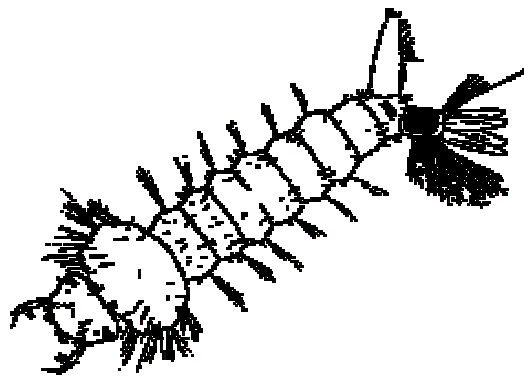


Permit Applicant Guide: Controlling Mosquito Larvae for Prevention and/or Control of West Nile Virus



April 2003

Ontario Ministry of the Environment



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1.0 Introduction

This permit applicant guide outlines the requirements for requesting a permit (See **Appendix 1**) to purchase and use a pesticide (i.e., larvicide to control mosquito larvae) for the prevention or control of West Nile Virus (WNV). 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.

Regulation 914 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.
- a person who owns a property, or a full-time employee of the property owner, to obtain a permit approved by the Director under the Act, authorizing that person to purchase a pesticide. (Note: a permit is not required if the water body which the person intends to treat is wholly located within the boundaries of his or her property and has no direct or indirect outflow, other than by percolation, beyond his or her property boundary).

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 Mosquito Vectors

The proper identification of mosquito species is very important in deciding if a larviciding program should be initiated, and for determining the location and timing of the larvicide applications, in order to disrupt the transmission cycle of WNV.

WNV is spread from bird to bird by *Culex pipiens* or *C. restuans* - mosquito species that feed predominately on birds but will occasionally bite humans and other mammals. In early spring, pre-mated females disperse from overwintering sites in sewers, outbuildings, subterranean enclosures and basements to feed on birds (especially nestlings). Feeding occurs mainly at night when the birds are nesting or roosting high

up in the trees. Female *C. pipiens* or *C. restuans* lay 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. Several overlapping generations of *C. pipiens* or *restuans* may be present from April to early August depending on temperature and rainfall abundance. Female adults that develop in mid to late August do not blood feed before mating and seeking overwintering sites (winter diapause).

WNV appears to be lethal to many birds in the family Corvidae (e.g., American crows and jays) and the presence of WNV-positive dead birds is the first sign that WNV is present and spreading through the local bird population (this is known as epizootic amplification).

Larviciding programs conducted through early spring to mid summer in catch basins and other stagnant water bodies prevent *C. pipiens* and *C. restuans* larvae from developing into adults. This should reduce the number of adult mosquitoes that would otherwise amplify WNV in the bird population.

If birds are dying (e.g., entire families of crows in a single roosting site), it is an indication that WNV is well established in the bird population and, at this point, there is an increased risk that human cases may occur. There is a probability that *Aedes vexans*, an aggressive summer biter of humans, birds and other animals, and other summer mosquito species, could act as “bridge” mosquitoes transmitting WNV from birds to humans. *A. vexans* breeds predominately in temporary pools created by rainfall (e.g., roadside ditches, flooded pastures). Adult mosquitoes are present from May to first frost.

Larviciding programs conducted through late spring to early fall for the treatment of temporary pools, created by rainfall, prevent *A. vexans* larvae from developing into adult mosquitoes. This should reduce the number of adult mosquitoes and lower the risk of humans developing WNV from biting mosquitoes.

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 Regulation 914. Pest control products are classified into one of six different classes or “schedules”. The schedule 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. For current information on classified products, consult the Ontario Pesticides Advisory Committee web site and link to the PEPSIS data base at www.opac.gov.on.ca.

Appendix 3 provides a list of currently classified larvicides for commercial use under permit for WNV.

4.0 Municipal WNV Prevention and/or Control Programs

A municipality has the authority to conduct a larviciding program only on municipal-owned land or on land where an easement exists for the purpose of drainage management. These control programs would likely be initiated under an MOH directive or request for preventative mosquito control. In order to expand the larviciding program onto private land, the municipality must obtain written permission of the private land owner or a health hazard order must be issued, covering private land, by the local Medical Officer of Health under Section 13 of the *Health Protection and Promotion Act*. A permit application that is supported by a health hazard order, issued by the local MOH, will be considered as a very high priority.

A permit application may be submitted by an agency (e.g., municipality, parks commission) or a licensed exterminator contracted by an agency with the written support of, or order from the Local Medical Officer of Health.

MOE encourages early (preventative) submission of completed permit forms and supporting documentation by either a municipality or licensed exterminator on behalf of the municipality. Submissions will be reviewed and considered for approval subject to appropriate conditions appended to the permit.

4.1 Surveillance

Dead bird surveillance, adult mosquito trapping, larvae surveys and mapping are very important for determining the need for larviciding programs. Municipal Health Units are encouraged to conduct surveillance and monitoring programs. If not already done in the previous year, municipal Health Units should begin in early spring to conduct dead bird and adult mosquito trap surveillance and larvae mapping to determine if a larviciding program is warranted.

4.2 Licensing Requirements

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 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. A municipality or other agency that intends to use a larvicide on its own property is not required to obtain an Operator's licence if full-time employees are appropriately licensed for the use of larvicides.

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

- Mosquito/Biting Flies (a Water Class 2 or Water Class 3 is equivalent) for ground equipment application of a larvicide
- Aerial (a Land Class 7 is equivalent) for aircraft application of a larvicide

4.3 Permit Application Submission

Municipalities (or other jurisdictions) may decide to submit a permit application in order to conduct larviciding programs based upon dead bird and mosquito surveillance activities.

Permit applications and support documents for larviciding should be submitted separately for any of the following four types larviciding programs in urban areas:

A. Catch basins/storm drains:

- Methoprene 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 m². Catch basins with an average surface water area greater than 0.6 m² would receive proportionately more of the methoprene pellets.
- 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, on standing water in the sewer. This would be determined by a pre-treatment inspection (see **Appendix 7**). 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 7** for detailed information on determining application rates.

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

- *Bacillus thuringiensis* var. *israeliensis* (*Bti*) products will be considered for application in ditches and temporary pools or permanent pools including storm

water management ponds since these water bodies may support non-target aquatic organisms (methoprene may have an impact on these organisms whereas *Bti* is very specific to mosquito larvae).

- The rate of application will be determined by the larval instar stage, target species etc. as indicated on product labels.

C. Sewage and sludge storage lagoons

- Methoprene 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.

D. Wetlands:

- *Bacillus thuringiensis var. israeliensis (Bti)* products will be considered for permit approval in wetlands since these water bodies support non-target aquatic organisms (methoprene may have an impact on these organisms whereas *Bti* is very specific to mosquito larvae).
- The rate of application will be determined by the larval instar stage, target species, etc., as indicated on product labels.

4.4 Permit Submission Checklist

An 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:

- A completed permit application form (see **Appendix 1**). If it is not possible to provide the name, licence number and business information (including the Operator's licence number if applicable) of the licensed exterminator responsible for carrying out the larviciding program (i.e., water extermination), this may be submitted seven (7) days prior to the initiation of larviciding.
- A copy of a letter from a representative of a town, city, etc., within the jurisdiction of a Regional Municipality authorizing the use of a larvicide in that town, city, etc. by the Regional Municipality.
- A copy of an order under the *Health Protection and Promotion Act* or a letter of support from the Local Medical Officer of Health (MOH) indicating:
 - A mosquito larviciding program is considered necessary or appropriate to reduce *Culex pipiens* larvae and prevent the epizootic amplification of WNV, based upon 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 *Aedes vexans* or other mosquito species that may act as a bridge 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.

- Letters of permission from private property owners authorizing the use of a larvicide on their property (for example: if a catch basin or ditch is on private land and no municipal easement allowance is in place).

- Standard municipal CAD/GIS maps or Ontario Base maps (1:10,000 scale is recommended for Southern Ontario - 1 cm on the map represents 100 metres and 1:20,000 scale for Northern Ontario - are available at <http://www.maps.mnr.gov.on.ca/catalog/index.htm>) showing:
 - The approximate number, average size and location of water bodies (e.g., catch basins, ditches, ponds, lagoons, wetlands, etc.) to be treated with a larvicide. (**NOTE: if a municipality does not have sufficient mapping information to show exact map locations of all catch basins, ditches or pools that are proposed for treatment with a larvicide then MOE will accept a statement that “x” number of catch basins, ditches, pools, etc., are planned to be treated within a marked boundary location on the maps submitted - the approved permit conditions will require that the exact location of all treated catch basins be provided with the final report**).
 - The location of all nearby Sensitive Areas (see **Appendix 6** for definitions) that may be impacted by the larvicide in the event of off site movement.
 - For catch basins** - Sensitive areas include:
 - ▶ fish bearing waters, including hatchery areas, sanctuaries and critical fish habitat and fish farms adjacent or downstream of the discharge
 - For ditches and temporary or permanent pools** - Sensitive areas include:
 - ▶ fish bearing waters, including hatchery areas, sanctuaries and critical fish habitat and fish farms
 - ▶ marshes, bogs, swamps, fens or other wetlands
 - ▶ aquatic species at risk (e.g., endangered or threatened)
 - ▶ headwater areas
 - ▶ irrigation water sources
 - ▶ potable and livestock water supplies
 - ▶ areas where human recreational water activities may occur
 - For sewage and sludge lagoons** - Sensitive areas not applicable
 - For wetlands** - Sensitive areas include:
 - ▶ fish bearing waters, including hatchery areas, sanctuaries and critical fish habitat and fish farms
 - ▶ marshes, bogs, swamps, fens or other wetlands
 - ▶ susceptible crops/organic farms or crops grown in marsh areas (e.g., cranberries, wild rice, etc.)

- ▶ aquatic species at risk (e.g., endangered or threatened)
 - ▶ headwater areas
 - ▶ irrigation water sources
 - ▶ potable and livestock water supplies
 - ▶ areas where human recreational water activities may occur
- A description of measures that will be used to protect Sensitive areas from potential impact due to movement of the larvicide from the target area.
- Monitoring data - See **5.0** below for **required** pre and post larviciding monitoring data and **6.0** for **recommended** monitoring procedures.

5.0 MOE Permit Requirements for Monitoring

A textual description of 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 - See section **6.0** below for monitoring recommendations.

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

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 higher label rate) and larval instar stage (e.g., lower label rate for 1st and 2nd instars; higher label rate for 3rd and 4th instars) in order to apply *Bti* at the proper label rate.

Appendix 4 provides a guidance for *Bti*. efficacy monitoring for pre and post larviciding.

C. Sewage or Sludge lagoons using methoprene:

- No efficacy monitoring requirements - See section **6.0** below for efficacy monitoring recommendations.

D. Wetlands using *Bti*:

MOE **requires** that:

- Pre-larviciding monitoring be conducted to determine degree of organic material content and larval instar stage in order to apply the proper label rate of *Bti*.
- Post-larviciding monitoring of 10 typical sites (minimum) to determine larvae dead

vs. alive within 24 - 48 hours after treatment.

Appendix 4 provides a guidance for *Bti*. efficacy monitoring for pre and post larviciding.

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 that:

- Pre-larviciding monitoring be conducted in catch basins to determine larvae counts and evaluate a need to apply methoprene.
- Post-larviciding monitoring be conducted in 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 5**).

MOE suggests that a minimum of 30 catch basins proposed for treatment with a larvicide be randomly selected and monitored for methoprene efficacy.

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

MOE recommends that:

- Post-larviciding monitoring be conducted in ditches and temporary or permanent pool to determine dead vs. live larva counts within 24 - 48 hours after treatment with *Bti*.

MOE suggests that post-larviciding monitoring should include at a minimum, several ditches, temporary pools and permanent pools, sampled around the margins at several points.

C. Sewage or Sludge lagoons using methoprene:

MOE recommends that:

- Pre-larviciding monitoring at 10 points around the perimeter be conducted in sewage or sludge lagoons to determine larva counts and evaluate a need to apply methoprene.
- Post-larviciding monitoring at 10 points around the perimeter be conducted in sewage or sludge lagoons to determine pupal development to adult (refer to the methoprene product guide literature or the guidance for methoprene efficacy monitoring provided in **Appendix 5**).

D. Wetlands using *Bti*:

See requirements in section 5.0 above.

7.0 Permit Conditions

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

The following conditions may be placed on approved permits:

- Larvicide purchase is limited to a licenced exterminator (Mosquito/Biting Flies for ground-based application or Aerial for aircraft application) who must store the larvicide in accordance with Sections 119 - 122 of Regulation 914 under the *Pesticides Act*.
- The transportation of larvicide in vehicles must be in accordance with Sections 126 and 127 of Regulation 914 under the *Pesticides Act*.
- Larvicide use is limited to a licenced 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 Sections 20.1 and 20.2 of Regulation 914 under the *Pesticides Act*) or a licensed exterminator who is considered a Technician in accordance with Section 20.1 (1.1) of Regulation 914 under the *Pesticides Act*.
- The licensed exterminator, who supervises a Technician, must:
 - provide his or her name and licence number to the Technician as the person responsible for supervising the Technician
 - visit the Technician at least once every seven days at the job site to observe the use of the larvicide by the Technician and sign off (signature, licence number and date) in the Technician's log book and/or written instruction documentation for that extermination
 - ensure the Technician has received appropriate training for the larviciding program and that this training is documented at the supervising licensed exterminator's place of business
 - ensure the Technician carries out the extermination according to Regulation 914 and the *Pesticides Act*
- A Technician who applies a larvicide under the supervision of a Mosquito/Biting Flies licence holder must:
 - have at the job site a valid Technician certificate issued by Ridgetown College - University of Guelph, Pesticide Industry Council or Pesticide Industry Regulatory Council, or be the holder of another exterminator's licence
 - have at the job site a document of written instructions with details on how to perform the extermination, safety instructions, etc., and information on the

- ▶ pesticide being used, the PCP No. and target pest
 - ▶ the name and licence number of his or her supervisor who holds a Mosquito/Biting Flies licence
 - ▶ maintain a log book or other documentation that provides a record of the once every 7 days site visits by the supervising licensed exterminator over the past 30 days
- This permit is approved for 2003 only.
- Larvicide must be applied according to label directions.
- Larvicide must be placed into catch basins through the grate and must not be applied to catch basins if there is sufficient water flow, such as during heavy rainfall that does not allow for the proper settlement of the larvicide in the bottom of each catch basin.
- The Spills Action Centre (SAC) must be notified by telephone [1-800-268-6060] at least 48 hours before the 2003 larviciding program begins, and immediately if there is any change in the information that was provided, advising SAC of the name of:
 - ◇ the contact person and his or her telephone number who is responsible at the municipal level for the larviciding program and who can provide specific details about the location and timing of larvicide applications when contacted
 - ◇ the licensed exterminator (and licence number) who is responsible for applying the larvicide
 - ◇ the Operator, his/her licence number and telephone number
- Public notification must 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 West Nile Virus)” [see **Appendix 2**] as follows:
 - A.** Catch Basins - Option 1 **or** 2 must be used
 - B.** Ditches, temporary or permanent pools including storm water management ponds - Option 3 **and** either 1 **or** 2
 - C.** Sewage or sludge lagoons - Option 3 **and** either 1 **or** 2
 - D.** Wetlands - Option 3 **and** either 1 **or** 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 pesticide to the local Ministry of the Environment 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 must be provided by December 1st of the year to the Regional Pesticides Specialist that includes:
 - ▶ a map indicating the locations of all treated catch basins and their discharge points, and specific location of all applications of a larvicide to ditches and temporary or permanent pools including storm water management ponds or wetlands.

- ▶ the total number of treated catch basins, ditches and temporary or permanent pools including storm water management ponds or wetlands and dates of all treatments.
 - ▶ letters of permission from private property owners who were not included with the support documentation.
 - ▶ the name of the pesticide used, *PCP* number, rate of application and quantities used in **each** water body.
 - ▶ copies of the actual newspaper or written notices used for public notification.
 - ▶ reference to any incidents or situations involving the use of the pesticide during the larvicide program that was reported to the District MOE office or SAC.
 - ▶ Completed pre and post larviciding efficacy monitoring forms [see **Appendix 4 and 5**] for each water body if required - see section **5.0** above for MOE requirements.
- Additional conditions may be provided on a case by case basis.

Table 1
Ontario Ministry of Environment - Regional Pesticide Specialists

REGION County/Township	PESTICIDE SPECIALIST(S) Mailing Address	Telephone/Toll Free/Fax
Central Region Toronto, Halton, Peel York and Durham	Cathy Wright 5775 Yonge St, 8th Floor Toronto, Ontario M2M 4J1	(416) 326-3477 Toll Free 1-800-810-8048 Fax (416) 325-6347
West-Central Region Haldimand, Norfolk, Niagara, Hamilton-Wentworth, Dufferin, Wellington, Waterloo, Brant	Charlie Roland Suzanne Howe 119 King St. West, 12th Floor Hamilton, Ontario L8P 4Y7	(905) 521-7658 (905) 521-7551 Toll Free 1-800-668-4557 Fax (905) 521-7820
Eastern Region Frontenac, Hastings, Lennox & Addington, Prince Edward, Leeds & Grenville, Prescott & Russell, Stormont/Dundas & Glengarry Peterborough, Victoria, Northumberland, Renfrew, Ottawa- Carleton, Lanark, District of Nipissing (Twsp. of Airy, Murchison, Dickens, Lyell and Sabine), Haliburton	Roberto Sacilotto 133 Dalton Avenue Kingston, Ontario K7L 4X6	(613) 549-4000 ex 2684 Toll Free 1-800-267-0974 (In Eastern Region only) Fax (613)548-6908
Southwestern Region Elgin, Middlesex, Oxford, Essex, Kent, Lambton, Bruce, Grey, Huron, Perth, Muskoka, Simcoe	Gary Roberts 733 Exeter Rd., London, Ontario N6E 1L3	(519) 873-5047 Toll Free 1-800-265-7672 Fax (519) 873-5020
Northern Region (east) Manitoulin, Nipissing, Parry Sound, Sudbury, Algoma (East), Timiskaming, Sault Ste. Marie	John Negusanti 199 Larch Street, Ste 1101 Sudbury, Ontario P3E 5P9	(705) 564-3249 Toll Free 1-800-890-8516 Fax (705) 564-4180
Northern Region (west) Algoma (West), Cochrane, Kenora, Rainy River, Timmins, Thunder Bay	Don Mitchell 435 James St. S., Suite 331 Thunder Bay, Ontario P7E 6S7	(807) 475-1712 Toll Free 1-800-875-7772 Fax (807) 475-1754

Spills Action Centre - 1-800-268-6060

Appendix 1

Permit Application Form 7

MOE requests that the permit application be completed and signed by an appropriately licensed exterminator who is responsible for the larviciding program.

Complete all parts of the application form except those sections which are shaded:





Application For A Permit To Purchase A Pesticide And/Or Perform A Water Extermination / Demande de permis d'achat d'un pesticide ou de destruction de parasites aquatiques

Personal information requested on this form is collected under the authority of the Pesticides Act, RSO, 1990, Ontario Regulation 914. It is used to evaluate applications for permits to use restricted pesticides according to the requirements of the Pesticides Act. Questions should be directed to your nearest Ministry of the Environment Regional Office. / Les renseignements personnels demandés dans le présent formulaire sont recueillis en vertu du Règlement 914 de l'Ontario pris en application de la Loi sur les pesticides, L.R.O. 1990. Ils serviront à évaluer les demandes de permis d'utilisation de pesticides à usage restreint selon les exigences de la Loi. Veuillez adresser toute question au bureau régional ou au bureau de district de ministère de l'Environnement de votre région.

Applicant Information / Renseignements sur l'auteur de la demande

Name of property owner / Nom du propriétaire	Home tel. no. / Tél. dom.	Business tel. no. / Tél. bur.
Mailing address / Adresse postale		Postal code / Code postal

Pesticide and Site Information / Données sur les pesticides et la zone à traiter

Name of pest / Nom du parasite	Area to be treated (attach a map and indicate access route) / Zone à traiter (joindre une carte et y indiquer la route d'accès)	If for blackfly treatment / Lutte contre les mouches noires	
Name of pesticide / Nom du pesticide		Stream flow / Débit du cours d'eau	<input type="text"/>
Pest Control Products Act No. / N° d'enregistrement		Current speed / Vitesse du courant	<input type="text"/>
Active ingredient(s) / Ingrédient(s) actif(s)	Length (frontage) / Longueur (façade)	<input type="text"/>	
	Width / Largeur	<input type="text"/>	
	Depth (average) / Profondeur (moyenne)	<input type="text"/>	
	Name of body of water / Nom de l'étendue d'eau	Lot	Concession
	Township / Canton	District/County/Municipality / District/comté/municipalité	
Type of application / Méthode d'application	Water in the vicinity of the treated area is to be used for / Utilisations de l'eau aux alentours de la zone traitée		
<input type="checkbox"/> Ground / terrestre	<input type="checkbox"/> Swimming / Natation	Fishing (specify) / Pêche (préciser)	<input type="checkbox"/>
<input type="checkbox"/> Air / aérienne	<input type="checkbox"/> Drinking / Eau potable		
<input type="checkbox"/> Both / combinée	<input type="checkbox"/> Crop irrigation / Irrigation des cultures	Other (specify) / Autre (préciser)	<input type="checkbox"/>
	<input type="checkbox"/> Livestock watering / Bétail		
	<input type="checkbox"/> Boating / Navigation de plaisance		
Rate Requested / Taxu demandé	Have all adjacent owners, lessees or organizations been notified of the proposed treatment and have they all agreed, realizing use of the water may be temporarily restricted? / Tous les propriétaires, locataires ou organismes adjacents ont-ils été avisés du traitement proposé et ont-ils donné leur accord, sachant que l'utilisation de l'eau pourrait être temporairement limitée?		
Quantity requested / Quantité demandée	<input type="checkbox"/> No / Non		
Date of treatment / Date de traitement	<input type="checkbox"/> Yes, specify who notified them? / Qui les a avisés?		
No. of treatments / N° de traitements	Date of notification / Date de notification		
No. of properties to be treated / N° de propriétés à traiter			
Has a permit been issued previously? / Un permis a-t-il déjà été délégué?	Is the treatment to be done by an exterminator? / Le traitement doit-il être fait par un destructeur de parasites?		
<input type="checkbox"/> Yes / Oui <input type="checkbox"/> No / Non	<input type="checkbox"/> No / Non Yes, indicate below: / Oui, préciser <input type="checkbox"/>		
Last permit no. / N° du dernier permis	Name of exterminator / Nom du destructeur	Tel. no. / Tél.	
Amount of pesticide left over from last treatment / Quantité de pesticide qui reste du dernier traitement	Address / Adresse	Exterminator's licence no. / N° du permis du destructeur de parasites	
	Postal Code / Code postal		

Signature

Signature of property owner or exterminator / Signature du propriétaire ou du destructeur	Date
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For Ministry Use Only / Réserve au Ministère

<p>Permission is hereby granted under the <i>Pesticides Act</i> and Regulations to perform a water extermination: / La présente autorise aux termes de la <i>Loi sur les pesticides</i> et des règlements établis en vertu de celle-ci la destruction de parasites aquatiques:</p> <p><input type="checkbox"/> with the attached amendments/ avec les modifications ci-jointes in accordance with the above application / conformément à la demande ci-dessus <input type="checkbox"/></p> <p>Signature of Director under the <i>Pesticides Act</i> / Signature du directeur désigné en vertu de la <i>Loi sur les pesticides</i></p>	Permit no. / N° de permis
	Expiry date / Date d'expiration
	Date

MOE regional contact / Représentant(e) du bureau de régional du MOE	Ministry of Natural Resources District contact / Représentant(e) du bureau de district - min. des Richesses naturelles
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Appendix 2

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

The following public notification options must be used:

- A. Catch Basins - Option 1 **or** 2.
- B. Ditches, temporary or permanent pools including storm water management ponds - Option 3 **and either** 1 **or** 2
- C. Sewage or sludge lagoons - Option 3 **and either** 1 **or** 2
- D. Wetlands - Option 3 **and either** 1 **or** 2.

Option 1

Publication of a notice in a newspaper of general circulation in the vicinity of the proposed water extermination at least 48 hours before performing the water extermination and, if necessary, repeated monthly and printed such that it is not less than 10 cm in width or the nearest equivalent in column layout.

Option 2

Distribution of a written notice at least 48 hours before performing the water extermination and, if necessary, repeated monthly to all land owners or occupiers or persons in charge of land that is contiguous to and within the application area.

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).
 - ▶ 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.

See the Sample notice below.

Option 3

The posting of a public area sign (rectangular and at least 51 cm high and 38 cm wide) every 100 metres along the perimeter of the treatment area immediately before the

application of the larvicide and remaining for 48 hours. The public area sign must include the following on the front of the sign:

- ▶ red lettering with the words “WARNING” and “PESTICIDE USE”
- ▶ a red circle and red bar over a single black silhouette of an adult person
- ▶ black lettering with the words “FOR INFORMATION CONTACT” and “CALL COLLECT” and a telephone number provided in 1.5 cm high numerals (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
- ▶ black lettering with the words “DATE POSTED” and “DATE SPRAYED” (these dates will be the same since the sign must be posted immediately before larviciding - lettering and numerals must be 1.5 cm high)

The public area sign must include the following on the back of the sign:

- ▶ black lettering with the words “PESTICIDE” and 1.5 cm high lettering to indicate the name of the pesticide used (e.g., Methoprene)
- ▶ black lettering with the words “REGISTRATION NUMBER” and 1.5 cm high numerals to indicate the *Pest Control Products Act* Number of the product
- ▶ black lettering with the words “TO CONTROL” and 1.5 cm high lettering to indicate the pest (e.g., Larva Mosquitoes)
- ▶ A web site may be provided in the bottom 5 cm of the sign

See example and format requirements below.

Sample Notice for Catch basins:

NOTICE OF PESTICIDE USE
Between April 1 to April 30, 2003 the Town of Pleasantville 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 boundaries]. All larvicide will be applied by Ministry of the Environment licensed applicators or trained 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.----- -----.

Example: Public Area Sign - NOT TO SIZE

WARNING



PESTICIDE USE

FOR INFORMATION
CONTACT.....

CALL COLLECT.....

DATE POSTED.....

DATE SPRAYED.....

Public Area Sign

Sign to be 51cm x 38cm (minimum) rain resistant, sturdy to be reused

→Capital **Red** letters 5cm (minimum)

→**Black** single silhouette of an adult person on white background. **Red** circle (outer edge a minimum of 21.5cm in diameter and width one tenth of the diameter) and oblique **red** bar

→Capital **Red** letters 5cm (minimum)

→Capital **Black** letters 1.5cm (minimum) and telephone number of representative or person performing the land extermination; numbers to be 1.5cm in height (minimum)

→Capital **Black** letters 1.5cm (minimum) and long distance telephone number, if applicable; numbers to be 1.5cm in height (minimum)

→Capital **Black** letters 1.5cm (minimum) and, day/month/year of posting, and/or preposting (if applicable) and day/month/year of pesticide application; numbers to be 1.5cm in height (minimum)

→Words or markings that identify the employer of the person performing the land extermination or that identify the owner/ occupier or person in charge and that do not detract from the sign; not to occupy more than bottom 5cm of the sign

PESTICIDE.....

→Capital **Black** letters 1.5cm (minimum) and pesticide name; letters to be 1.5cm in height (minimum)

REGISTRATION
NUMBER.....

→Capital **Black** letters 1.5cm (minimum) and *Pest Control Products Act* No. (PCP No.) or *Fertilizers Act* No. (FA No.); numbers to be 1.5cm in height (minimum)

TO CONTROL.....

→Capital **Black** letters 1.5cm (minimum) and name of pest; letters to be 1.5cm in height (minimum)

→Words or markings that identify the employer of the person performing the land extermination or that identify the owner/ occupier or person in charge and do not detract from the sign, or additional words or markings that have been approved in writing by the Director under the *Act*; not to occupy more than bottom 5cm of the sign

Appendix 3

Mosquito Larvicides Currently Federally Registered and Classified for Commercial Use In Ontario under permit for WNV

PCP No.	PRODUCT NAME ACTIVE INGREDIENT	AERIAL* (Yes/ No)	REGISTRANT/AGENT ADDRESS	ONT. SCH.
18158	Vectobac 200G Biological Larvicide Bacillus thuringiensis Serotype H-14 (0.2 ITU/L)	Y	Valent Biosciences Canada Ltd. 2100-40 King St. W. Scotia Plaza Toronto, ON, M5H 3C2	2
19239	Teknar Granules Larvicide for Mosquitoes Bacillus thuringiensis Serotype H-14 (260 AAU/mg)	Y	Thermo Trilogy Corporation 175-9145 Guilford Rd. Columbia, MD 21046-1883	2
19241	Teknar HP-D Larvicide for Mosquitoes/ Black-fly control Bth 3000 AU/mg	Y	Thermo Trilogy Corporation 175-9145 Guilford Rd. Columbia, MD 21046-1883	2
19455	Vectobac 600L Biological Larvicide Bacillus thuringiensis Serotype H-14 (0.6 ITU/L)	Y	Valent Biosciences Canada Ltd. 2100-40 King St.W. Scotia Plaza Toronto, ON M5H 3C2	2
19466	Vectobac-200g Biological Larvicide Bth 200 ITU/mg	N	Valent Biosciences Canada Ltd. 2100-40 King St. W. Scotia Plaza Toronto, ON M5H 3C2	3
21062	Vectobac 1200L Biological Insecticide Bt Serotype H-14 (1.2 BIU/Kg)	Y	Valent Biosciences Canada Ltd. 2100-40 King St. W. Scotia Plaza Toronto, ON M5H 3C2	2
21809	Altosid Pellets Methoprene 4.25%	Y	Wellmark Int. P.O Box 20040, Woodlawn Postal Outlet Guelph, ON N1H 8H6	2
22676	Altosid Granules Methoprene 1.5%	Y	Wellmark Int. P.O Box 20040, Woodlawn Postal Outlet Guelph, ON N1H 8H6	2
26860	Aquabac xt Bt Serotype H-14 (1200 ITU/mg)	Y	AFA Environmental Inc. 1100 Rene Levesque Blvd. West, 25th Floor Montreal, QC H3B 5C9	2
26862	Aquabac 200G Bt Serotype H-14 (200 ITU/mg)	N	AFA Environmental Inc. 1100 Rene Levesque Blvd. West, 25th Floor Montreal, QC H3B 5C9	3
26863	Aquabac 200G Bt Serotype H-14 (200 ITU/mg)	Y	AFA Environmental Inc. 1100 Rene Levesque Blvd. West, 25th Floor Montreal, QC H3B 5C9	2

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.

GUIDANCE FOR *BACILLUS THURINGIENSIS* var. *ISRAELIENSIS* (Bti) EFFICACY MONITORING

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

BREEDING SITE DESCRIPTION
Site Type (Check one): Roadside Ditch __ Right-of-Way Ditch __ Woodland Pool __ Field Pool __ Dugout __ Culvert __ Slough __ Pond __ Rock Pool __ Tree Hole __ Marsh __ Swamp __ Fen __ Bog __ Storm Management Pond __ Other Type of Surface water Site _____
Organic level of water: low __ moderate __ high __ Water Temperature: _____
Pool Length (m): _____ Width (m): _____ Depth (m): _____ Emergent Vegetation: Nil __ Low __ Mod. __ High __

PRE-LARVICIDING SEQUENTIAL SAMPLING			Pool rating*: Nil __ Low __ Moderate __ High __ (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**

- If no larvae are collected, the site is rated as "nil".
 - If only 1 or 2 larvae are collected in 10 dips, this site is rated as "low".
 - If 7-30 larvae are collected in 10 dips, this site is rated as "moderate".
 - If >31 larvae are collected in 10 dips, this site is rated as "high".
 - 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 m²), then the number of dips taken must 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		

GUIDANCE FOR METHOPRENE EFFICACY MONITORING

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

BREEDING SITE DESCRIPTION	
Site Type (Check one): Catch Basin/Storm Drain <input type="checkbox"/> Sewage Lagoon <input type="checkbox"/> Sludge Lagoon <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"/> Mod. <input type="checkbox"/> High <input type="checkbox"/>

PRE-LARVICIDING SEQUENTIAL SAMPLING			Pool rating*: Nil <input type="checkbox"/> Low <input type="checkbox"/> Moderate <input type="checkbox"/> High <input type="checkbox"/> <small>(see below)</small>		
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

- If no larvae are collected, the site is rated as "nil".
 - If only 1 or 2 larvae are collected in 10 dips, this site is rated as "low".
 - If 7-30 larvae are collected in 10 dips, this site is rated as "moderate".
 - If >31 larvae are collected in 10 dips, this site is rated as "high".
 - 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 m²), then the number of dips taken must 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>Coquillettia pertubans</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	
<ol style="list-style-type: none"> Collect pupae once a week from a treated catch basin and from a nearby untreated catch basin (if available) Place the pupae in a covered styrofoam coffee cup or soup container (half-filled with distilled water) and cover with netting or screening. Check for emergence after two days. Count the number of dead pupae (DP), dead adults (DA) and alive adults (AA). Use the following formula to determine the % control = (DP+DA) ÷ (DP+DA+AA) x 100 Record results in an Excel spreadsheet format to facilitate calculations (see example below) <p>Most catch basins should show >95% control for up to 30 days using methoprene pellets. Some 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.</p>	

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 6 Sensitive Areas Definitions

SENSITIVE AREA is defined as a critical fish habitat, e.g., spawning areas, wetlands, headwaters, migration areas, nursery areas, intermittent streams that provide spawning habitat for fish; fish sanctuaries; fish hatcheries; stocked lakes and rivers; endangered species habitat; patented land.

SENSITIVE AREAS REQUIRING PROTECTION - DEFINITIONS

CRITICAL FISH HABITAT: Is habitat judged to be of critical importance to the maintenance of a healthy fish population (includes: feeding areas, migration areas; nursery areas; spawning areas).

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 marshes, bogs, swamps, fens, etc.

HEADWATER AREA: Is the area starting at the lake highest up in the watershed which requires protection under the guidelines (either greater than 10 ha or with a known fisheries value) and continues up each inflow to this lake until the top of the stream occurs, or there is a wetland, lake or beaver pond with significant retention capacity.

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, which is published by the Ministry of Natural Resources at <http://www.mnr.gov.on.ca/MNR/fishing/gen.html>.

FISH HATCHERY: Is a designated area of fish rearing.

ENDANGERED SPECIES HABITAT: Is the sum total of environmental conditions of a specific place occupied or potentially occupied by an endangered species (as designated in Regulations of the *Ontario Endangered Species Act*) or a population of such species.

HUMAN HABITATION: Areas of human habitation such as day care centres, schools, senior citizen homes, hospitals, etc.

Appendix 7

Assessing Catch Basins to Determine Application Rate

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 m². 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.

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:

Assume the catch basin has a 0.45 m radius.

Formula Used

Area (circle) = πr^2 (pi x radius squared)

where $\pi = 3.14159$

Area of Standard Catch Basin

Area of standard catch basin is $3.14159 \times 0.45 \text{ m} \times 0.45 \text{ m} = \underline{0.636 \text{ m}^2}$

Application Rates based on methoprene pellets:

Label rate states - 5.6 -11.2 kg/ha or 0.56 -1.12 g/m² of water surface, then

Low application rate = $0.636 \text{ m}^2 \times 0.56 \text{ g/m}^2 = \underline{0.356 \text{ g}}$

High application rate = $0.636 \text{ m}^2 \times 1.12 \text{ g/m}^2 = \underline{0.712 \text{ g}}$

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, $1.04 \text{ g/1 cc} = 0.712 \text{ g/'x' cc}$; therefore, 'x' = 0.69 cc

Because 1 teaspoon = 5 cc

0.69 cc = ~ 0.14 teaspoons

Therefore, 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.