.

10 V.S.A. § 1455(f): The Secretary shall issue a permit for the control of aquatic nuisances by biological controls, bottom barriers, structural barriers, structural controls, powered mechanical devices, or chemicals other than pesticides when the Secretary finds:

- (1) there is acceptable risk to the nontarget environment;
- (2) there is negligible risk to public health; and
- (3) there is either benefit to or no undue adverse effect upon the public good.

Determination of "Reasonable" Nonchemical Alternatives:

(1) there is no reasonable nonchemical alternative available;

a. Permit Query – "Reasonable"

1. What is the purpose and goal of the control activity? Is it part of a long-term management strategy or plan?
2. What is the history of the aquatic nuisance species being targeted for control, what is the current status of the aquatic nuisance species in those waters? Is the species an aquatic invasive species, or a native species? What is the life history of the targeted aquatic nuisance species?
3. If an invasive species is targeted for control, when was it introduced, and how widespread is the population or infestation? What is the likelihood that the species will be eradicated?
4. Is the treatment a targeted spot treatment or broad scale (whole lake) treatment?
5. What control activities have been used previously within the project area to control the aquatic nuisance? Have they been successful?
6. What management strategy is being proposed to control the aquatic nuisance and what measures will be taken to minimize the use of pesticide? A management strategy is considered the method by which specific control areas are identified for management as a means to achieve the purpose and goal of the control activity. This can include identification of an action threshold, areas of impacted public good uses, or areas of impacted aquatic habitat of a body of water.
7. What is the chemical, physical, and biological status of those waters? What is the status of the waterbody's trending nutrient (phosphorus) levels, watershed disturbance, Secchi depth, and biological productivity that is affecting the plant production as noted in the Lake Score Card?
8. What is the status of the waterbody's Vermont Inland Lake Shoreland and Habitat Score/USEPA National Lake Assessment Score ranking?
9. What nonchemical control activities are available to control the aquatic nuisance and how are those nonchemical control activities incorporated into the management strategy?
10. What is the likelihood of achieving the purpose and goal of the control activity?
11. What human activities would benefit or be impacted from the treatment? Boating, fishing, swimming?
12. What are the potential impacts to the non-target population?

Determination of "Reasonable" Nonchemical Alternatives:

b. Permit Example: 3382-ANC-C, issued 2/24/2022 – "Reasonable"

Control Activity Purpose. The purpose of the control activity is to use ProcellaCOR® EC as a part of an ongoing integrated pest management plan to manage an established population of an aquatic invasive species (Eurasian watermilfoil) to improve the public good uses of Lake Fairlee.

No Reasonable Non-Chemical Alternative Available – 10 V.S.A. 1455(d)(1). The Secretary identified a potentially reasonable approach for addressing a well-established lake-wide population of Eurasian watermilfoil. Baseline assumptions regarding the proposed control activity were made to outline a reasonable approach for controlling Eurasian watermilfoil as well as identifying ecological and water quality characteristics for this waterbody:

- The control activity proposes to target specific locations (spot treatments) of dense populations of the aquatic invasive species Eurasian watermilfoil.
- Eurasian watermilfoil has been established in Lake Fairlee since at least 1995.
- The Eurasian watermilfoil population has spread throughout the lake, is a well-established population, and eradication is a highly unlikely outcome from control efforts.
- Non-chemical control methods targeting Eurasian watermilfoil have been used in Lake Fairlee.
- ProcellaCOR® EC (active ingredient florpyrauxifen-benzyl) is expected to dissipate rapidly to a reduced concentration in Lake Fairlee due to its rapid photolysis and aerobic aquatic metabolism. The outlet of Lake Fairlee flows into an unnamed tributary of the Ompompanoosuc River. Due to its rapid degradation, it is anticipated that reduced concentrations of ProcellaCOR® EC will flow downstream until complete breakdown of the pesticide occurs.

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Determination of "Reasonable" Nonchemical Alternatives:

b. Permit Example: 3382-ANC-C, issued 2/24/2022 – "Reasonable"

- As identified in the Vermont Lake Score Card (FAIRLEE – data through 2020), Lake Fairlee's trend score is poor, its Vermont Water Quality Standards status is stressed from nutrients and phosphorus, and it has a "moderately disturbed" watershed score. Mean spring total phosphorus is 12.2 ug/L, mean summer total phosphorus is 15.6 ug/L, mean summer chlorophyll a is 4.7 ug/L, and mean summer Secchi depth is 6.1 meters. The mean spring total phosphorus concentration trend is significantly increasing; the mean summer total phosphorus concentration trend is highly significantly increasing; and the mean summer Secchi depth trend is significantly decreasing. This data supports the likelihood of the presence of elevated biological productivity within Lake Fairlee, which may result in dense aquatic plant populations, including Eurasian watermilfoil.
- As identified in the Vermont Lake Score Card, the Vermont Inland Lake Shoreland and Habitat Score/USEPA National Lake Assessment Score ranks Lake Fairlee as being in poor condition. This ranking is a measure of human activity within 15 meters of the lake's shoreline at ten (10) random sites around the lake; it reflects how extensively a lake's shoreland is developed. Those locations of significant development reduce the natural resiliency of the waterbody and increases potential adverse impacts to the biological, chemical, and physical integrity of the waterbody.

The use of a pesticide for targeted spot treatments is a reasonable approach to manage Eurasian watermilfoil in Lake Fairlee given the baseline assumptions. This management approach can target limited locations within the littoral zone where public good uses, such as boating, fishing, or swimming, are impacted by this species. This targeted spot treatment approach can be limited to specific areas to minimize potential adverse impacts on native aquatic plant species that may be sensitive to the pesticide. The Secretary will assess the proposed treatment locations targeted by a spot treatment to ensure the use of pesticide will be focused to areas of dense Eurasian watermilfoil growth only where non-chemical control methods may be unreasonable due to the size or density of the Eurasian watermilfoil population or the potential non-target impacts associated with conducting a non-chemical control activity. The Secretary has determined there is no reasonable non-chemical alternative available.

Determination of "Reasonable" Nonchemical Alternatives:

c. Definitions of the Term "Reasonable"

- Not extreme or excessive; moderate, fair. (Webster Dictionary)
- Based on or using good judgment and therefore fair and practical; acceptable. (Cambridge Dictionary)
- Fair and sensible. (Collins Dictionary)
- **Legal Definition**: Just, rational, appropriate, ordinary, or usual in the circumstances. It may refer to reasonable care, cause, compensation, doubt (in a criminal trial), and a host of other actions or activities. (Cornell Law School)

In Vermont Statute

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A definition from an existing water-related statute in Vermont, 10 V.S.A. 1002 (18) - Regulation of Stream Flow, is:

- "**Reasonable** and feasible" means available and capable of being implemented after consideration of cost, existing technology, logistics in light of the overall project purpose, environmental impact, and ability to obtain all necessary approvals for implementation.

Determination of "Reasonable" Nonchemical Alternatives:

d. Discussion Points

1. Is the existing approach DEC is using to make this determination adequate? Where is it lacking? What could be added?
2. Should there be other quantitative criteria used to determine that the proposed treatment is meeting this definition?
3. Should we include the definition as described in the (river) statute?
4. Should the applicant be required to provide answers to the twelve questions as part of their permit application which may make the application lengthier?
5. Is there some other approach we should be using to make this determination, that could be incorporated into the statute?

Potential definition for "reasonable":

A nonchemical control method that is available and capable of being implemented after consideration of cost, existing technology, logistics in light of the overall project purpose, (scope, and scale), and environmental impact.

DEC believes that reference to the project purpose is important because a control practice could be viewed as not being reasonable if it doesn't address the problem at hand.

Determination of acceptable risk to the non-target environment

(2) there is acceptable risk to the nontarget environment;

To review this condition, DEC currently identifies the non-target environment as the following:

1. Aquatic plants and animals within the waterbody proposed for treatment and waters up to one mile downstream of the waterbody.
2. Wetlands within the waterbody proposed for treatment and wetlands within the outlet waters up to one mile downstream of the waterbody.
3. Human use of waters treated with the pesticide. This includes, hydroponic farming, greenhouse and nursery plants, and all locations irrigated with waters treated with a Pesticide.
4. 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.

Determination of acceptable risk to the non-target environment

(2) there is acceptable risk to the nontarget environment;

As stated in Permit Conditions:

Within the area identified as the non-target environment, the Secretary shall make determinations on the following:

A. Effect of the control activity on aquatic plants. This assessment shall consider immediate and long-term impacts to aquatic plants, including impacts to rare, threatened, or endangered species. A determination shall be made on whether the proposed control activity poses an acceptable risk to aquatic plants and whether any mitigating actions can/should be taken to avoid and/or reduce the potential impact.

B. Effect of the control activity on aquatic animals. This assessment shall consider immediate and long-term impacts to aquatic animals, including impacts to rare, threatened, or endangered species. A determination shall be made on whether the proposed control activity poses an acceptable risk to aquatic animals and/or their habitats, and whether any mitigating actions can/should be taken to avoid and/or reduce the potential impact.

C. Effect of the control activity on wetlands. This assessment shall consider immediate and long-term impacts to wetlands that are jurisdictional to the State. A determination shall be made on whether the proposed control activity poses an acceptable risk to wetlands, and whether any mitigating actions can/should be taken to avoid and/or reduce the potential impact.

D. Effect of the control activity on human use of waters treated with the pesticide. This assessment shall consider immediate and long-term impacts to the non-target environment that may be exposed to the pesticide as a result of human use of treated waters, including potential impacts to hydroponic farming, greenhouse and nursery plants, and all locations irrigated with treated waters. A determination shall be made on whether the proposed control activity poses an acceptable risk to this non-target environment, and whether any mitigating actions can/should be taken to avoid and/or reduce the potential impact.

E. Potential cumulative effect of the control activity to the non-target environment and receiving waters. This assessment shall consider how the control activity may interact with other control activities within the receiving waters as well as the immediate and long-term impacts to the biological, chemical, and physical integrity of the receiving waters. A determination shall be made on whether the proposed control activity poses an acceptable cumulative risk to the receiving waters, and whether any mitigating actions can/should be taken to avoid and/or reduce the potential impact.

F. Final determination on whether there is an acceptable risk to the non-target environment.

Determination of acceptable risk to the non-target environment

(2) there is acceptable risk to the nontarget environment;

Permit Example: 3382-ANC-C, issued 2/24/2022 – "Acceptable Risk"

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

1. Aquatic plants and animals within the waterbody proposed for treatment and waters up to one mile downstream of the waterbody.
2. Wetlands within the waterbody proposed for treatment and wetlands within the outlet waters up to one mile downstream of the waterbody.
3. 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.
4. 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 several baseline assumptions related to the non-target environments potentially affected by the proposed treatment:

- 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 aquatic plant species have been recorded as being present in Lake Fairlee. Species observed include prickly hornwort (S2S3), Ceratophyllum echinatum; Nuttall's waterweed (S3), Elodea nuttallii; Vasey's Pondweed (S2), Potamogeton vaseyi; marsh mermaidweed (S2S3), Proserpinaca palustris; humped bladderwort (S3), Utricularia gibba; and lesser bladderwort (S3), Utricularia minor. Those species are not listed as being controlled by ProcellaCOR® EC as identified on the product label. However, Ceratophyllum echinatum is a close relative to a native non-target species that is listed as being controlled by ProcellaCOR® EC (Ceratophyllum demersum). Additionally, Proserpinaca palustris is within the same Family as Eurasian watermilfoil (Haloragaceae). Therefore, there is the potential that Ceratophyllum echinatum and Proserpinaca palustris may be negatively impacted by ProcellaCOR® EC.

Determination of acceptable risk to the non-target environment

(2) there is acceptable risk to the nontarget environment;

Permit Example: 3382-ANC-C, issued 2/24/2022 – "Acceptable Risk"

- Native aquatic plants controlled by ProcellaCOR® EC as identified on the product label have been recorded as being present in Lake Fairlee. This includes watershield, *Brasenia schreberi*, last observed in 2021 with a 6% frequency of occurrence for the 120 survey points within Lake Fairlee at various densities scattered throughout the lake; and coontail, *Ceratophyllum demersum*, last observed in 2020 with a <1% frequency of occurrence for the 120 survey points within Lake Fairlee at a trace density along the western half of the southern shoreline. In previous correspondence with the co-permittee, it was identified that season long and sometimes multi-season control of *Brasenia schreberi* can be achieved from a treatment concentration of 4 Prescription Dose Units (PDU). 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 demersu*m will most likely only be impacted at a treatment concentration of greater than 4 PDU. The applicant also identified that white water lily, *Nymphaea odorata*, and yellow water lily, *Nuphar variegata*, may also be sensitive (not controlled/sublethal) to ProcellaCOR® EC based on treatments conducted in previous years. 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. Nymphaea odorata and *Nuphar variegata* were last observed in 2021. In 2021, Nymphaea odorata population densities were observed as trace to dense and dispersed throughout the waterbody with a 10% frequency of occurrence for the survey points within Lake Fairlee. In 2021, Nuphar variegata population densities were observed as trace to moderate and dispersed throughout the waterbody with a 2% frequency of occurrence for the survey points within Lake Fairlee.
- The outlet of Lake Fairlee flows into an unnamed tributary of the Ompompanoosuc River. It is anticipated that reduced concentrations of ProcellaCOR® EC will flow downstream until complete breakdown of the pesticide occurs. The species composition within the unnamed tributary is not specifically known.

Determination of acceptable risk to the non-target environment

(2) there is acceptable risk to the nontarget environment;

Permit Example: 3382-ANC-C, issued 2/24/2022 – "Acceptable Risk"

- Mapped Class II wetlands are located at the Blood Brook inlet, the Middle Brood inlet, an unnamed inlet along the northeastern shore, and the outlet. The Middle Brook inlet was surveyed by the Secretary on 6/5/2020 for rare aquatic plant species. During that survey, dense populations of Proserpinaca palustris were observed along the shoreline of the wetland growing out to approximately 1.5 feet deep. Scattered Ceratophyllum echinatum, Elodea nuttallii, and Utricularia minor populations were also found within this wetland along with robust growth of other native aquatic plant species with trace amounts of Eurasian watermilfoil. Additional wetlands may be present as defined by a dominance (>50% surface area coverage) of woody, emergent, or floating leaved vegetation anchored in sediment located in areas up to 6.5 feet deep. Examples of wetland vegetation include willow and alder shrubs, cattails, emergent bur-reed, emergent arrowhead/Sagittaria sp., and watershield/white water lily pads/spatterdock/floating leaved pondweeds. Provided only Eurasian watermilfoil is targeted, the control activity would be an Allow Use (6.18) under the Vermont Wetland Rules.
- Lake Fairlee and its waters are public, and it is reasonable to assume that all public waters may be used for irrigation.
- 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. Review of ecotoxicity studies based on the maximum label rate of 50 parts per billion, indicates parent compound and degradates show toxicity levels are well above the application rates used in aquatic environments. 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.
- Based on a bathymetry survey completed by the Secretary on 8/22/2018, Lake Fairlee is 467.7 acres, and the littoral zone covers approximately 151.7 acres, which is 32.4% of the total lake surface area. The littoral zone is the area of the lake that supports rooted aquatic vegetation.
- Approximately 20.9 acres are proposed to be treated with ProcellaCOR® EC in 2021, which is 4.5% of the total lake surface area and 13.8% of the littoral zone of Lake Fairlee. If a treatment is proposed during a year this permit is active, the final annual treatment area will be determined annually in accordance with condition a.4. of this permit.

Determination of acceptable risk to the non-target environment

(2) there is acceptable risk to the nontarget environment;

Permit Example: 3382-ANC-C, issued 2/24/2022 – "Acceptable Risk"

The presence of aquatic vegetation is required for fish & wildlife habitat. Generally, Eurasian watermilfoil (EWM) has been identified as providing poor fish & wildlife habitat compared with native aquatic vegetation. The removal of EWM promotes native plant biodiversity, which improves the biological integrity of the lake over time. However, EWM may provide beneficial structural habitat in the absence of other aquatic vegetation. As a measure to reduce potential non-target impacts on the ecological integrity of Lake Fairlee, no more than 40% of the littoral zone may be targeted by aquatic plant management activities annually. For any requests that propose managing more than 40% of the littoral zone, including a combination of chemical and non-chemical control methods, the permittee must demonstrate a need where the potential adverse effects on the non-target environment are outweighed by the tangible benefits.

It is not anticipated that the non-target aquatic plants and animals within Lake Fairlee, the waters downstream of Lake Fairlee, or the wetlands will be adversely impacted by applying ProcellaCOR® EC in accordance with this permit and the Approved Application. The current treatment application rate is proposed to be up to 4 PDUs (maximum application rate is 25 PDUs), which is within the application rate for targeting Eurasian watermilfoil as identified in the ProcellaCOR® EC specimen label (Table 5). For aquatic plant species that are known to be controlled by ProcellaCOR® EC, aquatic plant species closely related to species controlled by ProcellaCOR® EC, or for species that may be sensitive to ProcellaCOR® EC, proposed treatments will need to be designed to avoid potential impacts to known locations of those populations.

The native non-target species that may be negatively impacted by a ProcellaCOR® EC treatment that are in Lake Fairlee *(Brasenia schreberi, Ceratophyllum demersum, Ceratophyllum echinatum, Nuphar variegata, Nymphaea odorata, and Proserpinaca palustris)* are often located within wetlands or wetland buffers. As previously observed by the Secretary on 6/5/2020, the Middle Brook inlet wetland contains all of these species. Due to this potential negative impact on native non-target aquatic plant species, a proposed ProcellaCOR® EC treatment should not exceed treatment concentrations where there is the potential for negative impacts (e.g., no greater than 2 PDU for locations with *Brasenia schreberi* or 4 PDU for locations with *Ceratophyllum demersum*) and treatment locations should avoid being within a wetland, 50 foot wetland buffer, or locations with known populations of these native non-target species, unless it can be determined that the overall lake-wide population of a sensitive species will not be significantly impacted.

Determination of acceptable risk to the non-target environment

(2) there is acceptable risk to the nontarget environment;

Permit Example: 3382-ANC-C, issued 2/24/2022 – "Acceptable Risk"

For each treatment, a pre-treatment quantitative aquatic plant survey will be completed during the year prior to a proposed treatment and a pre-treatment qualitative aquatic plant survey for Eurasian watermilfoil and the non-target native species that are controlled or sensitive to ProcellaCOR® EC will be completed during the year of a proposed treatment within the proposed treatment location(s). Following a treatment, a post-treatment quantitative aquatic plant survey will be conducted to assess how aquatic plant populations respond to control activities during the year of treatment and the year following the last treatment. Quantitative aquatic plant surveys will be completed during the aquatic plant growing season (July 1st through September 30th) and completed using the point-intercept rake-toss methodology. The Secretary will assess those surveys to ensure the acceptable risk to the non-target environment finding can continue to be met.

While there are recommended use restrictions identified on the product label for hydroponic farming, greenhouse, nursery plants, and irrigation of landscape vegetation, use restrictions are limited and will likely be temporary as ProcellaCOR® EC is expected to dissipate rapidly in Lake Fairlee due to its rapid photolysis and aerobic aquatic metabolism.

The permittee is required to submit an annual request for proposed treatment locations and may not conduct the treatment until receiving approval from the Secretary. To ensure compliance with this permit and to assess any unforeseen or unanticipated adverse impacts on the non-target environment, the findings made in this permit to authorize the use of ProcellaCOR® EC may be reviewed annually upon receiving the annual request.

The use of ProcellaCOR® EC will only occur while Eurasian watermilfoil is actively growing, which is typically between mid-June through mid-September. ProcellaCOR® EC is absorbed through submersed plant shoots and leaves when used in water. There is the potential that treatments scheduled earlier in the year may be more protective of non-target native aquatic plants as Eurasian watermilfoil often begins actively growing before non-target native aquatic plants. Targeting Eurasian watermilfoil with ProcellaCOR® EC earlier in the season may also result in requiring a reduced amount of the pesticide to be effective at controlling Eurasian watermilfoil.

As Eurasian watermilfoil biomass may be reduced earlier in the year before non-target native aquatic plants begin fully growing, the reduction of that biomass may allow for an increase in available light for non-target native aquatic plants. This may temporarily increase the competitive advantage for those non-target native aquatic plants to exist for a longer period within the treatment location before Eurasian watermilfoil recolonizes the area, thus potentially reducing the frequency of using a pesticide.

The Secretary has determined that there is an acceptable risk to the non-target environment.

Determination of "Acceptable Risk" to Nontarget Environment

c. Definitions of the Term "Acceptable"

- Capable or worthy of being accepted; barely satisfactory or adequate. (Webster Dictionary)
- Satisfactory and able to be agreed to or approved of; just good enough, but not very good. (Cambridge Dictionary)
- Acceptable activities and situations are those that most people approve of or consider to be normal (Collins Dictionary)
- **Legal Definition**: Just, rational, appropriate, ordinary, or usual in the circumstances. It may refer to reasonable care, cause, compensation, doubt (in a criminal trial), and a host of other actions or activities. (Cornell Law School)

Various Definitions of the Term "Acceptable Risk"

- **Engineering:** Acceptable risk is the level of potential losses that a society or community considers acceptable given existing social, economic, political, cultural, technical and environmental conditions. In engineering terms, acceptable risk is also used to assess and define the structural and non-structural measures that are needed in order to reduce possible harm to people, property, services and systems to a chosen tolerated level, according to codes or accepted practice; which are based on known probabilities of hazards and other factors.
- **Encyclopedia**: The term "acceptable risk" describes the likelihood of an event whose probability of occurrence is small, whose consequences are so slight, or whose benefits (perceived or real) are so great, that individuals or groups in society are willing to take or be subjected to the risk that the event might occur. The concept of acceptable risk evolved partly from the realization that absolute safety is generally an unachievable goal, and that even very low exposures to certain toxic substances may confer some level of risk. The notion of virtual safety corresponding to an acceptable level of risk emerged as a risk management objective in cases where such exposures could not be completely or cost-effectively eliminated..

Determination of "Acceptable Risk" to Nontarget Environment

d. Discussion Points

1. Is the existing approach DEC is using to make this determination adequate? Where is it lacking? What could be added?
2. Should there be other quantitative criteria used to determine that the proposed treatment is meeting this definition?
3. Should there be quantitative criteria used to define acceptable risk?

Potential definition for "acceptable risk":
Acceptable risk is the degree of actual or potential impact that the Agency considers acceptable given existing statutory requirements, environmental conditions, sociocultural considerations, and whether adverse effects on the non-target environment are outweighed by tangible benefits from carrying out the project.

4. Are there comments on how the assessment on acceptable risk is made?

- Specific aspects of the non-target environment (e.g., aquatic plants, animals, wetlands): This assessment shall consider immediate and long-term impacts to the non-target environment. A determination shall be made on whether the proposed control activity poses an acceptable risk to the non-target environment and whether any mitigating actions can/should be taken to avoid and/or reduce the potential impact.
- Cumulative assessment: This assessment shall consider how the control activity may interact with other control activities within the receiving waters as well as the immediate and long-term impacts to the biological, chemical, and physical integrity of the receiving waters. A determination shall be made on whether the proposed control activity poses an acceptable cumulative risk to the receiving waters, and whether any mitigating actions can/should be taken to avoid and/or reduce the potential impact.

Determination of "Acceptable Risk" to Nontarget Environment

d. Discussion Points

5. Is what is considered the nontarget environment adequate?

DEC currently identifies the non-target environment as the following:

1. Aquatic plants and animals within the waterbody proposed for treatment and waters up to one mile downstream of the waterbody.
2. Wetlands within the waterbody proposed for treatment and wetlands within the outlet waters up to one mile downstream of the waterbody.
3. Human use of waters treated with the pesticide. This includes, hydroponic farming, greenhouse and nursery plants, and all locations irrigated with waters treated with a Pesticide.
4. 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.

6. Are there other aspects of the non-target environment that should be included in this review?

Definition of “Acceptable Risk” to Nontarget Environment

Potential Definition of Acceptable Risk to Nontarget Environment

Acceptable risk is the degree of actual or potential impact that the Agency considers acceptable given existing statutory requirements, environmental conditions, sociocultural considerations, and whether adverse effects on the non-target environment are outweighed by tangible benefits from carrying out the project.

Determination of “Negligible” Risk to Public Health

18 V.S.A. § 2 Vermont Laws

“Public health hazard” means the potential harm to the public health by virtue of any condition or any biological, chemical, or physical agent. In determining whether a health hazard is public or private, the Commissioner shall consider at least the following factors:

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- (A) the number of persons at risk;
- (B) the characteristics of the person or persons at risk;
- (C) the characteristics of the condition or agent which is the source of potential harm;
- (D) the availability of private remedies;
- (E) the geographical area and characteristics thereof where the condition or agent which is the source of the potential harm or the receptors exist; and
- (F) Department policy as established by rule or agency procedure.

(10) “Public health risk” means the probability of experiencing a public health hazard.

(12) “Significant public health risk” means a public health risk of such magnitude that the Commissioner or a local health officer has reason to believe that it must be mitigated. The magnitude of the risk is a factor of the characteristics of the public health hazard and the degree and the circumstances of exposure to such public health hazard.

Determination of "Public Benefit" and "Public Good":

- **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.**

(3) there is either benefit to or no undue adverse effect upon the public good.

Vermont's lakes and ponds are a public trust resource managed for the benefit of all Vermonters. They are not owned by the State or any other regulatory, municipal, or private entity; rather the Agency of Natural Resources is the trustee of Vermont's surface waters. As trustees of these natural resources, the state, through the Department of Environment Conservation, has an obligation to manage the lakes and ponds of the state in a manner which preserves and protects aquatic habitat as well as aquatic biota and wildlife that may utilize or are present in the waters, a healthy environment, which preserves and protects the rights of Vermont citizens to hunt, fish, boat, swim and enjoy other recreational opportunities, and which provides the greatest benefit to the people of the state.

In the context of the Secretary reviewing an Aquatic Nuisance Control permit application, public benefit means that the proposed control activity is anticipated to have positive effects (or to reduce negative effects) on the public good that outweigh 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.

As a determination on the absence or presence of public benefit from a control activity requires a certain degree of subjective judgment, the Secretary has developed a series of considerations to help 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.

Determination of "Public Benefit" and "Public Good":

- **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.**

(3) there is either benefit to or no undue adverse effect upon the public good.

a. Permit Query – "Public Benefit" and "Public Good"

To identify whether there is a public benefit from the proposed control activity, the Secretary will consider the following:

1. Whether the control activity is excessive for its stated purpose. This includes:
   A. An assessment of the targeted aquatic nuisance and how the targeted aquatic nuisance affects the recreational potential and aquatic habitat of the body of water.
   B. An assessment of the proposed control activity (e.g., scale and scope of the project) and whether:
      i. The control activity is a reasonable technical solution to address adverse impacts from the documented aquatic nuisance issue.
      ii. The control activity is in response to a new introduction of a non-native aquatic invasive species.
      iii. The control activity is a continuation of a previously implemented aquatic nuisance control management strategy.
      iv. The control activity supports a broader aquatic nuisance management strategy for the body of water in question or a region of the state.
      v. The public benefits from controlling the aquatic nuisance outweigh the adverse effect of the proposed control activity.
2. Whether there is a feasible alternative to achieve the stated purpose of the control activity that is less intrusive. This includes:
   A. An assessment of aquatic nuisance management options, including 1) no action, 2) prevention, 3) mechanical or physical methods, 4) cultural methods, 5) biological control agents, and 6) pesticides.
3. Whether measures to reduce impacts on the body of water have been taken. This includes:
   A. An assessment of how targeted the control activity is at controlling the aquatic nuisance.
   B. An assessment of how the project has been designed to avoid and/or reduce potential immediate and cumulative impacts on the non-target environment and public good uses (e.g., implementation of this project will be coordinated with other active aquatic nuisance management projects in the body of water , control locations are prioritized to areas of impacted public good uses or shoreline development, control locations will avoid known locations of rare, threatened, or endangered species).

Determination of "Public Benefit" and "Public Good":

- **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.**

(3) there is either benefit to or no undue adverse effect upon the public good.

a. Permit Query – "Public Benefit" and "Public Good" *(continued)*

4. What the degree of public benefit is. This includes consideration of:
   A. The anticipated degree of short- and long-term effects on the recreational potential (i.e., public good uses) and aquatic habitat of the body of water should the proposed control activity be successfully implemented or if it did not occur.
   B. The consistency with any federal, state, or municipal plan.
   C. Public accessibility to the body of water and the use of those waters by persons outside the municipality in which the watersare located.
   D. The importance to commercial, agricultural, or other interests.
   E. The degree of local interest, as manifested by municipal input or other contributions to the project.
   F. Other considerations affecting feasibility, probability of achieving long-term control, and necessity or advantage of the proposed control activity.
   G. The extent to which the control activity is a developmental rather than a maintenance program.
   H. The extent to which the control activity may affect the public that utilizes those waters (i.e., impacts on the operation ofpublic infrastructure or other encroachments, impacts on drinking water, and whether the control activity would result in water use restrictions).
   I. Whether there are impacts on the recreational potential (i.e., public good uses) and aquatic habitat of waters beyond the project area.
5. The Secretary will make a cumulative assessment of the previous findings to determine whether the proposed control activity provides a public benefit that outweighs negative impacts. If the proposed control activity does not provide enough of a public benefit that outweighs negative impacts, this finding cannot be made, and the application will be denied.

Determination of "Public Benefit" and "Public Good":

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(3) there is either benefit to or no undue adverse effect upon the public good.

a. Permit Example: 3382-ANC-C, issued 2/24/2022 – "Public Benefit"

9. Public Benefit – 10 V.S.A. 1455(d)(5). The Secretary considered the following criteria in determining whether there is a public benefit to be achieved from the application of the pesticide:

- 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: Tangible 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 will 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. To reduce the potential impact to fishing as a result of impacts to fish and wildlife habitat from aquatic plant management, no more than 40% of the littoral zone may be targeted by aquatic plant management activities.

Determination of "Public Benefit" and "Public Good":

- **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.**

(3) there is either benefit to or no undue adverse effect upon the public good.

a. Permit Example: 3382-ANC-C, issued 2/24/2022 – "Public Benefit"

9. Public Benefit – 10 V.S.A. 1455(d)(5). The Secretary considered the following criteria in determining whether there is a public benefit to be achieved from the application of the pesticide: *(Continued)*

- 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 vegetation. To reduce the potential impact to fishing as a result of impacts to fish and wildlife habitat from aquatic plant management, no more than 40% of the littoral zone may be targeted by aquatic plant management activities. 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 are not anticipated to affect the water resource and the public that utilizes that resource.
    - On the day of treatment, no use of the treated waterbody and associated outlet stream for up to one mile downstream is recommended for any purpose, including swimming, boating, fishing, irrigation, and all domestic uses. Potable water will be supplied by the permittee 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, it is anticipated that all treated Eurasian watermilfoil will be controlled and no longer present within a treatment area. It is recommended to not compost aquatic plant material from the 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. Treatment concentration monitoring will occur to assess concentrations of ProcellaCOR® EC (active ingredient florpyrauxifen-benzyl) within Lake Fairlee and waters downstream to inform the public when the herbicide is no longer detectable and when potential irrigation restrictions no longer apply. 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 in Lake Fairlee and waters downstream due to its rapid photolysis and aerobic aquatic metabolism.

Determination of "Public Benefit" and "Public Good":

- **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.**

(3) there is either benefit to or no undue adverse effect upon the public good.

a. Permit Example: 3382-ANC-C, issued 2/24/2022 – "Public Benefit"

9. Public Benefit – 10 V.S.A. 1455(d)(5). The Secretary considered the following criteria in determining whether there is a public benefit to be achieved from the application of the pesticide: *(Continued)*

- Lake Fairlee 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. 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 may be targeted by aquatic plant management activities.
- 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. To reduce this potential impact, treatment locations within the littoral zone will be limited so that no more than 40% of the littoral zone is targeted annually for aquatic plant management activities.
- Lake Fairlee is not located within a Groundwater Source Protection Area or a Surface Water Source Protection Area. It is anticipated that there will be no impact on Surface Water or Groundwater Source Protection Areas.
- There is no Vermont State Park located along the shores of Lake Fairlee. Water use advisories and recommendations will not impact the operations of a Vermont State Park.

Determination of "Public Benefit" and "Public Good":

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(3) there is either benefit to or no undue adverse effect upon the public good.

a. Permit Example: 3382-ANC-C, issued 2/24/2022 – "Public Benefit"

9. Public Benefit – 10 V.S.A. 1455(d)(5). The Secretary considered the following criteria in determining whether there is a public benefit to be achieved from the application of the pesticide: *(Continued)*

- Whether measures to reduce impacts on the water resource have been taken.
  - Assessment: The control activity proposed to control Eurasian watermilfoil only, which is an aquatic invasive species. The target concentration of ProcellaCOR® EC used will be in accordance with the PDUs per acre-foot of water for Eurasian watermilfoil as identified in the specimen label (Table 5). Treatment locations should avoid wetlands, wetland buffer, or 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 determined that the overall lake-wide population of the native non-target species in question will not be significantly impacted. The treatment is proposed to be a spot treatment with relatively short exposure times (hours to several days). Treatments will occur during a time of year with actively growing Eurasian watermilfoil. To prevent resistance to ProcellaCOR® EC, the same treatment area will not be targeted for more than two consecutive years with ProcellaCOR® EC. The permittee is required to submit an annual request for proposed treatment locations and may not conduct the treatment until receiving approval from the Secretary. To ensure compliance with this permit and to assess any unforeseen or unanticipated adverse impacts on the resource or public good that may have resulted from a treatment, the findings made in this permit to authorize the use of ProcellaCOR® EC may be reviewed annually upon receiving the annual request.
- Whether the control activity is excessive for the stated purpose.
  - Assessment: The use of ProcellaCOR® EC, a spot treatment herbicide with relatively short exposure times, as a part of an ongoing integrated pest management plan to manage an established population of an aquatic invasive species (Eurasian watermilfoil) to improve the public good uses of Lake Fairlee is not considered excessive for the stated purpose.

Based upon review of the public good criteria, the Secretary has determined that the tangible benefits to the public good outweigh the potential negative impacts. The Secretary finds that there is a public benefit to be achieved from the application of a pesticide.

Determination of "Public Benefit" and "Public Good":

c. Definitions of the Term "Public Good"

Public Good Determination Procedure Under Lake Encroachment Permitting

The following text is derived from the Public Good Determination Document used for Lake Encroachment Permitting in Vermont.

Section 1. Purpose

These procedures have been adopted in order to provide guidance to the Department of Environment Conservation in the permitting of encroachments in Vermont's lakes and ponds under the authority of 29 V.S.A. Chapter 11 (Management of Lakes and Ponds). The Lakes and Ponds statute recognizes that the lakes and ponds of the state and the lands lying thereunder are held in trust by the state for the benefit of the people of the state. This basic concept is referred to as the Public Trust Doctrine. As trustees of these natural resources, the state, through the Department of Environment Conservation, has an obligation to manage the lakes and ponds of the state in a manner which preserves and protects a healthy environment, which preserves and protects the rights of Vermont citizens to hunt, fish, boat, swim and enjoy other recreational opportunities, and which provides the greatest benefit to the people of the state.

The state, as trustee, cannot sell or otherwise convey these public resources to private persons for purely private purposes. It can, however, allow the construction of docks, marinas, boathouses, retaining walls, etc. in public waters so long as the project involved is not in conflict with the public trust doctrine and does not adversely affect the public good. While the Lakes and Ponds statute provides general guidance to the Department on how to determine if a particular project is in the public good, it does not provide guidance on how to determine whether a project is in conflict with the public trust doctrine. Therefore, these procedures have been adopted to provide both guidance to the Department and notice to the public of how projects which encroach into the lakes and ponds of the state will be evaluated.

Determination of “Public Benefit” and “Public Good”:

c. Definitions of the Term “Public Good”

The public good determination should include a determination on whether the targeted species is an aquatic nuisance. This could inform the question of whether the project is excessive for the stated purpose.

Should we consider establishing a list of species that are considered an aquatic nuisance?
Similar to the list of species that are listed as a Class A or Class B Noxious Weed. We should also consider establishing a procedure for determining whether a species is an aquatic nuisance if something isn’t already on a defined list. This might help continue to draw a line between nuisance and non-target species.

All invasive fish species listed…. Shall be considered an aquatic nuisance?

Determination of “Public Benefit” and “Public Good”:

d. Discussion Points

1. Is the existing approach DEC is using to make this determination adequate? Where is it lacking? What could be added?
2. Should there be other quantitative criteria used to determine that the proposed treatment is meeting this definition?
3. Should the applicant be required to provide answers to the twelve questions as part of their permit application which may make the application lengthier?
4. Is there some other approach we should be using to make this determination, that could be incorporated into the statute?

Potential definition for “Public Benefit” and “Public Good”?