

**Permit Applicant Guide  
for Private Land: Controlling  
Mosquito Larvae for Prevention  
and/or Control of West Nile Virus**

**May, 2011**

**Permit Applicant Guide for Private Land:**  
Controlling Mosquito Larvae for Prevention and/or Control of West Nile  
Virus

**May, 2011**

**Copyright: Queen's Printer for Ontario, 2011**

**This publication may be reproduced for non-commercial  
purposes with appropriate attribution**

**PIBS 6192e**

<b>Table of Contents</b>	<b>Page No.</b>
1.0 Introduction	4
2.0 Mosquitoes as Vectors of West Nile Virus (WNV)	5
3.0 Pesticide Regulations	6
4.0 Private Land WNV Prevention and/or Control Programs	7
4.1 Surveillance	8
4.2 Licensing Requirements and Technicians	8
4.3 Permit Submission	9
A. Catch basins/storm drains	
B. Ditches and Temporary Pools or Permanent Pools including storm water management ponds	
C. Sensitive Areas	
D. Sewage and sludge storage lagoons	
4.4 Permit Submission Checklist	10
4.5 Summary Report Requirements	12
5.0 MOE Permit Requirements for Monitoring	13
A. Catch basins/storm drains	
B. Ditches and Temporary Pools or Permanent Pools including storm water management ponds	
C. Sensitive Areas	
D. Sewage and sludge storage lagoons	
6.0 MOE Recommendations for Monitoring	14
A. Catch basins/storm drains	
B. Ditches and Temporary Pools or Permanent Pools including storm water management ponds	
C. Sensitive Areas	
D. Sewage and sludge storage lagoons	
7.0 Permit Conditions	15
Table 1 Ontario Ministry of Environment Regional Pesticides Specialists/Other Contacts	16
Table 2 Ontario Ministry of Natural Resources Contact List	18
Appendix 1 - Permit Application Forms	20
Appendix 2 - Public Notification of a Water Extermination for the Control of Immature Stages of Mosquitoes (Larviciding Programs for West Nile Virus) Private Land Programs	21
Appendix 3 - Larvicides for Use in Ontario under permit for WNV	23
Appendix 4- Templates	24
Appendix 5 - Guidance for <i>Bti</i> and <i>B. sphaericus</i> Efficacy Monitoring	27
Appendix 6 - Guidance for Methoprene Efficacy Monitoring	29
Appendix 7 - Sensitive Areas Definitions	31
Appendix 8 - Assessing Catch Basins to Determine Application Rate for Methoprene Pellets	32
Appendix 9 - Submitting Maps/Geo-spatial Information for Private Land Mosquito Control Programs	33
Appendix 10 - Sensitive Areas and Species Protocol	34
Appendix 11 - Summary Report Templates	37

## **1.0 Introduction**

This permit applicant guide outlines the requirements for submitting a permit (see **Appendix 1**) to use a pesticide (i.e., larvicide to control mosquito larvae) for the prevention or control of West Nile Virus (WNV) on private land when supported by the local Medical Officer of Health (MOH). Private land includes but is not limited to:

- shopping centres
- schools and school boards
- apartment complexes, condominiums, townhouse complexes
- residential, farm, commercial and industrial properties
- recreational lands (e.g., conservation authorities, zoos, amusement parks etc.);
- Crown Land and associated properties
- utility company right of ways, rail lines or road ways
- other private land that is not included in a municipal or Health Unit WNV program.

Public notification requirements for WNV larvicide programs are included in this guide (see **Appendix 2**).

**NOTE: This guide does not include mosquito larvicide programs intended for nuisance control or procedures for persons who are exempt from an exterminator's licence and a use permit for the purchase of a pesticide for use in a water extermination.**

Ontario Regulation 63/09 under the *Pesticides Act* requires:

- a person to obtain a permit approved by the Director under the Act, authorizing that person to apply a pesticide to a water body to control a pest (referred to as a water extermination).
- a licensed exterminator holding a Mosquito/Biting Flies or Aerial licence to obtain a permit approved by the Director under the Act, authorizing that exterminator to apply a pesticide to a water body.

Any person who owns land, is the occupant or is a full-time employee of the land owner or occupant is not required to obtain a permit to use a larvicide in a water body located on the land if the water body is wholly located within the boundaries of his or her land and has no direct or indirect outflow, other than by percolation, beyond his or her land boundary. This permit exemption does not include catch basins (since they drain off of the land to municipal storm drain systems) or road side ditches (unless the land owner is responsible for the ditch and it has no flowing water). Note: if the larvicide is a Class 3 product (see **Appendix 3**) the person, if not the holder of a Mosquito/Biting Flies licence, will not be able to purchase the larvicide unless he or she obtains a letter from the Director under the Act (ss. 98(2)5 of O. Reg. 63/09).

Completed permit application forms and support documentation must be submitted to the Regional Pesticides Specialist (**See Table 1 for office locations**) responsible for the county in which the pesticide application will take place.

## **2.0 Mosquitoes as Vectors of West Nile Virus (WNV)**

The risk assessment made to determine whether or not WNV may impact people is based on numerous factors. Mosquito species identification and their numbers are part of this risk assessment and will determine the location and timing of larvicide applications, in order to disrupt the transmission cycle of WNV.

*Culex pipiens* and *Cx. restuans* are two mosquito species that feed predominately on birds but will occasionally bite humans and other mammals. *Culex* mosquitoes over-winter as adult females and possibly over-winter infected with WNV. It is also possible that migratory birds also return to Ontario infected with the virus. In early spring, the pre-mated *Culex* females that have survived the winter (mortality rate is high) disperse from over-wintering sites in sewers, outbuildings, subterranean enclosures and basements to feed on the blood of birds (especially nestlings). *Culex* mosquitoes feed mainly after sunset and before dawn.

In Southern Ontario, *Cx. pipiens* and *Cx. restuans* are known to be the species of importance in maintaining and amplifying WNV in the bird population. After feeding on the blood of birds, female *Culex* deposit their eggs in containers, catch basins, grassy roadside ditches, tire ruts, rain barrels, swimming pool covers, stored boats or other containers that hold stagnant water. A favourable breeding site in early spring for *Culex* mosquitoes is inside cups, pop cans, plastic bottles, plastic bags, abandoned tires and other litter. *Cx. restuans* females emerge earlier than *Cx. pipiens* and the discarded containers that hold snow melt waters and spring rains provide an attractive incubated breeding site. Discarded litter should be collected and properly disposed of in early spring to reduce potential breeding sites.

Several overlapping generations of *Cx. pipiens* or *Cx. restuans* may be present from April to August depending on temperature and breeding site abundance. The majority of adult *Culex* females that develop in mid to late August do not blood feed before mating and seeking over-wintering sites (winter diapause). *Culex* females that develop from mid-summer broods may take numerous blood meals from WNV infected birds and when biting mammals infect the mammals with the virus.

WNV appears to be lethal to many birds in the family Corvidae (e.g., American crows, ravens and jays) and the presence of WNV-positive dead birds is often the first sign that WNV is present and spreading through the local bird population (known as enzootic amplification). *Cx. restuans* is likely the key enzootic species involved in the early season amplification of WNV in the bird population. Urban sparrow, robin and starling populations may be potential reservoirs for WNV. Later in the season *Cx. pipiens* is the predominant species breeding in stagnant water in catch basins, surface water and containers. WNV may spill over from the bird population to humans if *Cx. pipiens* feed on the blood of a WNV infected bird and then bite people.

Controlling *Culex* mosquitoes in the early spring in surface waters to reduce the amplification of WNV in the bird/mosquito cycle and throughout the summer in catch basins to prevent the spill over of WNV to human populations should be considered as part of an integrated mosquito management program.

**The use of larvicides should be considered as part of an integrated mosquito management program that includes:**

- public education and awareness campaigns that promote personal protection
- mosquito breeding site reduction on private and public land
- removal and proper disposal of discarded tires and other containers that hold stagnant water, and
- monitoring and surveillance programs

Larviciding programs targeting *Culex spp.* should be considered, based upon a local risk assessment, through early spring to mid summer in stagnant surface water bodies such as ditches and in early spring to late summer in catch basins to greatly reduce mosquito larvae development.

Larviciding should be targeted to those catch basins that have high organic content due to a close proximity of trees or lawns which may contribute leaves and grass clippings. In general, catch basins located along major roadways and in parking lots do not have high organic content and therefore mosquito larvae are likely to be in lower numbers.

Other species of mosquitoes that are predominant in summer months, such as *Aedes vexans*, *Coquillettidia perturbans* and less common species such as *Culex salinarius*, *Ochlerotatus trivittatus*, *Och. triseriatus*, *Och. stimulans*, *Anopholes punctipennis* and *An. walkeri* may act as bridge vectors transmitting WNV from infected birds to humans. *A. vexans* breeds predominately in temporary pools created by rainfall (e.g., roadside ditches, flooded pastures) and adults are present from May to first hard frost. *C. perturbans* has one generation per year and breeds in cattail marshes. *Cx. tarsalis*, which is the primary enzootic species of WNV in western Canada, has been found in Northern Ontario and parts of Southern Ontario. *Ochlerotatus japonicus*, a potential bridge vector species, has also been tested positive for WNV in southwest Ontario.

If adult mosquito trap surveillance indicates that bridge vectors have a high rate of virus infection then it may be necessary to initiate larviciding programs to target these specific species. Larviciding through late spring to early fall of temporary pools created by rainfall will control *A. vexans* larvae from developing into adult mosquitoes. This should lower the risk of humans developing WNV from summer biting mosquitoes. The control of *C. perturbans* in cattail marshes is very difficult. The larvae do not surface feed but attach to hollow cattails to breathe and filter feed below the surface therefore the larvicide often does not contact the larvae.

### **3.0 Pesticide Regulations**

The management of pesticides is a joint responsibility of the federal and provincial governments. Health Canada's Pest Management Regulatory Agency (PMRA) is responsible for assessing pesticides to determine if they are acceptable in terms of safety, merit and value. Pesticides approved by PMRA are granted registration which allows them to be sold and used in Canada.

The Ministry of the Environment (MOE) regulates the sale, use, transportation, storage and disposal of federally registered pesticides in Ontario under the *Pesticides Act* and Ontario Regulation 63/09. There are 11 classes of pesticides in Ontario Regulation 63/09 and these, the pesticide product information system database, the Act and the Regulation are available on the

Ministry of the Environment web site at <http://www.ene.gov.on.ca/en/land/pesticides/index.php>. The class determines who can sell or use the pesticide product and what restrictions (e.g., requires a licence and/or permit) are placed on its use. **Appendix 3** provides a list of currently classified larvicides for use under permit for WNV in Ontario.

#### **4.0 Private Land WNV Prevention and/or Control Programs**

Owners of private land (e.g., shopping centres, school boards, apartment complexes, residential, farm, commercial and industrial properties, utility company right of ways, rail lines etc.) or managers of recreational lands (e.g., conservation authorities, zoos, amusement parks etc.) or administrators of Crown Land (e.g., Management Board Secretariat, Ministry of Natural Resources, Ministry of Transportation, Ontario Realty Corporation, Hydro One, federal agencies etc.) may conduct a larviciding program in water bodies located on land they own or manage if authorized by the local MOH.

A mosquito control program would likely be initiated to support and compliment a municipal or Health Unit program that is authorized by a local MOH or is ordered under Section 13 of the *Health Protection and Promotion Act (HPPA)* in an urban area. A permit application that is authorized by a health hazard order, issued by the local MOH, will be considered as a very high priority by MOE.

**NOTE:** Catch basins located on private land normally drain into a public storm drain system and therefore written authorization must be obtained from the proper jurisdiction (e.g., town, city or municipality) and accompany any permit application in order to use a larvicide in a catch basin. Ditches in front of private land abutting public roads are considered easements and are the property of the town, city or municipality and written authorization to apply a larvicide into these surface water bodies must also accompany a permit application form. See **Section 4.4**.

A permit application form may be submitted by:

- a licensed exterminator contracted by a private land owner
- a private land owner who holds an appropriate exterminator's licence
- a full-time employee, who holds an appropriate exterminator's licence, of a private land owner.

The written authorization **or** a *HPPA* health hazard order from the local MOH must accompany the permit application form. Please note that this authorization may have the following conditions:

- Application of larvicide to water bodies on private land can occur only if the water body cannot be drained or modified (i.e., cost prohibitive or water body is a sensitive area).
- The licensed exterminator must provide in writing a copy of all permits. The information submitted must identify clearly the addresses of the private lands and the type of water bodies intended to be treated with a mosquito larvicide before the larviciding program begins.
- Copies of the year end reports (summary reports) submitted to the MOE, when completed, for all permits issued must also be submitted to the Health Unit.

MOE encourages early submission (e.g., early April) of completed permit application forms and supporting documentation. Submissions will be reviewed and considered for approval subject to site-specific terms and conditions.

Applicants may “combine” treatment sites under a single permit. For example, if a licensed exterminator has contracted a school board within a Health Unit to apply larvicide to catch basins on 23 schools and larvicide to 5 ponds located at 5 schools then two permit applications must be submitted - Form 1866 for all catch basins on the school board land and Form 1867 to include the 5 ponds. For condominium complexes, several properties may be bundled under one permit application provided they are all located within the same Health Unit.

#### **4.1 Surveillance**

Dead bird surveillance, adult mosquito trapping, larvae surveys and mapping have been very important tools for determining the need for larviciding programs. Municipalities and Health Units are encouraged to conduct surveillance and monitoring programs. Dead bird surveillance has been discontinued in Ontario. If not already carried out in the previous year, municipalities and Health Units should begin in early spring to conduct human surveillance and larvae monitoring to determine if a larviciding program is warranted. Adult mosquito surveillance should also be conducted starting in mid-June.

#### **4.2 Licensing Requirements and Technicians**

A pest management company requires an Operator’s licence in order to run a business that uses pesticides to control pests. A pest management company that provides a service to control mosquito larvae is conducting a water extermination. This requires at least \$1 million in third-party liability insurance and other insurance requirements prescribed in Ontario Regulation 63/09. In addition, the company must ensure that its insurance policy allows for the use of pesticides in water (i.e., the policy has no exclusion for water exterminations). An Operator must hire appropriately licensed exterminators to carry out the larviciding program.

Private land owners that intend to use a larvicide in a water body located on their land are not required to obtain an Operator’s licence if their full-time employees are appropriately licensed and apply the larvicide.

A WNV larviciding program must be conducted by an appropriately licensed exterminator holding one of the following valid licenses:

- *Mosquito/Biting Flies* for ground equipment application of a larvicide
- *Aerial* for aircraft application of a larvicide

An appropriately licensed exterminator may indirectly supervise (i.e., visit the extermination site at least once per week) up to 7 technicians. See s. 46 of Ontario Regulation 63/09 under the *Pesticides Act* regarding the restrictions on the use of pesticides by persons supervised by a licensed exterminator.



### **4.3 Permit Application Submission**

Private land owners may decide to submit a permit application in order to conduct larviciding programs based upon scientific/health related data such as real time mosquito surveillance activities or past year's surveillance data.

**MOE will only consider the use of larvicides containing methoprene, *Bacillus thuringiensis* var. *israelensis* (*Bti*) or *Bacillus sphaericus* (*B. sphaericus*) under permit for the control of WNV.**

Permit application forms and support documents for larviciding should be submitted **separately** for any of the following four types of larviciding programs:

#### **A. Catch basins/storm drains:**

- Methoprene and *B. sphaericus* products will be considered for application to catch basins/storm drains since these are high in organic content and suspended silt and it is unlikely that non-target aquatic organisms will be present (Note: *Bti* has limited efficacy in water bodies with high organic and silt content).
- Label rate for methoprene pellets is 0.7 g per catch basin (equivalent to a broadcast application rate of 11.2 kg/ha in water with a high organic matter content) based on an average surface water area of 0.6 m<sup>2</sup>. Catch basins with an average surface water area greater than 0.6 m<sup>2</sup> would receive proportionately more of the methoprene pellets. Label rate for methoprene ingots is one ingot (briquet) per catch basin (Note: ingots are registered for use only in catch basins). Label rate for *B. sphaericus* water soluble pouches allows one 10g pouch per catch basin.
- A greater amount of methoprene pellets per catch basin is consistent with label directions if drainage from the catch basin is impeded and the water in the catch basin is backed up, above the level of the outlet pipe, allowing standing water in the storm sewer drain. This would be determined by a pre-treatment inspection (see **Appendix 8**). A review of best practices indicates that an amount of up to 3.5 g of methoprene pellets may be applied in such situations and is consistent with label directions.
- See **Appendix 8** for detailed information on determining application rates.

#### **B. Ditches and Temporary Pools or Permanent Pools including storm water management ponds**

- Methoprene, *Bti* and *B. sphaericus* products will be considered for application in ditches and temporary pools or permanent pools including storm water management ponds. Product selection should be considered if these water bodies support non-target aquatic organisms (*Bti* and *B. sphaericus* are very specific to mosquito larvae and only have a minimal impact on other aquatic fly larvae).
- The rate of application will be determined by the larval instar stage, target species etc. as indicated on product labels.

**C. Sensitive Areas - Wetlands, Critical Fish Habitat, Fish Sanctuary, Endangered and Threatened Species Habitat:** Permit applications for Sensitive areas (see **Appendix 7**) will be reviewed according to the Sensitive Areas and Species Protocol developed cooperatively between the Ministry of Natural Resources and other environmental agencies (see **Appendix 10**).

- *Bti* and *B. sphaericus* products will be considered for use in Sensitive areas since these water bodies often support non-target aquatic organisms (*Bti* and *B. sphaericus* are very specific to mosquito larvae and only have a minimal impact on other aquatic dipterans).
- The rate of application will be determined by the larval instar stage, target species, etc., as indicated on *Bti* and *B. sphaericus* product labels.

#### **D. Sewage and sludge storage lagoons**

- Methoprene and *B. sphaericus* products will be considered for application in sewage and sludge lagoons since these water bodies are high in organic content and it is unlikely that non-target aquatic organisms will be present (Note: *Bti* has limited efficacy in water bodies with high organic content).
- A label rate for methoprene products of 11.2 kg/ha for broadcast application of pellets and 22.4 kg/ha of granules is in accordance with label directions for water with a high organic content. A rate of 5.6 to 16.8 kg of product per hectare (0.56 - 1.68 g of product per square metre) of water surface area is in accordance with label directions of *B. sphaericus* products (see **Appendix 6** for determining organic content of water bodies).

### **4.4 Permit Submission Checklist**

#### **Previous Applicants:**

Applicants who:

- obtained an approved permit since 2003 for a mosquito larvae control program for WNV and provided MOE with hard copy maps/electronic maps and/or digital mapping coordinates; **and**
- are applying for a permit to conduct a mosquito control program for WNV with minor changes to the proposed treatment area information must provide items 1, 2, 3, 4, 5, 7, 8 and 9 below. Minor changes (additional or reduced treatment areas must be identified by describing the geographic area in the submission).

You are not required to resubmit maps (item 6 below) with your permit application submission, however, maps will be required with your summary report.

#### **New Applicants:**

A new application for a permit to use a larvicide for the control of mosquito larvae as a preventative or control action against WNV **must** include the following information as support documentation:

1. A completed permit application form (see **Appendix 1**). Use permit application Form 1866 when applying for approval to use a larvicide in **catch basins** and Form 1867 when applying for approval to use a larvicide in **surface water bodies**.
2. Proof of insurance coverage indicating that your policy allows for a water extermination.

3. A copy of an order under the *Health Protection and Promotion Act* (see **Appendix 4 - Template 1** or a letter of authorization for larviciding on public and private lands from the local MOH (see **Appendix 4 - Template 2**) indicating:
  - A mosquito larviciding program is considered necessary or appropriate to reduce *Culex restuans* or *Cx. pipiens* larvae and prevent the enzootic amplification of WNV, based upon current data or data obtained from the previous year's WNV-positive dead bird and/or mosquito surveillance programs in that jurisdiction or a neighbouring jurisdiction **and/or**
  - A mosquito larviciding program is considered necessary to reduce *Cx. pipiens*, *Aedes vexans* or other mosquito species that may act as a bridge vector species for WNV from birds to humans based on data obtained from the current year's WNV-positive dead bird/animal/human and/or mosquito surveillance programs.

**NOTE:** A copy of a *HPPA* order or authorization letter from the MOH may be already on file with the MOE. Contact the Pesticide Specialist to determine if this is the case (see **Table 1**).

4. A written statement from an official representative of a town, city, municipality, etc., within the jurisdiction where the private land is located, authorizing the use of a larvicide into surface water, catch basins, storm drains or ditches that are owned by the town, city, municipality etc. but are located on the private land. See **Appendix 4 - Template 3**.  
**NOTE:** This written statement is not required if an order is issued under the *Health Protection and Promotion Act*.
5. A written statement from the private land owner/manager authorizing the use of a larvicide. See **Appendix 4 - Template 4**. **NOTE:** This written statement is not required if an order is issued under the *Health Protection and Promotion Act* (e.g. to an uncooperative or absentee land owner).
6. Map(s) of the treatment site. Submissions of electronic maps and/or digital mapping data are strongly encouraged. If available, please provide digital mapping data to the Regional Pesticides Specialist who will use your electronic information to generate maps for MOE purposes (depending on location within Ontario). Digital mapping coordinates and street addresses should be submitted as detailed in **Appendix 9**.

The minimum requirements for map elements for any type of larvicide program are as follows:

- map scale 1:25,000
- identification of **all** Sensitive areas (see **Appendix 7** for definitions) including wetlands.

Mapping information for catch basins must include the:

- approximate boundaries of the treatment area(s) / storm sewer shed
- approximate number and approximate area of catch basins proposed for the treatment area / storm sewer shed (for schools, condominiums and other small private land sites exact locations must be provided)
- location of discharge points/outflows if catch basins are located at or near a Sensitive area\* (consult with the local municipality for this information - if not available, obtain a

letter from the municipality stating that catch basin discharge points/outflows are not currently available and include this letter with the support documentation).

Mapping information for ditches, temporary and permanent pools, storm water retention ponds and Sensitive areas\* must include the:

- approximate boundaries of the treatment area(s)
- location of discharge points/outflows if the surface water treated is located at or near a Sensitive area (consult with the local municipality for this information - if not available, obtain a letter from the municipality stating that surface water discharge points/outflows are not currently available and include this letter with the support documentation)
- estimated total area (in hectares) proposed for treatment

\* Permit Applications for Sensitive areas must follow the protocol for a Sensitive Areas and Species (See **Appendix 10**)

For private land programs a second map detailing the site must be submitted with the permit application that includes the location of the land in relation to major intersections. This map may be a site blue print or drawing but must contain orientation (N, S, E, W), and all buildings, parking areas and Sensitive areas including:

- any creeks, streams, rivers, lakes that run through or border the land as well as any storm sewer out flows into these areas
- designation of bordering lands e.g. industrial factory, ravine, commercial business etc.

If digital mapping coordinates are submitted rather than maps, a statement regarding discharge and/or outflow must accompany the permit application.

7. A description of measures that will be used to protect Sensitive areas from potential impact due to possible movement of the larvicide from the target area.
8. A description of the measures that will be used to identify which catch basins have been treated with a larvicide including the number of treatments per catch basin and which ones must not be treated with a larvicide.
9. Monitoring data is required for some types of larviciding programs. If monitoring is required for your program, a textual description of the methods that will be used to comply with the MOE requirements must be included. If unsure, see Section 5.0 below for **required** pre and post larviciding monitoring data and Section 6.0 for **recommended** monitoring procedures.

#### **4.5 Summary Report Requirements**

MOE approved permit conditions will require that a summary report be submitted by December 1<sup>st</sup> identifying the location(s) where larviciding treatments occurred. See **Appendix 11** for summary report templates and information regarding all other submission requirements. **Note:** It is not necessary to use the exact format provided in these summary report templates, however, all of the information indicated in these templates must be provided. The MOE strongly

encourages that all information submitted on the actual locations and/or areas of larvicide use be submitted in electronic format including digital mapping coordinates (see **Appendix 9**).

**Larvae Monitoring Forms:** Completed pre and post larviciding monitoring forms (see **Appendix 5**) for Sensitive areas and pre larviciding monitoring forms for ditches and temporary or permanent pools (including storm water management ponds) must be retained by the permit holder for a period of two years and be readily available upon request by the MOE. See section **5.0** below for MOE requirements. See **Appendix 11** for the summary information that must be provided on pre and post larviciding monitoring.

## **5.0 MOE Permit Requirements for Monitoring**

The methods that will be used to comply with the MOE requirements listed below **must be included** with the permit application support documentation.

### **A. Catch basins/storm drains using methoprene:**

- No monitoring requirements if methoprene is used (see Section **6.0** below for monitoring recommendations). MOE **requires** that pre-larviciding monitoring be conducted if *B. sphaericus* is used since label directions indicate that catch basins should be sampled to determine that mosquito larval are present. MOE suggests that 10% of the catch basins (to a maximum of 30 catch basins) proposed for larvicide treatment be randomly selected and monitored to determine larval presence prior to treatment with *B. sphaericus*.

### **B. Ditches and Temporary or Permanent pools (including storm water management ponds) using methoprene, *Bti* or *B. sphaericus*:**

- MOE **requires** that pre-larviciding monitoring be conducted to determine organic matter content (e.g., presence of algae on water surface indicates high organic content and requires a higher label rate) and/ or larval instar stage (e.g., lower label rate for 1<sup>st</sup> and 2<sup>nd</sup> instars; higher label rate for 3<sup>rd</sup> and 4<sup>th</sup> instars) in order to select the proper application rate of methoprene, *Bti* or *B. sphaericus* (see **Appendix 5** and **Appendix 6**). **Note:** larvae must be present in order to apply *Bti* or *B. sphaericus*.

### **C. Sensitive areas using *Bti* or *B. sphaericus*:**

- MOE **requires** that pre-larviciding monitoring be conducted to determine degree of organic content and larval instar stage in order to select the proper application label rate of *Bti* or *B. sphaericus*.
- MOE **requires** that post-larviciding monitoring of 10 sites (minimum) be conducted to sample for the number of larvae present within 24 - 48 hours after treatment of *Bti* or 48 hours after treatment with *B. sphaericus* (see **Appendix 5**).

### **D. Sewage or Sludge lagoons using methoprene or *B. sphaericus*:**

- No efficacy monitoring requirements if methoprene is used (see section **6.0** below for efficacy monitoring recommendations). MOE **requires** that pre-larviciding monitoring be conducted to determine organic matter content (e.g., presence of algae on water surface indicates high organic content and requires a higher label rate) and larval instar stage (e.g., lower label rate for 1<sup>st</sup> and 2<sup>nd</sup> instars; higher label rate for 3<sup>rd</sup> and 4<sup>th</sup> instars) in

order to select the proper application rate of *B. sphaericus* (see **Appendix 5**). **Note:** larvae must be present in order to apply *B. sphaericus*

## **6.0 MOE Recommendations for Monitoring**

MOE recommendations listed below are at the discretion of the permit holder.

### **A. Catch basins/storm drains using methoprene:**

- MOE **recommends** the pre-larviciding monitoring of catch basins to determine larvae counts and evaluate a need to apply methoprene.
- MOE **recommends** the post-larviciding monitoring of catch basins to determine pupal development to adult (refer to the methoprene product guide literature or the guidance for methoprene efficacy monitoring provided in **Appendix 6**).
- MOE **recommends** pellets and ingots be placed only in catch basin sumps that contain water. Recent studies indicate that lower water levels in a catch basin sump caused by leaf and/or silt debris provides for less water to be retained in the sump increasing the chance of pellets or ingots being flushed out during a heavy rain event.

MOE suggests that 10% of the catch basins (to a maximum of 30 catch basins) proposed for larvicide treatment be randomly selected and monitored for methoprene efficacy.

### **B. Ditches and Temporary or Permanent pools (including storm water management ponds) using methoprene, *Bti* or *B. sphaericus*:**

- MOE **recommends** that post-larviciding monitoring of ditches and temporary or permanent pools to sample for the number of larvae present within 24 - 48 hours after treatment of *Bti* and 48 hours after treatment with *B. sphaericus* or to determine pupal development to adult if using methoprene (refer to the methoprene product guide literature or Appendix 6).

MOE suggests that post-larviciding monitoring should include as a minimum, several ditches, temporary pools and permanent pools and sampling around the margins at several points of these water bodies.

### **C. Sensitive areas using *Bti* or *B. sphaericus*:**

See requirements in section 5.0 above.

### **D. Sewage or Sludge lagoons using methoprene or *B. sphaericus*:**

- MOE **recommends** that pre-larviciding monitoring at 10 sites around the perimeter of sewage or sludge lagoons to determine larval counts and evaluate a need to apply methoprene.
- MOE **recommends** post-larviciding monitoring at 10 sites around the perimeter of sewage or sludge lagoons to sample the number of larvae present if using *B. sphaericus* (see **Appendix 5**) or to determine pupal development to adult if using methoprene (refer to the methoprene product guide literature or the guidance for methoprene efficacy monitoring provided in **Appendix 6**).

## **7.0 Permit Conditions**

Permit applications will be reviewed by the Regional Pesticide Specialists. A permit application that is complete and includes all of the required support documentation will be processed within five business days of receipt.

**A licensed exterminator who is granted an approved permit to apply a larvicide must comply with the requirements of Ontario Regulation 63/09 under the *Pesticides Act*. In addition, the approved permit may have the following conditions:**

- Larvicide use is limited to a licensed exterminator (Mosquito/Biting Flies for ground-based application or Aerial for aircraft application), or a trained Technician under the supervision of a Mosquito/Biting Flies licence holder (in accordance with Ontario Regulation 63/09 under the *Pesticides Act*) or a licensed exterminator who is considered a Technician in accordance with O. Reg. 63/09 under the *Pesticides Act*.
- This permit and conditions of use are approved for 20\_\_ only.
- A copy of the permit must be provided to each larviciding crew at an extermination site.
- Larvicide must be applied according to label directions.
- Larvicide (pellets, ingot or pouch formulations) must be placed into catch basins through the grate. Larvicide must not be applied into catch basins if there is significant water flow, such as during heavy rainfall, which does not allow for the proper settling of the methoprene larvicide at the bottom of each catch basin sump or for the *B. sphaericus* larvicide to properly distribute in the sump water.
- Public notification be provided as set out in the document “Public Notification of a Water Extermination for the Control of Immature Stages of Mosquitoes (Larviciding Programs for WNV)” (see **Appendix 2**).
- The licensed exterminator responsible for the use of the larvicide must immediately report any situations involving health or environmental effects or damage to property resulting from the application of the larvicide to the local MOE District Office (telephone number will be provided on the approved permit), or if a pesticide spill occurs, to the Spills Action Centre at **1-800-268-6060**.
- A summary report (see **Appendix 11** for templates) must be provided by December 1<sup>st</sup> of the year to the Regional Pesticides Specialist.
- Additional conditions determined on a case by case basis.

**Table 1**  
**Ontario Ministry of Environment - Regional Pesticide Specialists**

<b>Region County/Township</b>	<b>Pesticide Specialist(s) Mailing Address</b>	<b>Telephone/Toll Free Fax</b>
<b>Central Region</b> Toronto, Halton, Peel York and Durham, Muskoka, Simcoe	<b>Herman Ploeg</b> <a href="mailto:herman.ploeg@ontario.ca">herman.ploeg@ontario.ca</a> 5775 Yonge St, 8th Floor Toronto, Ontario M2M 4J1	(416) 326-3671  Toll Free 1-800-810-8048 Fax (416) 325-6347
<b>West-Central Region</b> Haldimand, Norfolk, Niagara, Hamilton-Wentworth, Dufferin, Wellington, Waterloo, Brant	<b>Christine Carey</b> <a href="mailto:christine.carey@ontario.ca">christine.carey@ontario.ca</a> 119 King St. West, 12th Floor Hamilton, Ontario L8P 4Y7	(905) 521-7551  Toll Free 1-800-668-4557 Fax (905) 521-7820
<b>Eastern Region</b> Frontenac, Hastings, Lennox & Addington, Prince Edward, Leeds & Grenville, Prescott & Russell, Stormont/Dundas & Glengarry Peterborough, Kawartha Lakes, Northumberland, Renfrew, Ottawa, Lanark, District of Nipissing (Twp. of South Algonquin), Haliburton	<b>Scott Olan</b> <a href="mailto:scott.olan@ontario.ca">scott.olan@ontario.ca</a> 1259 Gardiners Road Kingston, Ontario K7P-3J6	(613) 549-4000 ex 2652  Toll Free 1-800-267-0974 (In Eastern Region only) Fax (613)548-6908
<b>Southwestern Region</b> Elgin, Middlesex, Oxford, Essex, Kent, Lambton, Bruce, Grey, Huron, Perth	<b>Crystal Lafrance</b> <a href="mailto:crystal.lafrance@ontario.ca">crystal.lafrance@ontario.ca</a> <b>Tom Cowan</b> <a href="mailto:tom.cowan@ontario.ca">tom.cowan@ontario.ca</a> 733 Exeter Rd., London, Ontario N6E 1L3	(519) 873-5115  (519) 873-5047  Toll Free 1-800-265-7672 Fax (519) 873-5020
<b>Northern Region (east)</b> Manitoulin, Nipissing, Parry Sound, Sudbury, Algoma (East), Timiskaming, Sault Ste. Marie	Pesticides Specialist 199 Larch Street, Ste 1101 Sudbury, Ontario P3E 5P9	(705) 564-3249  Toll Free 1-800-890-8516 Fax (705) 564-4180
<b>Northern Region (west)</b> Algoma (West), Cochrane, Kenora, Rainy River, Timmins, Thunder Bay	<b>Nadine Dubois</b> <a href="mailto:nadine.dubois@ontario.ca">nadine.dubois@ontario.ca</a> 435 James St. S., Suite 331 Thunder Bay, Ontario P7E 6S7	(807) 475-1712  Toll Free 1-800-875-7772 Fax (807) 475-1754



## OTHER CONTACTS

<p><b>Environmental Assessment and Approvals Branch</b></p> <ul style="list-style-type: none"> <li>▪ Licensing</li> </ul>	<p>2 St. Clair Avenue West, Floor 12A          Toronto, Ontario          M4V 1L5          Tel. 416-314-8001          (toll free 1-800-461-6290)          Fax 416-314-8452</p>	<p><b>Selina Tse</b>          (416) 314-8079  <a href="mailto:selina.tse@ontario.ca">selina.tse@ontario.ca</a></p>
<p><b>University of Guelph - Ridgetown Campus</b></p> <ul style="list-style-type: none"> <li>▪ Certification for licensing</li> <li>▪ Technician Program</li> <li>▪ Vendor Certification</li> </ul>	<p>toll free 1-888-620-9999</p>	
<p><b>Pesticide Industry Regulatory Council (PIRC)</b>  <b>Pesticide Industry Council (PIC)</b></p> <ul style="list-style-type: none"> <li>▪ Technician Program</li> </ul>	<p>Toll free 1-800-615-9813          Toll free 1-800-265-5656</p>	
<p><b>Standards Development Branch</b></p> <ul style="list-style-type: none"> <li>▪ Policy and Notification requirements</li> <li>▪ Pesticide Information</li> </ul>	<p>40 St. Clair Ave W., 7<sup>th</sup> Floor          Toronto ON.          M4V 1M2</p> <p>Tel. 416-327- 5519          Fax: (416) 327-2936</p>	<p><b>Geoff Cutten</b>          (416) 327-5174  <a href="mailto:geoff.cutten@ontario.ca">geoff.cutten@ontario.ca</a></p> <p><b>Ana Gaina</b>          (416) 212-4826  <a href="mailto:ana.gaina@ontario.ca">ana.gaina@ontario.ca</a></p>
<p><b>Environmental Monitoring and Reporting Branch</b></p> <p><b>Environmental Monitoring Studies</b></p> <ul style="list-style-type: none"> <li>▪ Efficacy Studies</li> <li>▪ Water Quality Studies</li> </ul>	<p>125 Resources Rd          Toronto, ON          M9P 3V6</p> <p>Fax: (416) 327-6519</p>	
<p><b>Spills Action Centre</b></p>	<p>1-800-268-6060</p>	

**Table 2 -Ontario Ministry of Natural Resources – West Nile Virus Contacts**

<b>Health Unit</b>	<b>MNR Contact</b>	<b>Title and Location</b>	<b>Phone Number</b>	<b>Email Address</b>	<b>Fax Number</b>
Algoma Health Unit	Ilsa Langis	District Biologist Planner	705-941-5108	ilsa.langis@ontario.ca	705-949-6450
	Tom Kenerknecht	Wawa District Area Biologist	705-856-2396 Ext. 217	tom.kenerknecht@ontario.ca	705-856-7511
	Gord Eason	Wawa District	705-856-2396 Ext. 285	gord.eason@ontario.ca	705-856-7511
Brant County Health Unit	Art Timmerman	Fish And Wildlife Biologist Guelph District	519-826-4935	art.timmerman@ontario.ca	519-826-4929
Chatham-Kent Health Unit	Holly Simpson	Area Biologist Aylmer District	519-354-8210	holly.simpson@ontario.ca	519-354-0313
City of Hamilton Public Health and Community Services Department	Joad Durst	Area Supervisor Guelph District	905-562-1175	joad.durst@ontario.ca	905-562-1154
City of Ottawa Health Department	Shaun Thompson	District Ecologist Kemptville District	613-258-8235	shaun.thompson@ontario.ca	613-258-3920
County of Lambton	Holly Simpson	Area Biologist Aylmer District	519-354-8210	holly.simpson@ontario.ca	519-354-0313
Durham Region Health Department	John Pisapio	Biologist Aurora District	905-713-7387	john.pisapio@ontario.ca	905-731-7361
Eastern Ontario Health Unit	Shaun Thompson	District Ecologist Kemptville District	613-258-8235	shaun.thompson@ontario.ca	613-258-3920
Elgin-St. Thomas Health Unit	Pud Hunter	Biologist Aylmer District	519-773-4713	pud.hunter@ontario.ca	519-773-9014
Grey Bruce Health Unit	Kevin Hawthorne	Area Supervisor Midhurst District	519-371-6751	kevin.hawthorne@ontario.ca	519-372-3305
Haldimand-Norfolk Health Unit	Pud Hunter	Biologist Aylmer District	519-773-4713	pud.hunter@ontario.ca	519-773-9014
Haliburton, Kawartha, Pine Ridge District Health Unit	Cam McCauley	Assessment Biologist Peterborough District	613-531-5705	cam.mccauley@ontario.ca	613-531-5730
Halton Regional Health Unit	Dave Boddington	A/ Superintendent Bronte Creek P.P.	905-827-6911 Ext. 223	dave.boddington@ontario.ca	905-637-4120
Hasting and Prince Edward Counties Health Unit	Erin MacDonald	Area Biologist Bancroft District	613-332-3940 Ext. 259	erin.macdonald@ontario.ca	613-332-0608
Huron County Health Unit	Mike Malhiot	A/ Area Supervisor Guelph District	519-482-3311	mike.malhiot@ontario.ca	519-482-5031
Kingston, Frontenac, Lennox & Addington Health Unit	Cam McCauley	Assessment Biologist Peterborough District	613-531-5705	cam.mccauley@ontario.ca	613-531-5730
Leeds, Grenville, and Lanark District Health Unit	Shaun Thompson	District Ecologist Kemptville District	613-258-8235	shaun.thompson@ontario.ca	613-258-3920
Middlesex-London Health Unit	Pud Hunter	Biologist Aylmer District	519-773-4713	pud.hunter@ontario.ca	519-773-9014
North Bay-Parry Sound District Health Unit	David Beaver	A/IRM Technical Specialist North Bay District	705-475-5525	david.beaver@ontario.ca	705-475-5500
Northwestern Health Unit	Mary Duda	Biologist Kenora District	807-468-2706	mary.duda@ontario.ca	807-468-2736
Oxford County Board of Health	Pud Hunter	Biologist Aylmer District	519-773-4713	pud.hunter@ontario.ca	519-773-9014
Peel Regional Health Unit	John Pisapio	Biologist Aurora District	905-713-7387	john.pisapio@ontario.ca	905-731-7361

<b>Health Unit</b>	<b>MNR Contact</b>	<b>Title and Location</b>	<b>Phone Number</b>	<b>Email Address</b>	<b>Fax Number</b>
Perth District Health Unit	Mike Malhiot	A/ Area Supervisor Guelph District	519-482-3311	mike.malhiot@ontario.ca	519-482-5031
Peterborough County-City Health Unit	Cam McCauley	Assessment Biologist Peterborough District	613-531-5705	cam.mccauley@ontario.ca	613-531-5730
Porcupine District Health Unit	Sarah Vascotto	Planning & Information Management Biologist Chapleau District	705-864-3162	sarah.vascotto@ontario.ca	705-864-0681
	Leeanne Beaudin	Fish & Wildlife Technical Specialist Cochrane District	705-272-7156	leeanne.beaudin@ontario.ca	705-272-7183
	Christine Greenaway	Planning Biologist Timmins District	705-235-1311	christine.greenaway@ontario.ca	705-235-1377
	John Sadowsky	Area Biologist Hearst District	705-337-9317	john.sadowsky@ontario.ca	705-337-9345
Regional Municipality of Waterloo, Community Health Department	Art Timmerman	Fish And Wildlife Biologist Guelph District	519-826-4935	art.timmerman@ontario.ca	519-826-4929
Regional Niagara Public Health Department	Joad Durst	Area Supervisor Guelph District	905-562-1175	joad.durst@ontario.ca	905-562-1154
Renfrew County and District Health Unit	Darwin Rosien	Senior Fish & Wildlife Inventory/Assessment Technician Pembroke District	613-732-5533	darwin.rosien@ontario.ca	613-732-2972
Simcoe-Muskoka District Health Unit	John Kus	Area Supervisor Midhurst District	705-725-7534	john.kus@ontario.ca	705-725-7584
	Christy MacDonald	F&W Technical Specialist Parry Sound District	705-646-5522	christy.macdonald@ontario.ca	705-645-8372
Sudbury and District Health Unit	Mike Hall	Area Biologist Sudbury District	705-564-7862	mike.hall@ontario.ca	705-564-7879
	Christine Greenaway	Planning Biologist Timmins District	705-235-1311	christine.greenaway@ontario.ca	705-235-1377
Thunder Bay District Health Unit	Michael Deschamps	Area Biologist Thunder Bay District	807-475-1128	michael.deschamps@ontario.ca	807-475-1527
	Dave Arola	Senior Fish & Wildlife Technician Wawa District	807-826-3225 Ext. 224	dave.arola@ontario.ca	807-826-4631
		Derek Elliott	Integrated Resource Management Technical Specialist Kirkland Lake District	705-568-3229	derek.elliott@ontario.ca
Toronto Public Health	John Pisapio	Biologist Aurora District	905-713-7387	john.pisapio@ontario.ca	905-731-7361
Wellington-Dufferin-Guelph Health Unit	Art Timmerman	Fish And Wildlife Biologist Guelph District	519-826-4935	art.timmerman@ontario.ca	519-826-4929
Windsor-Essex County Health Unit	Holly Simpson	Area Biologist Aylmer District	519-354-8210	holly.simpson@ontario.ca	519-354-0313
York Region Health Services Department	John Pisapio	Biologist Aurora District	905-713-7387	john.pisapio@ontario.ca	905-731-7361

## Appendix 1

### Permit Application Forms

MOE requests that the permit application be completed and signed by an appropriately licensed exterminator who is responsible for the larviciding program. Form 1866 – Application for a Permit to Perform a Water Extermination for West Nile Virus Control (Catch Basins) and Form 1867 – Application for a Permit to Perform a Water Extermination for West Nile Virus Control (Surface Water) are available online at the Ontario Central Form Repository. Please refer to the following website:

<http://www.forms.ssb.gov.on.ca/mbs/ssb/forms/ssbforms.nsf/MinistryResults?Openform&SRT=T&MAX=5&ENV=WWE&STR=1&TAB=PROFILE&MIN=012&BRN=07&PRG=37>

**Appendix 2**  
**Public Notification of a Water Extermination**  
**for the Control of Immature Stages of Mosquitoes**  
**(Larviciding Programs for West Nile Virus)**

The Director under the *Pesticides Act* may impose a permit condition that requires the public be notified when a larvicide is used in a water extermination. The following table indicates the options the Director under the Act may consider:

**Private Land Programs**

Site	Option
A. Catch Basins	1, 2
B. Ditches, temporary or permanent pools including storm water management ponds	1,2,3
C. Sewage or sludge lagoons	1,2,3
D. Sensitive Areas	1,2,3

**Option 1 - Newspaper**

Publication of a notice in a newspaper of general circulation in the vicinity of the proposed water extermination at the beginning of the larviciding program and printed such that it is not less than 10 cm in width. (For example, a notice would be published in a local newspaper prior to April X indicating that larvicide will be placed in catch basins on the private land every three weeks until October X). See sample notice below.

**Option 2 – Written Notice**

Distribution of a written notice at the beginning of the larviciding program to all land owners or persons in charge of land within the application area. In addition, the posting of the notice at all door entrances to public buildings on the private land prior to each larviciding treatment and to remain posted for at least 48 hours. (For example - catch basin larviciding at several schools; a notice would be provided to the superintendent of the school board and to the principal of each school in April. In addition, the notice must be posted before each larviciding treatment and remain posted for at least 48 hours on all entrance doors to the school where the larvicide is being applied). See sample notice below that can also be modified for surface water larviciding.

The notice in Option 1 and 2 above must include the following:

- The details of the larviciding program including:
  - the pest to be controlled (i.e., mosquito larvae) and purpose for control (i.e., West Nile Virus).
  - proposed date(s) the water extermination is to take place.
  - the location of the larviciding program (e.g., name of the water body, street boundaries, all catch basins on a specific street, etc.).
  - the name of the larvicide and the registration number assigned to the product under the *Pest Control Products Act* (Canada).
  - the formulation (e.g., pellet, granular, ingot, liquid, pouch).

- a telephone number (indicating collect calls will be accepted) that provides the public with information regarding the larviciding program and includes updates on the street location and dates of larviciding. A web site may be used in addition to a telephone number.

**Sample Notice for Catch Basins:**

**NOTICE OF PESTICIDE USE**

Between April 1 to October 31, 20\_\_ the *[name of private land]* will be conducting a larviciding program under the authority of the Local Medical Officer of Health to control larval mosquitoes in order to prevent their development into vectors of West Nile Virus. The pellet formulation of the larvicide methoprene *[provide Product Name and registration number under the Pest Control Products Act (Canada)]* will be placed into catch basins of storm drains in the following area *[provide street address(es)]*. All larvicide will be applied by applicators, licensed by the Ministry of the Environment, or supervised technicians. For details on the exact locations and dates of treatment please call *[1-800----- if not a toll-free number indicate collect calls will be accepted]* or at the following web site: *www.-----*.

**Option 3 - Signs**

- For the purposes of a water extermination the Director under the Act may impose a permit condition allowing the use of public notification signs that are used for land extermination pesticide use notification. The conspicuous posting of a residential or non-residential area NOTICE sign every 100 metres along the perimeter of the surface water body OR at all entrances to the land immediately before the application of the larvicide and remaining for at least 48 hours. The residential area NOTICE sign is used when the surface water is located on a property that meets the definition of “residential area” in S. 1 of Ontario Regulation 63/09. A non-residential NOTICE sign must be used on a property that does not meet the definition of “residential area”. The NOTICE signs are posted on the ministry website at: <http://www.ene.gov.on.ca/en/land/pesticides/signs.pdf> and show the proper formatting and wording.

### Appendix 3

#### Mosquito Larvicides Currently Federally Registered and Classified for Use In Ontario for WNV

Reg. No.	Product Name Active Ingredient	Aerial * Yes/No	Registrant/ Agent Address	Fed. Class	Ont. Class
18158	Vectobac 200G Biological Larvicide <i>Bacillus thuringiensis</i> Serotype H-14 (0.2 ITU/L)	Y	Valent Biosciences Canada Ltd. 40 King St. W. Suite 2100 Toronto, On M5H 3C2	R	3
19239	Teknar Granules Larvicide for Mosquito <i>Bacillus thuringiensis</i> Serotype H-14 (260 AAU/mg)	Y	Valent Biosciences Canada Ltd. 40 King St. W. Suite 2100 Toronto, Ontario M5H 3C2	R	3
19241	Teknar HP-D Larvicide for Mosquitoes/ Black-Fly control <i>Bacillus thuringiensis</i> (3000 AU/mg)	Y	Valent Biosciences Canada Ltd. 40 King St. W. Suite 2100 Toronto, Ontario M5H 3C2	R	3
19466	Vectobac- 200G Biological Larvicide <i>Bacillus thuringiensis</i> (200 ITU/mg)	N	Valent Biosciences Canada Ltd. 40 King St. W. Suite 2100 Toronto, Ontario M5H 3C2	C	4
21062	Vectobac 1200L Biological Insecticide <i>Bacillus thuringiensis</i> Serotype H-14 (1.2 BIU/kg)	Y	Valent Biosciences Canada Ltd. 40 King St. W. Suite 2100 Toronto, Ontario M5H 3C2	R	3
21809	Altosid Pellets Methoprene 4.25%	Y	Wellmark Int. 5420 Hwy. 6 N., Suite B30 RR5 Guelph, ON N1H 6J2	R	3
22676	Altosid Granules Methoprene 1.5%	Y	Wellmark Int. 5420 Hwy. 6 N., Suite B30 RR5 Guelph, ON N1H 6J2	R	3
26860	Aquabac xt <i>Bacillus thuringiensis</i> Serotype H-14 (200 ITU/mg)	Y	AFA Environmental Inc. 1100 Rene Levesque Blvd. W. 25 <sup>th</sup> Fl. Montreal, QC H3B 5C9	R	3
26862	Aquabac 200G <i>Bacillus thuringiensis</i> Serotype H-14 (200 ITU/mg)	N	AFA Environmental Inc. 1100 Rene Levesque Blvd. W. 25 <sup>th</sup> Fl. Montreal, QC H3B 5C9	C	4
26863	Aquabac 200G <i>Bacillus thuringiensis</i> Serotype H-14 (200 ITU/mg)	Y	AFA Environmental Inc. 1100 Rene Levesque Blvd. W. 25 <sup>th</sup> Fl. Montreal, QC H3B 5C9	R	3
27374	Aquabac 200G Biological Larvicide <i>Bacillus thuringiensis</i> 10/14	N	AFA Environmental Inc. 1100 Rene Levesque Blvd. W. 25 <sup>th</sup> Fl. Montreal, QC H3B 5C9	D	5**
27376	Aquabac II xt Biological Larvicide <i>Bacillus thuringiensis</i> Serotype H-14 (1200 ITU/mg)	N	AFA Environmental Inc. 1100 Rene Levesque Blvd. W. 25 <sup>th</sup> Fl. Montreal, QC H3B 5C9	C	4
27694	Altosid XR Briquets Methoprene 2.1%	N	Wellmark Int. 5420 Hwy. 6 N., Suite B30 RR5 Guelph, ON N1H 6J2	R	3
28007	Vectolex WDG Biological Larvicide <i>Bacillus sphaericus</i> Strain 2362, 650 BsITU/mg	Y	Valent Biosciences Canada Ltd. 40 King St. W. Suite 2100 Toronto, Ontario M5H 3C2	R	3
28008	Vectolex CG Biological Larvicide <i>Bacillus sphaericus</i> Strain 2362, 50 BsITU/mg	Y	Valent Biosciences Canada Ltd. 40 King St. W. Suite 2100 Toronto, Ontario M5H 3C2	R	3
28009	Vectolex WSP Biological Larvicide <i>Bacillus sphaericus</i> Strain 2362 50 BsITU/mg	N	Valent Biosciences Canada Ltd. 40 King St. W. Suite 2100 Toronto, Ontario M5H 3C2	R	3
28070	Altosid Liquid Larvicide Mosquito Growth Regulator Methoprene	Y	Wellmark Int. 5420 Hwy. 6 N., Suite B30 RR5 Guelph, ON N1H 6J2	R	3
28152	Pre-Strike Granules Methoprene 1.5%	N	Wellmark Int. 5420 Hwy. 6 N., Suite B30 RR5 Guelph, ON N1H 6J2	D	5**
28888	Mosquito Dunks <i>Bacillus thuringiensis</i> Serotype H-14	N	Summit Chemical Co. 235 South Kresson St. Baltimore, Md. USA 21224	D	5**

Consult with the PMRA at 1-800-267-6315 to ensure current registration status.

\* A pesticide may only be applied by aircraft if the label directions specify this method of application.

\*\* A permit is not required if a pesticide is applied by the land owner/occupant or their full-time employee in a wholly contained water body with no direct or indirect outflow from the land (see s. 83(3) of O. Reg. 63/09).

## Appendix 4 Templates

1. Local Medical Officer of Health (MOH) Order under S. 13 of the *HPPA*
2. MOH Authorization Letter for Larviciding on Municipal/Private Land
3. Jurisdictional Authorization for HU to contract larviciding in water bodies that drain into town, city or municipality owned storm drain systems or waterways and in water bodies situated on private lands that drain into town, city or municipality owned storm drain systems or waterways
4. Private land owner/occupant authorization to apply larvicides in a water body on the private land by a licensed exterminator. Note: the following templates may contain statements that do not apply to all jurisdictions.

### **Template 1. Local Medical Officer of Health (MOH) Order under S. 13 of the HPPA**

Order Made Pursuant to Section 13 of the *Health Protection and Promotion Act*, R.S.O. 1990, c. H.7

Date:

To:

WHEREAS pursuant to the *Health Protection and Promotion Act*, R.S.O. 1990, c. H.7, as amended (the "Act"):

1. a "health hazard" includes any thing or "animal other than man" that has or that is likely to have an adverse effect on the health of any person;
2. the Medical Officer of Health may, by order, require any person to take, or refrain from taking any specified action with respect to a health hazard. Such an order may include a requirement to do specified work, on or about premises specified in the order, and may include a requirement to destroy things specified in the order,
3. the Medical Officer of Health, or a person acting under his/her direction, is authorized to enter and have access to, through and over any premises in order to carry out a direction given under the *Act*. The authority to enter premises, however, is not authority to enter a private residence without the consent of the occupier;
4. no person shall hinder or obstruct a person acting under the direction of a Medical Officer of Health lawfully carry out a power, duty or direction under this *Act*;
5. any person who fails to obey an order made under this *Act* is guilty of an offence and is liable on conviction to a fine as outlined below; and
6. every board of health is required to ensure the provision of health programs and services including the prevention or elimination of health hazards and the control of infectious and reportable diseases.

AND WHEREAS pursuant to section 474.21 of the *Municipal Act*, 2001, S.O. 2001, c. 25, the [name of regional municipality] has all the powers, rights and duties of a board of health under the *Health Protection and Promotion Act* 2002, c. 17, Sched. A, s. 91.; [NOTE: this statement applies only to regional municipalities and does not include The District Municipality of Muskoka].

I, [name of Medical Officer of Health of the name of jurisdiction] order you to assist in, and facilitate the implementation of, such treatment methods as directed by me, in the [name of jurisdiction under the order], to control and reduce the number of mosquito larvae including, but not limited to assisting in and facilitating the:

1. application of larvicides to known or suspected mosquito breeding sites including but not limited to areas of standing water in catch basins, storm water management ponds, ditches, ponds and other bodies of water; and
2. employment of measures to eliminate standing water on public and private land;

THE REASONS FOR THIS ORDER ARE THAT:

1. in 200\_, the Medical Officer of Health received laboratory confirmation that certain persons in [name of MOH's jurisdiction] became infected with the West Nile Virus;



2. in 200\_, the Medical Officer of Health received laboratory confirmation that certain mosquitoes in the [name of MOH's jurisdiction] were infected with the West Nile Virus;
3. West Nile Virus is transmitted to humans by mosquitoes. Mosquitoes are known to breed in areas of standing water within [name of MOH's jurisdiction] including catch basins, storm water management ponds, ditches, ponds and other bodies of water;
4. West Nile Virus can adversely affect human health and, in some cases, can cause death;
5. it is reasonable to expect that mosquitoes infected with West Nile Virus are now breeding and the risk of human infection will increase as the weather becomes warmer;
6. to protect human health, I believe it necessary to institute a mosquito control program which includes the application of larvicides to areas of standing water which may contain mosquito larvae and populations;
7. to be effective, larviciding must take place in the spring and summer in an attempt to reduce the number of infected mosquitoes and the consequent threat to human health; and
8. I am advised by [name of MOH's jurisdiction] Public Health representatives that the [name of MOH's jurisdiction] has retained a licensed applicator of larvicides to apply mosquito control treatment methods on public and private land which application program can start forthwith.

Therefore, I am of the opinion on reasonable and probable grounds that:

1. a health hazard exists in the Health Unit served by me; and
2. the requirements specified in this order are necessary to decrease or eliminate the health hazard.

#### **NOTICE**

TAKE NOTICE THAT you are entitled to a hearing by the Health Services Appeal and Review Board if you deliver to me and to the Health Services Appeal and Review Board, Health Boards Secretariat, 151 Bloor Street West, 9<sup>th</sup> Floor, Toronto, Ontario. M5S 2T5, notice in writing, requesting a hearing within fifteen (15) days after service of this Order.

AND FURTHER TAKE NOTICE THAT although a hearing may be requested, this Order takes effect when it is served to you.

FAILURE to comply with this Order is an offence for which you may be liable, on conviction, to a fine of not more than \$5,000.00 (for a person) or \$25,000.00 (for a corporation) for every day or part of each day on which the offence occurs or continues.

[Signature of MOH]

#### **Template 2. MOH Authorization Letter for Larviciding on Public/Private Land**

To: Regional Pesticide Specialist [see Table 1 for address]

Dear:

RE: West Nile Virus - Application of Larvicides on [Municipal/Private] Lands

This letter is to confirm that I authorize the application of larvicides to mosquito breeding sites on [municipal/private] lands with the [name of MOH's jurisdiction], especially as it relates to standing waters and catch basins. I also authorize the application of larvicides to other areas within the [name of MOH's jurisdiction], under the jurisdiction of other governmental authorities, found to contain mosquito species known to transmit West Nile virus.

My decision to authorize this action is based on the Health Department's 200\_ WNV surveillance and monitoring program which identified human cases as well as extensive enzootic spread. These findings represent a significant health risk to the residents of [name of MOH's jurisdiction].

This authorization has the following conditions:

- Application of larvicide to water bodies on private land only if the water body cannot be drained or modified.

- The licensed exterminator must provide a copy of all approved permits to the MOH. The information submitted must identify clearly the addresses of the private lands and the type of water bodies intended to be treated with a mosquito larvicide before the larviciding program begins.
  - Copies of the year end reports (summary reports) submitted to the Ministry of the Environment, when completed, for all permits issued must be also submitted to the Health department.
- I am also enclosing copies of letters from [town, city or municipalities] in the [name of MOH's jurisdiction].

[Signature of the Medical Officer of Health (MOH)]

### **Template 3. Jurisdictional Authorization**

To: Local MOH

Dear MOH:

The [name of town, city or municipality etc.] supports local action to reduce the risk of West Nile Virus. As a result, [name of town, city or municipality etc.] authorizes any permit application for West Nile Virus control submitted to the Ministry of the Environment from an appropriately licensed exterminator, to apply a larvicide into catch basins or surface water:

- located within and [owned/ managed] by [name of town, city or municipality]; and
- located on private land that drain into the storm drain system or water ways located within [name of town, city or municipality].

[Signed by an official representative of the town, city, municipality etc.]

### **Template 4. Private Land Owner/Occupant Authorization**

To: Local MOH

Dear MOH:

I [name of private land owner or occupant] authorize [name of licensed exterminator and pest management company] to apply a larvicide into water bodies located on my land in order to reduce the risk of West Nile Virus.

[Signed by the private land owner or occupant]

**GUIDANCE FOR *BACILLUS THURINGIENSIS* var. *ISRAELENSIS* (Bti) AND  
*BACILLUS SPHAERICUS* (*B. Sphaericus*) EFFICACY MONITORING**

COLLECTION DATA	Date:	Location No.:	Collector's Name:
Location Description (if no location no.):			

BREEDING SITE DESCRIPTION	
Site Type (Check one): Ditch <input type="checkbox"/> Temporary Pool <input type="checkbox"/> Permanent Pool <input type="checkbox"/> Storm Water Management Pond <input type="checkbox"/> Sensitive Area <input type="checkbox"/> (Describe _____) Other Type of Surface water Site _____	
Organic level* of water: low <input type="checkbox"/> moderate <input type="checkbox"/> high <input type="checkbox"/>	Water Temperature: _____
Pool Length (m): _____ Width (m): _____ Depth (m): _____	Emergent Vegetation: Nil <input type="checkbox"/> Low <input type="checkbox"/> Mod. <input type="checkbox"/> High <input type="checkbox"/>

\*Organic content of the water can be determined by taking a clear glass container and dipping it below the water surface. Hold the glass container up to the light. If you can see through the water the organic content is low, if the water is translucent the organic content is moderate and if you cannot see through the water the organic content is high. If algae or scum is found on the water surface the water should be considered as high organic content.

PRE-LARVICIDING SEQUENTIAL SAMPLING			Pool rating*: Nil <input type="checkbox"/> Low <input type="checkbox"/> Moderate <input type="checkbox"/> High <input type="checkbox"/> (see below)		
Dip No.	No. of Larvae	Cumulative No.	Dip No.	No. of Larvae	Cumulative No.
1			6		
2			7		
3			8		
4			9		
5			10		

**\* Pool Rating**

A. If no larvae are collected, the site is rated as "nil".

B. If only 1 to 6 larvae are collected in 10 dips, this site is rated as "low".

C. If 7-30 larvae are collected in 10 dips, this site is rated as "moderate".

D. If >30 larvae are collected in 10 dips, this site is rated as "high".

E. If the number of larvae collected in at least 5 dips is 51 or more, the site is rated as "high".

Note: if the surface area of the site is greater than 50 m by 50 m (2500 m<sup>2</sup>), then the number of dips taken should be doubled.

SPECIES IDENTIFICATION			<i>Culex pipiens</i> CP, <i>Culex restuans</i> CR, <i>Culex salinarius</i> CS, <i>Aedes vexans</i> AV, <i>Coquillettidia perturbans</i> CP, <i>Anopheles punctipennis</i> AP, <i>Ochlerotatus triseriatus</i> OT, <i>Ochlerotatus cantator</i> OC, <i>Ochlerotatus trivittatus</i> OTR.		
Species Code	Larva Instar (1-4)	No. Identified	Species Code	Larva Instar (1-4)	No. Identified

POST-LARVICIDING SEQUENTIAL SAMPLING			Pool rating*: Nil __ Low __ Moderate __ High __		
Dip No.	No. of Larvae	Cumulative No.	Dip No.	No. of Larvae	Cumulative No.
1			6		
2			7		
3			8		
4			9		
5			10		

*Bti* - check for larval control within 24-48 hours of application

*B.sphaericus* - check for larval control 48 hours after application. First and second instar larvae are likely to be present on recheck. *B. sphaericus* recycles in larval cadavers.

**Appendix 6**

**MOE Permit Number**

**GUIDANCE FOR METHOPRENE EFFICACY MONITORING**

<b>COLLECTION DATA</b>	Date: _____	Location No.: _____	Collector's Name: _____
Location Description (if no location no.): _____			
<b>BREEDING SITE DESCRIPTION</b>			
Site Type (Check one): Catch Basin/Storm Drain <input type="checkbox"/> Sewage/Sludge Lagoon <input type="checkbox"/> Ditch <input type="checkbox"/> Temporary Pool <input type="checkbox"/> Permanent Pool <input type="checkbox"/> Storm Water Management Pond <input type="checkbox"/> Pond <input type="checkbox"/>			
Organic level* of water: low <input type="checkbox"/> moderate <input type="checkbox"/> high <input type="checkbox"/>		Water Temperature: _____	
Lagoon Length (m): _____ Width (m): _____ Depth (m): _____		Emergent Vegetation: Nil <input type="checkbox"/> Low <input type="checkbox"/>	
Pool length (m): _____ Width(m): _____ Depth (m): _____		Mod. <input type="checkbox"/> High <input type="checkbox"/>	

\*Organic content of the water can be determined by taking a clear glass container and dipping it below the water surface. Hold the glass container up to the light. If you can see through the water the organic content is low, if the water is translucent the organic content is moderate and if you cannot see through the water the organic content is high. If algae or scum is found on the water surface the water should be considered as high organic content.

<b>PRE-LARVICIDING SEQUENTIAL SAMPLING</b>			Pool rating*: Nil <input type="checkbox"/> Low <input type="checkbox"/> Moderate <input type="checkbox"/> High <input type="checkbox"/> (see below)		
Dip No.	No. of Larvae	Cumulative No.	Dip No.	No. of Larvae	Cumulative No.
1			6		
2			7		
3			8		
4			9		
5			10		

**\* Pool Rating**

- 1.If no larvae are collected, the site is rated as “nil”.
  - 2.If only 1 to 6 larvae are collected in 10 dips, this site is rated as “low”.
  - 3.If 7-30 larvae are collected in 10 dips, this site is rated as “moderate”.
  - 4.If >30 larvae are collected in 10 dips, this site is rated as “high”.
  - 5.If the number of larvae collected in at least 5 dips is 51 or more, the site is rated as “high”.
- Note:** if the surface area of the site is greater than 50 m by 50 m (2500 m<sup>2</sup>), then the number of dips taken should be doubled.

<b>SPECIES IDENTIFICATION</b>		<i>Culex pipiens</i> CP, <i>Culex restuans</i> CR, <i>Culex salinarius</i> CS, <i>Aedes vexans</i> AV, <i>Coquillettidia perturbans</i> CP, <i>Anopheles punctipennis</i> AP, <i>Ochlerotatus triseriatus</i> OT, <i>Ochlerotatus cantator</i> OC, <i>Ochlerotatus trivittatus</i> OTR.			
Species Code	Larva Instar (1-4)	No. Identified	Species Code	Larva Instar (1-4)	No. Identified

**POST-LARVICIDING MONITORING FOR METHOPRENE EFFICACY**

1. Determine the catch basins that will be used in the monitoring study. Take samples of pupae from these same catch basins every week. Note the date when the larvicide was applied, the organic content, any oil sheen on water surface and temperature of the water. Do not take samples after a major rain event since pupae will likely to have been flushed out of the catch basin.
2. Collect 3 separate samples of pupae only once a week from each of the randomly selected treated catch basins and from nearby untreated catch basins (if available). Record number of pupae.
3. Place the pupae in a covered clear glass or plastic container (half-filled with water from the catch basin) and cover with netting or screening. Transport in a cooler with ice packs. Place the container in a sheltered area where the pupae will not be disturbed. Keep at a constant temperature, without direct light (i.e., they can be kept in a room in which the light is on during the day and turned off at night).
4. Check for emergence every day for up to four days.
5. Count the number of dead pupae (DP), dead adults (DA) and live adults (AA).
6. Use the following formula to determine the % control =  $(DP+DA) \div (DP+DA+AA) \times 100$
7. Record results in an Excel spreadsheet format to facilitate calculations (see example below)

Most catch basins should have less than 10% emergence up to 21 days using methoprene pellets. Some catch basins may show less control (perhaps due to flushing, larger than normal size catch basin or storm drain, or some other reason) and should be retreated.

**Recording Results:**

Treated Site	No. of Pupae	DP	DA	AA	% Control	Control Site	No. of Pupae	DP	DA	AA	% Control
Sample 1						Sample 1					
Sample 2						Sample 2					
Sample 3						Sample 3					
Sample 4						Sample 4					
Sample 5						Sample 5					
Sample 6						Sample 6					
Sample 7						Sample 7					
Sample 8						Sample 8					
Sample 9						Sample 9					
Sample 10						Sample 10					

## **Appendix 7 Sensitive Areas Definitions**

**WETLANDS:** Are lands that are seasonally or permanently covered by shallow water as well as lands where the water table is close to, or at the surface; in either case, the presence of abundant water has caused the formation of hydric soils and has favoured the dominance of either hydrophytic or water tolerant plants. The general term wetlands, includes specific land types that are known as swamps, marshes, bogs and fens.

- Swamps are wooded wetlands with 25% cover or more of trees or tall shrubs. In swamps, standing to gently flowing waters occur seasonally or persist for long periods on the surface. Swamps include both forest and thicket swamps.
- Marshes are areas periodically inundated with standing or slowly moving water, and/or permanently inundated characterized by robust emergents, and to a lesser extent, anchored floating plants and submergents.
- Bogs are peat-covered areas or peat-filled depressions with a high water table and a surface carpet of mosses, chiefly *Sphagnum* spp.
- Fens are peatlands characterized by surface layers of poorly to moderately decomposed peat, often with well decomposed peat near the base. They are covered by a dominant component of sedges, although grasses and reeds may be associated in local pools.

Periodically soaked or wet lands being used for agricultural purposes which no longer exhibit wetland characteristics are not considered to be wetlands for the purposes of this definition.

Other sensitive areas are defined below.

**CRITICAL FISH HABITAT:** Those habitat areas which are needed to maintain the overall productive capacity of the fishery. These can include spawning areas for fish species with stringent spawning requirements, such as cobble areas for walleye and Lake trout, ground water upwelling areas for Brook trout; highly productive nursery and feeding areas such as wetlands; areas with Species at Risk; essential refuge areas such as winter refugium for Brook trout in small streams; habitat that are not replaceable or compensatable such as ground water upwellings, and migration routes which provide access to spawning areas for fish species with stringent spawning requirements (e.g., Brook trout). These include habitat types that are relatively rare or sensitive to disturbance. Alterations in these areas will result in a loss of productive capacity of fish habitat. Critical habitat require a high level of protection because of their importance in sustaining subsistence, commercial or recreational fisheries, their rareness, their high productive capacity, the sensitivity of certain life states for the fish species they support etc.

**FISH SANCTUARY:** Is a water body (or a portion of a water body) in which fishing for all species is prohibited for a specified period of time and is identified in the annual Ontario Sport Fishing Regulations summary, available from the MNR at:

[http://www.mnr.gov.on.ca/en/Business/LetsFish/Publication/STEL02\\_163615.html](http://www.mnr.gov.on.ca/en/Business/LetsFish/Publication/STEL02_163615.html)

**ENDANGERED AND THREATENED SPECIES HABITAT:** See SARS Policy 4.1 at

<http://www.mnr.gov.on.ca/249941.pdf> and

<http://www.mnr.gov.on.ca/en/Business/Species/2ColumnSubPage/244543.html>

for definitions of “significant” in regard to endangered and threatened species and for definitions of endangered species and threatened species.

**See Appendix 10 for the Sensitive Area and Species Protocol.**

## Appendix 8

### Assessing Catch Basins to Determine Application Rate of Methoprene Pellets

Most modern catch basins are cylindrical, have 900 mm diameter (0.9 m diameter or 0.45 m radius), are 2.3-2.4 m deep in total (including ring spacers and cover), have a water depth below the outlet pipe of 600 mm (when there is no flow), and a water surface area of 0.636 m<sup>2</sup>. However, older catch basins may be of different sizes, shapes, and have different surface areas. Thus, it is important that mosquito control workers consult local public works officials on the dimensions of the catch basins in any particular area of the jurisdiction. Catch basins in newer suburban areas may differ in size from those in older downtown areas and along highways within a municipality or Health Unit.

Public Work officials may be able to provide computer-based maps and a numbering system for the catch basins within their jurisdiction. Some databases may also include information on the size of individual catch basins.

Drainage from some catch basins may be partially blocked, increasing the total water volume associated with that catch basin and others 'upstream' from it. Local water engineers may be able to advise on what percentage of the catch basins fall into this category and where they are most likely to be located.

Calculations showing how much methoprene pellets to apply to a standard modern catch basin have been provided (see below). It may be necessary to inspect a representative sample of catch basins (e.g., 1%) and base the application rate on the average surface area of the catch basins in an area.

#### **Sample Calculations**

**Assumption:** the catch basin has a 0.45 m radius.

**Formula Used:** Area (circle) = (r<sup>2</sup> (pi x radius squared) where ( = 3.14159

**Area of Standard Catch Basin:** 3.14159 x 0.45 m x 0.45 m = 0.636 m<sup>2</sup>

**Application Rates based on methoprene pellets:** Label rate states - 5.6 -11.2 kg/ha or 0.56 - 1.12 g/m<sup>2</sup> of water surface, then

Low application rate = 0.636 m<sup>2</sup> x 0.56 g/m<sup>2</sup> = 0.356 g

High application rate = 0.636 m<sup>2</sup> x 1.12 g/m<sup>2</sup> = 0.712 g

The water in a catch basin can be considered to be polluted and/or highly organic therefore the high application rate is recommended on the label.

#### **Amount to Use per Catch Basin:**

How much methoprene pellets is 0.712 g?

From the Material Safety Data Sheet (MSDS), we find Specific Gravity = 1.04 g/cc

Thus, 1.04 g/1 cc = 0.712 g/'x' cc; therefore, 'x' = 0.69 cc

Because 1 teaspoon = 5 cc then 0.69 cc = ~ 0.14 teaspoons use slightly under a quarter teaspoon/ standard catch basin

#### **Measuring Spoons:**

Long-handled measuring spoons are available as part of a set from most food and department stores. Due to the irregular shape of the pellets, a level 0.25 teaspoon of methoprene pellets would be a practical treatment per one standard catch basin.



## Appendix 9

### Submitting Geo-spatial Information for Private Land Mosquito Control Programs

The use of Geographic Information System (GIS) databases will provide a more efficient way of analysing the surveillance, monitoring and larviciding data collected to manage West Nile virus. The Ministry of the Environment is encouraging that all mapping data be submitted in electronic format including digital mapping coordinates derived from Global Positioning Systems (GPS). Digital map coordinates for all catch basins, ditches, temporary and permanent pools and storm water retention ponds areas could be submitted with either the permit application and/or final report. MOE will use the information to generate provincial maps for Ministry purposes in evaluating permit applications.

To ensure that there is consistency across the province, all geo-spatial data including both map coordinates and tabular information need to be submitted in electronic format conforming to the data standards summarized below.

The standards which follow apply to all data submitted including format requirements for digital mapping coordinates and address standards:

- Electronic map files must be ESRI software technology compatible (i.e., Arc/Info coverages or ArcGIS shape files) referenced to North American Datum 83 (NAD83) projected using the Universal Transverse Mercator (UTM) projection system. UTM zone and accuracy estimates must be provided (see example below)
- All map coordinates should be submitted in a spreadsheet or database (Excel or MS Access)
- When data is submitted electronically in a spread sheet or database format, columns should use clearly identified titles and provide a detailed description of codes used
- Standard street addresses must include street number, proper spelling of the street name, standard abbreviations (see below), direction (N, S, E, W) and municipality addresses should not include any punctuation

#### Map Data Example:

ID	Zone	Easting	Northing	Accuracy
1	17	611630.56	4861180.03	±10m
2	17	622507.43	4865770.27	±10m

#### Address Example:

ID	Address	Municipality
1	1180 Lakeshore RD W	Toronto
2	252 Bloor ST E	Toronto
3	2075 Bayview AVE	Toronto

Some of the most common abbreviations include, but are not limited to the following:

Avenue	AVE	Gardens	GDNS	Square	SQ
Bay	BAY	Gate	GATE	Sideroad	SR
Beach	BEACH	Heights	HTS	Street	ST
Boulevard	BLVD	Highway	HWY	Terrace	TERR
Centre	CTR	Lane	LANE	Trail	TRAIL
Circle	CIR	Line	LINE	View	VIEW
Concession	CONC	Meadow	MEADOW	Way	WAY
Corners	CRNRS	Park	PK		
Court	CRT	Parkway	PKY		
Crescent	CRES	Path	PATH		
Cul-de-sac	CDS	Place	PL		
Drive	DR	Point	PT		
Expressway	EXPY	Road	RD		

## Appendix 10 Sensitive Areas and Species Protocol

### Ontario Ministry of Natural Resources Process for Providing Input to MOE Concerning West Nile Virus Larvicide Treatments in Sensitive Areas

#### INTRODUCTION

Public Health Units may order the use of larvicides in Sensitive areas, to control mosquito populations and the spread of West Nile Virus (WNV). Decisions to implement WNV control measures are based on local risk assessments, which include consideration of the results of mosquito larvae surveillance and proximity of areas of standing water to inhabited areas.

The Ontario Ministry of the Environment (MOE) is responsible for regulating and licensing the use of pesticides, including the larvicides used to control mosquito populations. The bacterial larvicide *Bacillus thuringiensis israelensis (Bti)* and *Bacillus sphaericus* are the only mosquito treatment permitted in Sensitive areas. It targets the larvae of mosquitoes and other dipterans.

An inter-agency review committee has been established, in response to the potential negative impacts of such treatments on rare and sensitive species that may be present in these habitats. The committee consists of representatives from the Ontario Ministry of Natural Resources (MNR), MOE, and two federal agencies: Environment Canada (E.C.), and Fisheries and Oceans Canada (DFO).

Legislative and Policy Framework: (Note: all Provincial Statutes and Regulations are available on line at <http://www.e-laws.gov.on.ca> and all Federal Statutes and Regulations are available on line at <http://laws.justice.gc.ca/en/index.html>)

- *Endangered Species Act*: WNV larvicide treatments must take account of potential impacts on species regulated under this provincial legislation.
- *Species at Risk Act*.  
The Act provides legal protection for wildlife species and protects biological diversity through an assessment of species by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). Other sections address requirements for the preparation of recovery strategies, action plans or management plans for species listed in Schedule 1 of the Act (as applicable) and requirements to conduct environmental assessments.
- Accord for the Protection of Species at Risk in Canada: As a signatory to this (1996) agreement, Ontario has made a commitment to participate in a national program that seeks to achieve the protection and recovery of species at risk, and the monitoring of all wild species. Under the Accord, signatories agree, among other things, to “provide protection for the habitat of threatened or endangered species” and to “emphasize preventative measures to keep species from becoming at risk.”  
(On line at [http://www.sararegistry.gc.ca/default\\_e.cfm](http://www.sararegistry.gc.ca/default_e.cfm))

The committee provides a forum for discussion of potential impacts of WNV larvicide treatments on species at risk (SAR). The objective of the committee is to provide the MOE recommendations - which areas are to be treated, and how - that will minimize impacts on SAR.

- *Fisheries Act:*

*Section 36:* The use of larvicides or other pesticides in areas considered to be waters frequented by fish, or fish habitat or in places where they are likely to enter waters frequented by fish or fish habitat can be considered as deposit of deleterious substances under Subsection 36(3) of the *Fisheries Act*. Section 36 would apply to wetlands designated to be fish habitat.

Environment Canada has indicated that, in the context of Section 36(3) of the *Fisheries Act*, *Bti* or *B. sphaericus* is not currently considered to be a deleterious substance.

*Section 35:* Subsection 35(1) prohibits works or undertakings that result in the harmful alteration, disruption or destruction of fish habitat (HADD), unless authorized by the federal Minister under section 35 (2).

NOTE: section 35 is pertinent to any proposal that would physically impact fish habitat (i.e., filling in wetlands or creeks, etc.), as opposed to larvicide applications, which are subject to section 36.

Implementation of section 35 is a cooperative effort involving a number of federal and provincial agencies, including the Department of Fisheries and Oceans, Environment Canada, conservation authorities, MNR and MOE. DFO is responsible for protecting habitats that contribute directly or indirectly to Canada's fisheries resources. If a HADD of Canadian fisheries waters (a creek, lake or littoral wetlands) is proposed, DFO should be consulted either directly or through the local conservation authority. DFO-conservation authority agreements assist in providing a streamlined approach to regulatory approvals.

Note that the determination of whether or not a given area would be considered as Canadian fisheries waters is not always straightforward. Back yard ponds and roadside ditches typically are not considered to be such, and therefore are of less concern.

If additional information is required, Medical Officers of Health and other provincial and local officials are encouraged to contact regional officials of DFO and EC. The Pest Management Regulatory Agency (PMRA) is the lead federal agency regulating the use of pesticides, and should also be involved in discussions.

- EC's regional offices are listed on the following website: <http://www.ec.gc.ca/default.asp?lang=En&n=DA294545-1#offices>
- DFO's contacts are listed by region on the following website: [http://www.dfo-mpo.gc.ca/Contact\\_e.htm#2](http://www.dfo-mpo.gc.ca/Contact_e.htm#2)

## MNR REVIEW PROCESS

1. MOE advises appropriate MNR District Office, upon receipt of an application to apply *Bti* or *B. sphaericus* in a Sensitive area. MOE is responsible for providing MNR with information on the Sensitive area to be treated (name and location), and proposed *Bti* or *B. sphaericus* treatment schedule.
2. MNR District staff accesses the Natural Heritage Information Centre's (NHIC) Natural Areas Database to determine if any endangered, threatened or otherwise "sensitive" species are known to be present in the Sensitive area. MNR District staff compares information in the NHIC database to the list of sensitive species for WNV larvicide application.

The sensitive species list will be updated as required as the evaluation and listing/regulation of species at both provincial and national/federal levels is an ongoing process.

3. MNR will examine the proposed larviciding location to determine whether it impacts on fish sanctuaries. Responsibility for fish habitat protection rests with DFO and a contact name for DFO referral will be provided by MNR. See Appendix 7 for definitions of each of these sensitive areas.
4. If a species of concern is found within the Sensitive area, MNR's Biodiversity Section, and the Natural Heritage Information Centre, can provide advice on potential impacts/referrals to other experts. A site visit may help facilitate the review process.
5. MNR District staff forwards the results of their review, in confidence, to the inter-agency committee and arranges a meeting or conference call to review the information if needed.
6. MOE, with input from MNR, provides a written summary to all participants of the decisions made.

**Appendix 11**  
**Summary Report Templates**

## West Nile Virus Summary Report Template Treatments to Catch Basins with Methoprene or *B. sphaericus*

The following summary report example is based upon just two rounds of treatments to catch basins in three different sites issued under one approved permit. Please use this template to provide the information requested below and fill out all fields of this report.

**Permit Number:** 3567-62QJG1 (include on all pages of this document)

**Date:** November 30, 20\_\_

### 1.0 Contact Information

**Name:** Fred J. Wright  
**Tel. No.:** 905-123-4567  
**Fax No.:** 905-899-1547  
**Email:** [fred.wright@home.ca](mailto:fred.wright@home.ca)

### 1.1 Exterminator Information

**Name:** Fred J. Wright  
**Licence Number:** 80-01-4568

### 2.0 Pesticide Information and Total Amount Used under Permit - Permit No. 3567-62QJG1

Pesticide Product Name	Reg. No.	Amount Allowed under Permit	Total Amount Used for all Treatments <sup>(1)</sup>	Total No. of Catch Basins Allowed to be Treated per Round Under Permit	Actual No. of Catch Basins Treated per Round	Rate of Application
Altosid Pellets	21809	4.48 kg	4.20 kg (1)	3200	3023 - Round 1 2973 - Round 2	0.7g /cb
Altosid Briquets	27694	50	50	50	50	1 briquet/cb
Vectolex WSP	28009	100	100	100	100	1 pouch/cb

<sup>(1)</sup> Total amount used for all treatments is calculated as follows:

Total catch basins treated in round 1 (3023) x 0.7 = 2116.1 g /1000 = 2.12 kg

Total catch basins treated in round 2 (2973) x 0.7 = 2081.1 g /1000 = 2.08 kg

2.12 + 2.08 = 4.2 kg

### 3.0 Catch Basins Treated

Round #1 July 1<sup>st</sup> – 21<sup>st</sup>

Permit No. 3567-62QJG1

Community/ Town/ Area Identified by Permit	Catch Basins Treated		
	Pellets	Briquets	Pouches
Oneville	1890	-	-
Twotown	463	-	-
Threeburg	670	-	-
<b>TOTAL</b>	<b>3023</b>	<b>-</b>	<b>-</b>

Round #2 August 1<sup>st</sup> – 21<sup>st</sup>

Permit No. 3567-62QJG1

Community/ Town/ Area Identified by Permit	Catch Basins Treated		
	Pellets	Briquets	Pouches
Oneville	1800	25	25
Twotown	463	25	25
Threeburg	710	-	50
TOTAL	2973	50	100

**4.0 Type of Public Notification Used (\* Include a copy with this report and if a written notice was used indicate how it was distributed)**

Newspaper\*  Written Notice\*  A non-residential area notice sign that complied with Appendix 2 option 3 of the West Nile Virus Permit Applicant Guide was used for public notification.

A copy of the dated newspaper notice has been appended to this summary report

**5.0 Incidents Reported to Spills Action Centre (SAC)**

There were \_\_\_ incidents during the larvicide applications that required SAC to be notified. Provide specific details of any incidents.

**6.0 Universal Transverse Mercator (UTM) projection or Map locations**

(Submit UTM co-ordinates or marked Maps with the location of the treatment areas and sensitive areas)

**West Nile Virus Summary Report**  
**Treatments to Surface Water with methoprene, Bti or *B. sphaericus***

The following summary report example is based upon one round of treatment to surface waters in three different sites using four different larvicide products issued under one approved permit. Please use this template to provide the information requested below and fill out all fields of this report.

**Permit Number:** 3589-62IPZ2 (include on all pages of this document)

**Date:** November 30, 20\_\_

**1.0 Contact Information**

**Name:** Fred J. Wright  
**Telephone No.:** 905-123-4567  
**Fax No.:** 905-899-1547  
**Email:** [fred.wright@home.ca](mailto:fred.wright@home.ca)

**1.1 Exterminator Information**

**Name:** Fred J. Wright  
**Licence Number:** 80-01-4568

**2.0 Pesticide Information and Summary for all Treatments Permit No. 3589-62IPZ2**

Pesticide Product Name	Reg. No	Amount Allowed under Permit	Amount & Rate Used for all Treatments	Total Area (ha) Allowed under Permit	Total Area (ha) Treated	*Maximum number of treatments
Vectobac 200G	18158	200 kg	180 kg 10 kg/ha	20	18	1
Aquabac 200G	26863	200 kg	0	20	0	0
Aquabac xt	26860	1.8 L	1.8 L 600 ml/ha	3	3	1
Vectolex CG	28008	67.2 kg	50.4 kg 16.8 kg/ha	4	3	1
Altosid Liquid Larvicide	28070	0.146 L	0.110 L 73 ml/ha	2	1.5	1

\*Maximum number of treatments is the greatest number of treatments applied to any individual location.



### 3.0 Treatment locations [a separate chart must be provided for each round

Round #1 July 1<sup>st</sup> – 7<sup>th</sup>

Permit No. 3589-62IPZ2

Name and Reg. No. of Product Used	Site Identified on Permit	Total Area Treated (ha)	Total Amount of Product Applied	Rate Applied
Vectobac 200G 18158	Oneville	15.5	155 kg	10 (kg/ha)
	Twotown	2	14 kg	7 (kg/ha)
	Threeburg	0.5	4 kg	8 (kg/ha)
Totals		18	173 kg	
Aquabac 200G 26863	Oneville	0	0	-
	Twotown	0	0	-
	Threeburg	0	0	-
Totals		0	0	
Aquabac xt 26860	Oneville	3	1.8 L	600 ml/ha
	Twotown	0	0	-
	Threeburg	0	0	-
Totals		3	1.8 L	
Vectolex CG 28008	Oneville	3	50.4 kg	16.8 kg/ha
	Twotown	-	-	-
	Threeburg	-	-	-
Totals		3	50.4kg	
Altosid Liquid Larvicide 28070	Oneville	0.75	0.07 L	73 mL/ha
	Twotown	0.25	0.01 L	-
	Threeburg	0.5	0.03 L	-
Totals		1.5	0.110 L	

### 4.0 Pre and Post Larvicide Monitoring Information

*Retain Larvae monitoring forms for two years. Monitoring forms will be provided to the MOE by request only. Complete and retain the Summary Table*

#### Pre-Larviciding Sampling Summary for Sensitive Areas/Ditches, Permanent or Temporary Pools and Storm Water Management Ponds (SWMP)

Site Location Address or UTM	Type of Larviciding Program	Date of Monitoring	Pool Rating	Organic Level
115 Rock Rd	Sensitive area - ESA	July 6th	Moderate	Low
12 Steam St	Permanent Pool	July 6th	Moderate	Moderate
258 Oak Crt.	SWMP	July 6th	High	High

#### Post-Larviciding Sampling Summary for Sensitive Areas

Site Location Address or UTM	Type of Larviciding Program	Date of Monitoring	Pool Rating	Organic Level
115 Rock Rd	Sensitive area -ESA	July 8th	Low	Low

**5.0 Type of Public Notification Used (\* Include a copy with this report and (if a written notice was used indicate how it was distributed)**

- Newspaper\*    Written Notice\*    A non-residential area notice sign that complied with Appendix 2 option 3 of the West Nile Virus Permit Applicant Guide was used for public notification.
  
- A copy of the dated newspaper notice has been appended to this summary report

**6.0 Incidents Reported to Spills Action Centre (SAC)**

There were \_\_\_ incidents during the larvicide applications that required SAC to be notified.  
*(Provide specific details of any incidents)*

**7.0 Universal Transverse Mercator (UTM) projection or Map locations**

*(Submit UTM co-ordinates or marked Maps with the location of the treatment areas and sensitive areas)*