Pest Management Regulatory Agency
Agence de réglementation de la lutte antiparasitaire

Proposed Acceptability for Continuing Registration

PACR2004-32

Re-evaluation of the Polyhedral Inclusion Bodies (PIBs) of *Orgyia pseudotsugata* Nucleopolyhedroviruses (OpNPVs)

The purpose of this document is to inform registrants, pesticide regulatory officials and the Canadian public that the Pest Management Regulatory Agency (PMRA) has completed a re-evaluation of the polyhedral inclusion bodies (PIBs) of *Orgyia pseudotsugata* (Douglas fir tussock moth) nucleopolyhedroviruses (OpNPVs). The PMRA has determined that the PIBs of OpNPVs are acceptable for continued registration provided that the proposed mitigation measures are adopted. Additional data requirements are identified. Upon the finalization of the re-evaluation decision, the PMRA will provide the registrants of products containing PIBs of OpNPVs with specific direction on how to address these measures and requirements.

This Proposed Acceptability for Continuing Registration (PACR) document provides a rationale for the proposed regulatory decision for the PIBs of OpNPVs. The PMRA will accept written comments on this proposal up to 45 days from the date of publication of this document. Please forward all comments to the Publications Coordinator at the address below.

(publié aussi en français)

6 August 2004

This document is published by the Alternative Strategies and Regulatory Affairs Division, Pest Management Regulatory Agency. For further information, please contact:

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www.hc-sc.gc.ca/pmra-arla/
Information Service:
1 800 267-6315 or (613) 736-3799
Facsimile: (613) 736-3798

ISBN: 0-662-37864-4 (0-662-37865-2)
Catalogue number: H113-18/2004-32E (H113-18/2004-32E-PDF)

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1.0 Background

The PMRA is re-evaluating all pesticides, both active ingredients and formulated end-use products (EPs), that were registered prior to 31 December 1994 to ensure that their continued acceptability is examined using current scientific approaches. Regulatory Directive DIR2001-03, *PMRA Re-evaluation Program*, presents the details of the re-evaluation activities and program structure.

The PIBs of OpNPVs have been re-evaluated by the PMRA under Re-evaluation Program 1 as described in DIR2001-03. Under Program 1, the PMRA relies as much as possible on foreign reviews, typically United States Environmental Protection Agency (USEPA) Reregistration Eligibility Decision (RED) documents, to assess Canadian pest control products. For products to be re-evaluated under Program 1, there must exist a suitable foreign review that meets the following conditions:

- it covers the main science areas, such as human health and the environment, that are necessary for Canadian regulatory decisions;
- it addresses the active ingredient and the main formulation types registered in Canada; and
- it is relevant to registered Canadian uses.

Based on the outcome of foreign reviews, the PMRA will propose, under Program 1, a regulatory decision and appropriate mitigation measures for Canadian uses of an active ingredient.

The USEPA conducted a re-evaluation of the PIBs of OpNPVs and concluded that, on the basis of health and environmental risk assessments, they were eligible for reregistration with implementation of mitigation measures. These conclusions were published in a 1996 RED document for PIBs of OpNPVs. In its re-evaluation of the PIBs of OpNPVs, the PMRA based its conclusions on this 1996 RED document, taking into account the Canadian use pattern and Canadian issues (e.g., the federal Toxic Substances Management Policy [TSMP]). A review of characterization of the active ingredient in Canadian products was also conducted.

2.0 Re-evaluation of PIBs of OpNPVs

Common name:	Polyhedral inclusion bodies (PIBs) of Douglas fir tussock moth nucleopolyhedrovirus
Biological name:	Polyhedral inclusion bodies (PIBs) of *Orgyia pseudotsugata* nucleopolyhedrovirus (OpNPV)

Family: *Baculoviridae*

Genus: Baculovirus, subgenus A

In Canada, the PIBs of OpNPVs were first registered in 1983. According to current Canadian EP labels, it is registered with the PMRA for use in forests, woodlands and ornamental use. Currently registered Canadian products containing PIBs of OpNPVs are listed in Appendix I.

The mode of action associated with nucleopolyhedroviruses begins with the ingestion of the PIBs. In the alkaline environment of the insect midgut, the protein matrix is dissolved, thereby releasing the virus particles that infect midgut cells. During the early stages of infection, the infection cycle results in budded viruses that are responsible for systemic spread of the virus within an infected host. At the late stages of infection, virus particles are occluded in the protective protein matrix to form PIBs. Upon the death of the host and the subsequent liquefaction, the PIBs are released into the environment for subsequent ingestion and infection of new hosts. The function of the occlusion body is to protect virions from environmental conditions such as desiccation, thereby prolonging the survival and infectivity of PIBs. Occluded virus particles remain viable in the environment for years, remaining dormant until another susceptible host becomes available. PIBs are, therefore, important for transmission of infection from host to host.

Application rates are slightly higher in Canada than in the United States. The difference between American and Canadian rates is not considered significant, and based on the history of safe use, known target range and lack of known adverse effects, the higher rate is not expected to pose an increased risk to humans, non-target organisms or the environment. Therefore, the conclusions of the USEPA, as described in the 1996 RED document, can be applied to the Canadian use scenario, despite the difference in application rates.

The federal TSMP and Regulatory Directive DIR99-03 were taken into consideration during the review of PIBs of OpNPVs. Products containing PIBs of OpNPVs do not meet TSMP Track 1 criteria because the active ingredient is a biological organism and hence is not subject to the criteria used to define persistence, bioaccumulation and toxicity properties of chemical control products. Furthermore, the active ingredient does not contain any byproducts or microcontaminants that meet the TSMP Track 1 criteria. Impurities of toxicological concern are not expected to be present in the raw materials, nor are they expected to be generated in sufficient quantities during the manufacturing process to present a risk to human health and safety. Also, there are no formulants of toxicological concern present in the TM Biocontrol-1 and Virtuss end-use formulations.

3.0 Proposed re-evaluation decision

The USEPA published a RED document for PIBs of OpNPVs addressing the main science areas that are necessary for Canadian regulatory decisions, i.e., human health and the environment. This document addressed uses of PIBs of OpNPVs that are also registered in Canada. Based on the USEPA RED and Canadian use pattern, the PMRA has determined that PIBs of OpNPVs is acceptable for continued registration provided that the mitigation measures specified in Section 4.0 are adopted. Additional data requirements are identified in Section 5.0. Acceptable uses of PIBs of OpNPVs in Canada are listed in Appendix II.

The PMRA will accept written comments on this proposal up to 45 days from the date of publication of this document to allow interested parties an opportunity to provide input into the proposed re-evaluation decision. Registrants of products containing PIBs of OpNPVs should not apply for label amendments or submit the additional data described in Section 5.0 during this comment period; they will be informed by letter of the specific instructions for addressing label changes and data requirements once the re-evaluation decision has been finalized.

4.0 Proposed regulatory actions

Currently, the technical and EP labels for TM Biocontrol-1 are identical. The registrant must provide separate labels for the technical product (e.g., remove aerial application directions, change classification, change disposal statement). Furthermore, there is no registration or label for the technical grade of the active ingredient (TGAI) used to produce Virtuss. The registrant will be required to submit an application to register the TGAI and a proposed label.

Based on the USEPA conclusions and Canadian use patterns, labels for the technical and EPs should be amended to include the following statements.

(i) On the principal display panel:

- "DANGER – EYE IRRITANT"
- "POTENTIAL SENSITIZER"

In the absence of storage stability data, the labels must also include a date of manufacture and a statement indicating that the products should be stored at 5°C and used within five months.

(ii) On the secondary display panel:

- **Statements of precaution and personal protective equipment** – KEEP OUT OF REACH OF CHILDREN. POTENTIAL SENSITIZER. SEVERE EYE IRRITANT. Avoid contact with skin, eyes and clothing.

Wash thoroughly with soap and water after handling. Wear a long-sleeved shirt and long pants, socks, shoes, protective gloves, dust/mist filtering respirator (MSH/NIOSH approval number prefix TC-21C) or a NIOSH-approved respirator with any –95, R-95, P-95 or HE filter for biological products, as well as eye goggles or face shield during all handling, clean-up and repair activities. Prolonged or frequently repeated skin contact may cause allergic reactions in some individuals. Primary eye irritation studies indicate that the pesticide is a severe eye irritant and may cause irreversible eye damage. An emergency eye flushing apparatus must be present where mixing/loading/application take place. Remove contaminated clothing and wash clothing before re-use.

- **First aid statement** –

IF SWALLOWED:	Rinse mouth and throat with copious amounts of water. Do not induce vomiting.
IF ON SKIN/CLOTHING:	Take off contaminated clothing. Wash skin with plenty of soap and water.
IF INHALED:	Move to fresh air.
IF IN EYES:	Hold eyes open and rinse slowly and gently with water. Remove contact lenses, if present, then continue rinsing eyes. **Get medical attention.**
GENERAL:	Seek medical attention immediately if irritation or signs of toxicity occur and persist or is severe. Take the container, label or product name and Pest Control Product Registration Number with you when seeking medical attention.

- **Toxicological information** – Product is a severe eye irritant, possibly causing irreversible damage to the cornea.

The label for the technical products must include the following statement:

- **Directions for use** – To be used only in the manufacture of a biological insecticide that is registered under the *Pest Control Products Act*.

All other directions for use information and precautionary statements regarding use of EPs must be removed from the label of the technical products.

The label for the EPs must include the following statements:

- **Directions for use** – This product is registered only for the management of Douglas fir tussock moth and shall only be used on forest trees, in woodlands, along rights-of-way, in tree nurseries or seed orchards and in

treed areas of less than half a hectare where high-valued or ornamental trees may be attacked. Do not allow spray mixture to stand in the tank for more than 12 hours.

Avoid spraying sensitive population areas. This pesticide must be applied in a manner to avoid spraying – either directly or indirectly through drift – sites such as residential areas, schools, playgrounds, or similar sites where people or pets may be present.

On the EP label, the following text must be enclosed in a heavy lined box:

NOTICE TO USER: This control product is to be used only in accordance with the directions on this label. It is an offense under the *Pest Control Products Act* to use a control product under unsafe conditions.

NATURE OF RESTRICTION: This product is to be used only in the manner authorized; contact local pesticide regulatory authorities about use permits that may be required.

RESTRICTED USE

Aerial Application Instructions – Apply only by fixed-wing or rotary aircraft equipment that has been functionally and operationally calibrated for the atmospheric conditions of the area and the application rates and conditions of this label. Aircraft should be calibrated to deliver droplets with diameters of 100–250 microns. To ensure a good deposit, applications should only be made under conditions of highest possible relative humidity and low-wind velocity (i.e., in the early morning or early evening when good spray conditions prevail). Label rates, conditions and precautions are product specific. Apply only at the rate recommended for aerial application on this label. Where no rate for aerial application appears for the specific use, this product cannot be applied by any type of aerial equipment.

Ensure uniform application by employing appropriate marking devices.

Use Precautions – Apply only when meteorological conditions at the treatment site allow for complete and even coverage. Apply only under conditions of good practice specific to aerial application as outlined in the *Basic Knowledge Requirements for Pesticide Education in Canada: Applicator Core* and *Aerial Module*, available from the Federal/Provincial/Territorial Committee on Pest Management and Pesticides.

Avoid spraying sensitive population areas. This pesticide must be applied in a manner to avoid spraying – either directly or indirectly through drift – sites such as residential areas, schools, playgrounds, or similar sites where people or pets may be present.

Operator Precautions – Do not allow the pilot to mix the product to be loaded onto the aircraft. Loading of premixed product with a closed system is permitted. It is desirable that the pilot has communication capabilities at each treatment site at the time of application.

The field crew and the mixers/loaders must wear the personal protective equipment described in the PRECAUTIONS section of this label. All personnel on the job site must wash hands and face thoroughly before eating and drinking. Protective clothing, aircraft cockpits and vehicle cabs must be decontaminated regularly.

Product Specific Precautions – Read and understand the entire label before opening this product. If you have questions, call the manufacturer at *(insert toll free telephone number)* or obtain technical advice from the distributor or from your provincial agricultural or forestry representative. Application of this specific product must meet and/or conform to the restricted uses and rates on this label.

Storage and Shelf Life – In order to ensure microbial purity and virus potency, *(insert name of EP)* should be stored in the original container at temperatures below 5°C and used within five months of the date of manufacture. Product stored longer or subjected to elevated temperatures should be returned to the manufacturer for re-evaluation of purity and potency.

The label amendments presented above do not include all label requirements for individual EPs. Additional information on labels of currently registered products should not be removed unless it contradicts the above label statements.

A submission to request label revisions is required within 90 days of finalization of the re-evaluation decision.

5.0 Additional data requirements

The registrant of the PIBs of OpNPVs is required to submit the following within 24 months of finalization of the re-evaluation decision:

- all data (as they relate to the Canadian use pattern) submitted to the USEPA; and

- any additional data necessary to address Canadian requirements for Virtuss. These requirements are consistent with the American requirements for TM Biocontrol-1. Additional information can be found by referring to Regulatory Directive DIR2001-02, *Guidelines for the Registration of Microbial Pest Control Agents and Products*.

The above data and additional data may be required sooner if expansion of current uses of the PIBs of OpNPVs is requested.

6.0 Supporting documentation

PMRA documents, such as DIR2001-03 and DACO tables, can be found on our website at www.hc-sc.gc.ca/pmra-arla. PMRA documents are also available through the Pest Management Information Service. Phone: 1 800 267-6315 within Canada or 1 (613) 736-3799 outside Canada (long distance charges apply); Fax: (613) 736-3798; E-mail: pmra_infoserv@hc-sc.gc.ca.

The federal TSMP is available through Environment Canada's website at www.ec.gc.ca/toxics.

The USEPA RED document [*Polyhedral Inclusion Bodies of Gypsy Moth (Lymantria Dispar) and Douglas Fir Tussock Moth (Orgyia Pseudotsugata) Nuclear Polyhedrosis Viruses*] is available on the Office of Pesticide Programs' website at www.epa.gov/pesticides/reregistration under Chemical Status.

Appendix I Products containing PIBs of OpNPVs registered in Canada as of 31 December 2003

Reg. no.	Trade name	Registrant	% TGAI	Guarantee*	Class
20290	TM Biocontrol-1	Corporation CCIP	3.5	70 million AU/g	Technical
19293	TM Biocontrol-1	Corporation CCIP	3.5	70 million AU/g	Restricted
17786	Virtuss	Corporation CCIP	2.5	10^{10} PIBs/g	Restricted

* Definition: 1 AU (activity unit) is defined as 92.178 polyhedral inclusion bodies (PIBs)

Appendix II Canadian and American uses

	Canada		United States
Product	TM Biocontrol-1	Virtuss	TM Biocontrol-1
Class	Restricted		
Pest	Douglas fir tussock moth	Douglas fir tussock moth	Douglas fir tussock moth
Crop/use site	Forest/woodlands Right-of-ways Tree nurseries Seed orchards Treed areas of less than ½ ha where high-valued or ornamental trees may be attacked		Forest trees (Douglas fir, true fir, willow, cedar)
Maximum rate*	2.681×10^9 AU/ha	2.5×10^{11} PIBs/ha (~2.7×10^9 AU/ha)	2.298×10^9 AU/ha
Timing of application	1st and 2nd instar stage when larvae have migrated from the egg masses and are actively feeding on the current year's foliage.		Spring foliar
Application method/equipment	Aerial application: boom and nozzle or rotary atomizers on fixed wing aircraft or helicopters; droplet diameter of 100–250 µm Ground application: hydraulic sprayers	Aerial application: boom and nozzle or Micronair spinning nozzles on fixed wing aircraft or Beecomist spinning nozzles with drilled sleeves on helicopters; droplet diameter of 100–250 µm Ground application: hydraulic sprayers	
Re-entry period	Not required		
Protective equipment	Mask/respirator	Mask/respirator	Long-sleeved shirt, long pants, socks, shoes, protective gloves, goggles/face shield
Restrictions	Do not allow spray mixture to stand in the tank for more than 12 hours.	Do not spray into lakes, streams or ponds. Spray mixture must be discarded if not used within 12 hours of mixing.	Keep out of lakes, streams and ponds, avoid spraying sites such as residential areas, schools, playgrounds, or similar sites where people or pets may be present.

* Definition: 1 AU is defined as 92.178 PIBs