

Environmental Appeal Board

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APPEAL NOS. 2004-PES-002(a), 2004-PES-004(a), 2004-PES-005(a)

In the matter of an appeal under section 15 of the *Pesticide Control Act*, R.S.B.C. 1996, c. 360.

BETWEEN:	Ecological Health Alliance Gordon Watson Nonna Weaver		APPELLANTS
AND:	Deputy Administrator, Pesticide Control Act		RESPONDENT
AND:	Ministry of Forests		THIRD PARTY
BEFORE:	A Panel of the Environmental A Alan Andison, Chair	ppeal Board	
DATE:	Conducted by way of written submissions, concluding on April 7, 2004		
APPEARING:	For the Appellant: Ecological Health Alliance Gordon Watson Nonna Weaver For the Respondent: For the Third Party:	Katy Young Gordon Watson Nonna Weaver Aaron Miller Leah Greathead, Co Diane Roberts, Cou Elizabeth Rowbotha	ounsel nsel im, Counsel

APPEALS

These appeals were filed against Pesticide Use Permit No. 402-646-2004 (the "Permit"), issued on February 12, 2004 by Jeff G. Fournier, Deputy Administrator, Pesticide Control Act, Ministry of Water, Land and Air Protection ("WLAP"). The Permit was issued to the British Columbia Ministry of Forests ("MOF"). The Permit authorizes the use of Foray 48B, with the active ingredient *Bacillus thuringiensis Berliner ssp Kurstaki* ("Btk"), in a spray program designed to eradicate localized populations of the North American gypsy moth (*Lymantria dispar (L)*) in Saanich and Delta, British Columbia.

The Environmental Appeal Board has the authority to hear these appeals under section 11 of the *Environment Management Act* and section 15 of the *Pesticide Control Act* (the "*Act*"). The Board's authority under section 15(7) of the *Act* is as follows:

On an appeal, the appeal board may:

- (a) send the matter back to the person who made the decision being appealed, with directions,
- (b) confirm, reverse or vary the decision being appealed, or
- (c) make any decision that the person whose decision is appealed could have made, and that the board considers appropriate in the circumstances.

The Appellants seek an order canceling the Permit. Alternatively, the Ecological Health Alliance ("EHA") requests an order varying the Permit so that it does not allow aerial pesticide or other pesticide applications on people and their homes.

BACKGROUND

The gypsy moth is native to Europe and North Africa. The gypsy moth was introduced to North America through ships and goods arriving from Europe that carried adult moths and egg masses. The descendants of those European ancestors are referred to as the North American gypsy moth, and have become established in Ontario, Quebec and the northeastern United States. The North American gypsy moth has been introduced to British Columbia through larvae and egg masses on cars and goods arriving from areas where the moth is established. There are no known permanent gypsy moth populations in British Columbia.

Gypsy moth larvae feed on the leaves of over 300 plant species, including fruitbearing trees, oak, dogwood, and alder. The larvae prefer deciduous trees, but may also feed on some coniferous trees. MOF provided evidence to the Panel that, if the gypsy moth became established in British Columbia, potential negative effects include the defoliation of trees and other plants, and possible restrictions placed on the import of British Columbia products, such as lumber and nursery products, by trade partners inside and outside of Canada.

In British Columbia, gypsy moth management is directed by the Gypsy Moth Committee of the B.C. Plant Protection Advisory Committee. The Gypsy Moth Committee includes representatives from WLAP, MOF, the Ministry of Agriculture, Food and Fisheries, the Canadian Food Inspection Agency, and the Canadian Forestry Service. The management strategy is to eradicate local populations and prevent widespread gypsy moth colonization of British Columbia.

The eradication strategy depends on a monitoring system to detect new moth introductions, and includes surveys for egg masses and larvae, as well as pheromone traps to catch adult male moths. A significant number of moths and the detection of viable egg masses indicate a breeding population of gypsy moths. The results of the summer 2003 trapping program in the Lower Mainland and Vancouver Island revealed breeding populations of gypsy moths in North Delta and Saanich. Data submitted by MOF shows that, in 2003, a total of 43 male gypsy moths and 15 viable egg masses were found in North Delta, and 33 male moths and 2 viable egg masses were found in the Gordon Head area of Saanich near Mount Douglas Park. There were also a number of sites where one to four male moths were detected.

At a meeting held on October 22, 2003, the Gypsy Moth Committee recommended that aerial spraying of Foray 48B be conducted three times, at a rate of 50 British

Imperial Units per hectare, which is equivalent to 4 Litres per hectare, in North Delta and Gordon Head, to eradicate those gypsy moth populations. The Gypsy Moth Committee reached that conclusion based on the 2003 survey results, noting that mass trapping previously conducted in North Delta had not been successful in preventing the establishment of a breeding population. The Gypsy Moth Committee also recommended mass trapping for several other areas where more than a single moth was detected but there was no evidence of a breeding population.

In Canada, pesticides such as Foray 48B are registered under the federal *Pest Control Products Act*, which is administered by the Pesticide Management Regulatory Agency, Health Canada. In 1990, Foray 48B was registered for use in Canada by Novo Nordisk. It is now registered and distributed by Valent BioSciences Corporation. The active ingredient in Foray 48B, Btk, is a bacterium that produces a crystalline toxin in the alkaline digestive tracts of lepidopterous larvae¹. When the formulation is sprayed on vegetation favoured by the gypsy moth larvae as food, Btk bacteria are ingested and kill the caterpillars. The other ingredients in Foray 48B, which are generally referred to as "inerts", are trade secrets belonging to the manufacturer and have not been disclosed to the general public, the parties to this appeal, local health authorities, or this Panel.

Foray 48B was in the process of registration renewal when the Permit was issued. The Permit includes a condition that MOF must confirm with the Deputy Administrator that the renewed product is still appropriate for the conditions and intended use set out in the Permit. On March 30, 2004, the Pesticide Management Regulatory Agency approved the renewal of the registration of Foray 48B under Pest Control Product No. 24977. The registration renewal certificate is valid until December 31, 2004. Foray 48B is approved for aerial use in forests, woodlands, and residential areas.

On December 1, 2003, MOF applied to WLAP for a permit to aerially spray Foray 48B over a 23 hectare area in North Delta and a 570 hectare area in Gordon Head, as recommended by the Gypsy Moth Committee.

The Deputy Administrator subsequently referred MOF's application to the Regional Pesticide Review Committee for comment. The agencies that are represented on that Committee include some, but not all, of the same agencies represented on the Gypsy Moth Committee. Four members of the Regional Pesticide Review Committee provided written feedback on MOF's application. Their feedback is discussed later in this decision.

On February 12, 2004, the Deputy Administrator issued the Permit. The Permit authorizes a maximum of three aerial and/or ground-based applications of Foray 48B between April 15, 2004 and June 20, 2004, on "public lands or other lands referred to in section 10(2) of the *Pesticide Control Act Regulation*" within the boundaries of the target zones in North Delta and Gordon Head. Maps attached to the Permit indicate that the target zone in North Delta is a rectangular area roughly bounded by 116th and 118th Streets to the west and east, and 86A and 87th Avenues

¹ *Lepidoptera* are a large order of insects comprised of butterflies, moths and skippers that as adults have four broad wings and that as larvae are caterpillars.

to the north and south, while the target zone in Gordon Head focuses on Mount Douglas Park and some residential areas to the south and west of that park.

The conditions of the Permit stipulate that pesticide spraying is to be carried out at a maximum distribution rate of 4 litres per hectare, and that treatments are to take place during daylight hours, with completion by 7:30 a.m. The Permit also specifies that no treatments may take place when wind speeds are greater than 8 km/hour, and pesticide application equipment and droplet size "shall be selected to minimize drift while still achieving the primary treatment objective of Gypsy Moth eradication."

The Permit alone cannot authorize spraying of Foray 48B in the entire proposed spray zone. As noted above, the Permit only applies to public lands and certain private lands described in section 10(2) of the *Pesticide Control Act Regulation*, B.C. Reg. 319/97 (the *"Regulation"*). Section 10(2)(c) of the *Regulation* describes those private lands as follows:

10 (2) (c) ... private land that is used for forestry, transportation or public utility purposes or otherwise for the commercial transmission of electricity, natural gas, oil or water to or for the public or a corporation.

Thus, the Deputy Administrator does not have authority under the *Act* to issue a permit to spray private lands of residences in the proposed spray zone.

To authorize the use of Foray 48B on private lands not covered by section 10(2) of the *Regulation*, the Lieutenant Governor in Council approved and ordered Order In Council 277 on March 25, 2004, thereby making the *North American Gypsy Moth Eradication (North Delta and Mount Douglas) Regulation* (the "*Gypsy Moth Eradication Regulation*"). The *Gypsy Moth Eradication Regulation* is made under the authority of section 8 of the *Plant Protection Act*, R.S.B.C. 1996, c. 365.

On March 8, 2004, the EHA filed an appeal of the Permit.

On March 15, 2004, Gordon Wilson and Nonna Weaver filed separate appeals of the Permit.

All of the Appellants appeal the Permit on the ground that the use of Foray 48B, as authorized under the Permit, will cause unreasonable adverse effects on humans and the environment. Ms. Weaver and Mr. Wilson also appeal on the grounds that the intended objective of the pesticide use is not to control the gypsy moth, but rather, to test equipment and materials for use in germ warfare.

The Deputy Administrator takes no position on the appeals.

MOF requests that the Board confirm the decision to issue the Permit, and dismiss the appeals.

ISSUES

The basic issue to be decided is whether the proposed aerial spray application of Foray 48B, as authorized by the Permit, will cause an "unreasonable adverse effect." The Panel will analyze this question in two sub-issues:

- 1. Whether aerial spraying Foray 48B, as authorized by the Permit, will cause an adverse effect on human health or the environment.
- 2. If so, whether the adverse effect(s) will be unreasonable.

RELEVANT LEGISLATION

Pesticide use permits are issued pursuant to section 6(3) of the *Pesticide Control Act*, as amended, which reads as follows:

- **6** (3) The administrator
 - (a) may issue a permit or approve a pest management plan if satisfied that
 - (i) the applicant meets the prescribed requirements, and
 - (ii) the pesticide application authorized by the permit or plan *will not cause an unreasonable adverse effect*, and
 - (b) may include requirements, restrictions and conditions as terms of the permit or pest management plan.

[emphasis added]

Section 1 of the *Act* defines "adverse effect" as an effect that results in damage to humans or to the environment. Section 12(2)(a) states that the administrator "has the powers necessary" to "determine in a particular instance what constitutes an unreasonable adverse effect".

The Board summarized the relevant legislation and case law in *Maureen Fitzmaurice et al. v. Deputy Administrator, Pesticide Control Act* (Appeal No. 00-PES-001 to 014), [2000] B.C.E.A. No. 22 (Q.L.), as follows:

[A]t the federal level, the *Pest Control Products Act*, R.S.C. 1985, P.-9 requires a pesticide to be registered before that pesticide can be sold or imported into Canada. It also provides that the pesticide must be used in accordance with its label. The onus is on the applicant to submit all relevant studies to the federal government to show that its product does not cause an "unacceptable risk of harm to public health, plants, animals and the environment" (*Pest Control Products Regulations*, section 18(d)(ii)), before a decision is made to register a pesticide.

The British Columbia Court of Appeal has ruled that the Environmental Appeal Board can consider a registered pesticide to be generally safe when used in accordance with the label (*Canadian Earthcare Society* v. *Environmental Appeal Board* (1988), 3 C.E.L.R. (N.S.) 55). However, it is also clear that the fact that a pesticide is federally registered does not mean that it can never cause an unreasonable adverse effect.

Justice Legg, in *Islands Protection Society* v. *British Columbia Environmental Appeal Board* (1988), 3 C.E.L.R. (N.S.) 185 (B.C.S.C.) found that, in making its decision, the Board should engage in a twostep process to determine whether a pesticide application would cause an unreasonable adverse effect. The first stage is to inquire whether there is any adverse effect at all. The second stage is if the Board decides that an adverse effect existed, then the Board has to undertake a risk-benefit analysis to ascertain whether that adverse effect is reasonable.

The Court of Appeal decision in *Canadian Earthcare Society* supported Justice Lander's finding, in the court below, that:

Should the Board find an adverse effect (i.e. some risk) it must weigh that adverse effect against the intended benefit. Only by making a comparison of risk and benefit can the Board determine if the anticipated risk is reasonable or unreasonable. Evidence of silvicultural practices will be relevant to measure the extent of the anticipated benefit. Evidence of alternative methods will also be relevant to the issue of reasonableness. If the same benefits could be achieved by an alternative risk free method then surely the use of the risk method would be considered unreasonable.

In *Weir v. Environmental Appeal Board et al.* 2003 BCSC 1441, the British Columbia Supreme Court confirmed that the Board may consider evidence of the general toxicity of a pesticide, despite the fact that a pesticide has been federally registered, in determining whether a pesticide use will have an adverse effect.

Thus, for the Appellants to be successful, they must show that the use of Foray 48B in the spray areas, in accordance with the conditions in the Permit, will cause an unreasonable adverse effect on human health or the environment. Evidence of alternative gypsy moth control methods is relevant to the issue of reasonableness.

DISCUSSION AND ANALYSIS

1. Whether aerial spraying Foray 48B, as authorized by the Permit, will cause an adverse effect on human health or the environment.

The Appellants submit that the use of Foray 48B under the Permit will be harmful to humans and the environment. The Appellants maintain that aerial spraying of Foray 48B presents a particular risk of harm to pregnant women, the unborn, children, the elderly, asthmatics, people with allergies and chemical sensitivities, and those with weakened immune systems. The Appellants submit that the areas to be sprayed contain thousands of homes, as well as schools, playgrounds, and residential care facilities. The Appellants argue that there have not been adequate studies of the health effects of Btk, and that the pesticide may be contaminated with harmful bacteria or viruses as a result of the method by which Btk is commercially produced.

In support of those submissions, the Appellants provided written statements by themselves or people they know, expressing their opposition to the aerial spraying and describing existing medical conditions that may be aggravated by the proposed spraying. Some written statements also described negative health effects that people suffered during or shortly after previous gypsy moth spray programs, and

that they attribute to the Btk spray. Many of the written statements were from persons residing in or near the areas to be sprayed.

The Appellants also provided letters from two doctors concerning potential health effects from the spraying. Specifically, in a letter dated March 16, 2004, Dr. James E. Tucker, M.D., expresses concern about the potential effects of the spraying on a patient residing in the Mount Douglas area of Saanich. In his opinion, the aerial spraying will be "of dire consequences to her health as she is suffering from chronic environmental sensitivity disorder and is virtually incarcerated in her home." In addition, in a letter dated March 29, 1994, Dr. James G. Houston, M.D., discusses a patient who was exposed to gypsy moth spraying in Vancouver in 1992. Dr. Houston advises that the patient, who was 7 years old when the letter was written, developed serious asthma symptoms shortly after being exposed to the spraying.

The Appellants also provided numerous reports and journal articles challenging the safety of Btk for humans and the environment. The Appellants maintain that those reports and journals support the conclusion that Foray 48B should not be sprayed due to its adverse effects on humans, animals, and insects, the presence of unknown ingredients in Foray 48B, and the lack of long-term health studies.

Additionally, Mr. Watson and Ms. Weaver submit that the permitted spray program is a guise for the testing of germ warfare technology. However, they provided no evidence in support of that assertion.

Finally, Mr. Watson argues that, by allowing the use of Foray 48B, the federal government puts unborn persons at risk of death or deformity contrary to the *Canadian Bill of Rights* and the *Canadian Charter of Rights and Freedoms*. However, Mr. Watson did not cite judicial decisions or provide legal arguments to support his assertions concerning the alleged breach of rights.

The Deputy Administrator took no position on the appeals, but provided the Panel with copies of various documents including the pesticide label, the Pesticide Review Committee's comments concerning MOF's permit application, and the WLAP Technical Report on MOF's permit application.

Comments from the Pesticide Review Committee regarding the permit application were as follows. The Fraser Health Authority recommended that the public be provided with a contact name and telephone number for inquiries or concerns about the spraying, and that "measures be taken to limit direct exposure to the public. (i.e. Time of spraying, Weather conditions)." A representative of the Ministry of Agriculture, Food and Fisheries stated that the areas proposed for treatment are "the minimum required for the program to achieve its goal of eradication of the gypsy moth populations in these areas," and that the Ministry supports the spray program "because of the serious potential impact an established gypsy moth population could have on the export of plants from British Columbia." Environment Canada advised that the spray program should observe Environment Canada's "Standard Conditions Relating to Pesticide Use Permits and Pest Management Plans in British Columbia - February 2004," which exempt Foray 48B from the standard requirements for buffer zones and pesticide free zones around water bodies. A submission by the Vancouver Island Health Authority stated that it had no comment on the proposed pesticide use, but it requested information as to the number of

residents within one kilometer of the spray areas, in order to plan health surveillance activities.

With regard to potential impacts associated with the proposed use of Foray 48B, the Technical Report states that:

No solid scientific information has been put forward that would challenge the long-term safety of this product as verified in the registration process under the *Pesticide Control Product Act* (Canada)...

Regarding short-term effects, anecdotal evidence indicates there may be an increased health risk in persons with asthma and compromised immune systems, however, the Capital Health Region released the results of its human health surveillance study relating to the 1999 spray program. The study reconfirmed the findings of similar scientific studies (U.S., Auckland N.Z., Vancouver, B.C.) and concluded that spraying with the Foray 48B formulation of Btk "causes no general health risk to the population, nor to vulnerable groups within it, such as in children with asthma."

The human health surveys conducted by the Simon Fraser Health Unit in 2000 also did not find any direct human health issues associated with the spray of the Burnaby Lake area. However, it is recognized that some persons may have increased stress levels associated with the fact that they may be exposed to a pesticide product against their will...

Local populations of certain non-target *Lepidoptera* species may be significantly impacted by the spray applications. Information gathered by the B.C. Conservation Data Center indicates that there are no known or expected populations of rare or endangered *Lepidoptera* in or adjacent to the spray area...

Impacts of indigenous *Lepidoptera* are expected to be short term and fully reversible...

The Technical Report concludes that "there is no indication that the proposed pesticide will cause an unreasonable adverse effect on human health or the environment."

MOF submits that the use of Foray 48B in accordance with the Permit will cause no adverse effect to human health, and will have minimal effect on the environment. MOF submits that Btk occurs naturally in the soils of British Columbia, is pathogenic only to moth and butterfly larvae, is non-pathogenic to humans, and is generally safe for the environment except for moths and butterflies. MOF submits that Btk has been used extensively since it was introduced to the market in 1961, and numerous studies have consistently demonstrated that the use of Foray 48B is non-toxic to humans and other non-target species.

MOF notes that several studies have been conducted to determine the effects of previous Foray 48B spray programs on Vancouver Island. MOF argues that all of those studies demonstrate that Foray 48B caused no negative consequence to human health or the environment. In particular, MOF refers to a report titled *Health Symptoms Reported During Btk Spraying, Spring 1994, in the Capital*

Regional District, by the BC Centre for Disease Control, which describes the results of a self-reporting survey of health symptoms that survey respondents ascribed to Btk. Information leaflets were delivered to an estimated 5,250 residents within a 116-hectare spray zone in Victoria, and sixteen completed health questionnaires were received. No persons living within the spray zone reported health complaints associated with the spray program. Five people living within 1 kilometre of the spray zone, and eleven people living more than 1 kilometre from the spray zone, reported health symptoms that they attributed to the spraying. The study notes verification of exposure to the spraying could not be obtained in an objective manner.

MOF also refers to a report titled *The Effects of Aerial Spraying with* Bacillus thuringiensis Kurstaki *on Children with Asthma*, published in the Canadian Journal of Public Health in 2002, which describes the results of a study that assessed the effects of aerial spraying with Foray 48B on children with asthma, during and after the 1999 spray program on Vancouver Island. That report concludes that:

... there was no evidence of adverse effects on a group of children with asthma from the use of Foray 48B by aerial spraying, at least under the conditions existing at the time of the spraying. The population was advised to stay indoors with windows and doors closed during the spraying. It is possible that if this had not been done, adverse effects may have been seen. However, even in those in whom Btk was isolated from their nose within 2 hours of the spraying, no adverse effects could be demonstrated.

MOF notes that the study on asthmatic children was part of a larger health surveillance project coordinated by the Capital Health Region Office of the Medical Health Officer. The seven-part study included a survey of the general health of the population, monitoring and analysis of visits to doctors' offices and hospital emergency departments, laboratory surveillance of clinical samples that contained Btk, and a review of self-reported complaints of health symptoms made to telephone information and support hotlines. MOF submits that the surveillance study found no relationship between aerial spraying of Foray 48B and short-term human health effects. Many of the health complaints reported during the spray were as commonly reported before the spray as they were shortly after.

With regard to effects on the environment, MOF refers to a study titled, *Responses of songbirds to aerial spraying of the microbial insecticide* Bacillus thuringiensis *var.* kurstaki (Foray 48B) *in Garry Oak habitat on Vancouver Island, 1999-2000*, prepared by Biolinx Environmental Research Ltd. as part of the monitoring program for the 1999 spray in Victoria. That study concluded as follows:

The results of this and previous studies indicate that the use of Btk to control Gypsy Moth populations has few, if any, effects on songbird abundance. Btk-spray is much preferable to broad-spectrum insecticides because arthropod-prey other than caterpillars remain available for birds. Possible impacts on songbirds, especially rarer species, can be minimized by focusing Btk applications to areas of high pest concentrations, thus providing songbirds with a mosaic of refuges containing caterpillar prey.

MOF also refers to a study titled, *Non-target Lepidoptera on Southern Vancouver Island: Field assessment four years after the 1999 gypsy moth eradication program, 2003 Final Report.* That study indicates that there may be a reduction in non-target moth and butterfly larvae as a result of the spray, but those insect populations will recover within a few years because the size of the spray area is relatively small and there will be re-population from untreated areas.

In support of its submissions, MOF provided affidavits sworn by Peter Hall, a Provincial Forest Entomologist with MOF, and Dr. Richard Stanwick, M.D., Chief Medical Health Officer for the Vancouver Island Health Authority. Numerous documents, including the reports referred to above by MOF, are attached to those affidavits as exhibits.

Panel's findings

The Panel notes that the Permit only applies to public lands within the target areas, such as schools and parks, and private lands covered by section 10(2) of the *Regulation*, such as private lands used for forestry, transportation or public utility purposes. The Permit does not authorize spraying over other private lands, such as private residences. The *Gypsy Moth Eradication Regulation* authorizes spraying over those private lands, and the Board has no jurisdiction to consider the merits of that regulation. Accordingly, in this case, the Panel is limited to considering the potential for unreasonable adverse effects on human health and the environment arising from the spraying over those lands covered by the Permit.

The Panel notes that the label for Foray 48B states that it is a water-based formulation, and contact with skin, eyes and clothing should be avoided. Although the Permit contains conditions designed to minimize direct human exposure to the spraying, there remains a risk of direct exposure because there is no way to prevent people from being outdoors during the spraying. For example, newspaper carriers, joggers, and people walking their dogs may be outdoors before the spraying must cease at 7:30 a.m. In addition, the WLAP Technical Report indicates that some persons may suffer increased stress as a result of the spraying being conducted against their will.

The Panel also notes that at least some of the Appellants and/or members of the EHA live or work in the treatment area in Gordon Head. Letters submitted by members of the EHA indicate that at least some of them have home or work addresses within the Gordon Head treatment area. There is also a letter from one doctor indicating that a member of the EHA who resides in or near the spray zone and has environmental sensitivities may suffer adverse health effects if exposed to the pesticide.

Thus, while there is no evidence that the spraying will cause long-term adverse health effects, the evidence establishes that there is some risk that persons who are directly exposed to the pesticide, or who reside in the spray areas and have pre-existing environmental sensitivities, may experience adverse health effects. Thus, the Panel finds that there may be some risk of site-specific adverse health effects if spraying is conducted in accordance with the Permit.

Further, the evidence indicates that there will be a short-term adverse environmental effect as a result of the proposed spraying. Specifically, the Technical Report and MOF's submissions acknowledge that Btk will kill non-target *Lepidoptera* that are in similar life stages as the gypsy moth at the time of spraying. Local populations of non-target *Lepidoptera* are likely to be significantly impacted and suffer reduced populations or even extirpation in the spray area for a period of time, perhaps a few years. The evidence indicates that it is unlikely that there are any rare or endangered *Lepidoptera* in the spray area, and local populations of non-target *Lepidoptera* will repopulate the area over time. However, it is clear that the spraying will cause a temporary adverse effect on local populations of non-target *Lepidoptera* located within the areas to be sprayed.

In summary, the Panel finds that there is evidence that the use of Foray 48B, as authorized by the Permit, will have an adverse effect on the environment, i.e. nontarget moths and butterflies in the spray zone, and may pose a risk of an adverse effect on the health of some people residing within the spray zones.

As stated in *Earthcare*, if the Panel finds an adverse effect, i.e. "some risk", it must then enter into a comparison of the risks and benefits, weighing the adverse effect against the intended benefit of the pesticide application and considering alternative pest control methods, to determine whether the adverse effects are unreasonable.

2. Whether the adverse effect(s) will be unreasonable.

The Appellants submit that gypsy moths have never caused severe damage to vegetation in British Columbia, and exports of logs, Christmas trees, and nursery products from British Columbia are already subject to inspections and pesticide treatments. The Appellants argue that it would be no additional hardship to inspect those goods for gypsy moths. The Appellants submit that money diverted from aerial pesticide spraying could be used to ensure that export goods are free of gypsy moths.

In addition, the Appellants submit that aerial spraying is both an extreme and unnecessary measure, and non-chemical pest control methods, such as mass trapping, can be effective in eradicating gypsy moth populations. They note that mass trapping was used in the target areas in 2003, and they submit that mass trapping should be conducted again this year. The Appellants maintain that mass trapping does not have the negative impacts associated with urban aerial pesticide spraying, and may provide seasonal employment for local residents.

The Deputy Administrator took no position on this issue. However, the WLAP Technical Report states as follows regarding alternative control methods and the risks/benefits of aerial spraying:

Non-chemical Controls

Additional pertinent information from the 2000 gypsy moth eradication permit was also used to evaluate the currently proposed pesticide use. Concerned citizen Jean Wallace had provided the following technical arguments that were reviewed in detail. Key aspects of her arguments and their merits are evaluated as follows:

<u>Mass trapping</u> - She indicated over the phone and via written submission that mass trapping was being used in the U.S. for

gypsy moth eradication. A review of the control activities in the U.S. and E-mails from John Anhold in Utah confirm that mass trapping is not an eradication technique rather a monitoring tool used with chemical control regimes. Since the 2000 permit, this type of control failed to be effective in 2003 to control the population in North Delta.

<u>Pheromone disruption</u> - This was discussed as a control option but [WLAP] correspondence with Phillip Marshal (Indiana), Kevin Thorpe (Maryland) and reviews of practices in the US confirmed that this tool is only used effectively with the "slow-the-spread" program and not in eradication efforts.

Egg mass searches and larval trapping - This was mentioned as an alternate to pesticide treatment. Technically, this is feasible as part of a control program but not effective for eradication efforts.

<u>Volunteer work</u> - This was discussed primarily in the context of mass trapping but other volunteer work was also suggested. The applicant has in the past worked with groups wishing to assist in control measures but with the proposed 2004 pesticide use, no volunteer groups have come forward.

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The issue of aerial vs. ground-based pesticide applications was considered. Aerial applications have proven to be far more effective in achieving the gypsy moth eradication objectives than ground sprays. Aerial spray applications are able to achieve a more consistent spray coverage with lower volumes of sprays and do so during substantially shorter treatment times. Aerial spray appear [sic] to be prone to longer distance drift of spray than ground-based treatments but, with lower volumes of actual spray mixture used, where as ground-based applications will have greater volume of localized drift. Additionally, drift associated with ground-based sprays will be over a prolonged time period relative to that associated with aerial sprays.

MOF argues that the potential for a gypsy moth infestation poses a threat to the environment and to human health. It maintains that an established gypsy moth infestation threatens environmental degradation by defoliation of trees, and may have a negative threat to human health by demonstrated allergic reactions to the gypsy moth larvae. MOF also maintains that an established gypsy moth population may have a negative economic impact on the province. Thus, MOF submits that an established gypsy population poses a more significant threat than the aerial spraying of Foray 48B.

Furthermore, MOF submits that the Gypsy Moth Committee considered various alternative pest control methods before it concluded that aerial spraying of Foray 48B was the most appropriate method to carry out successful eradication of the gypsy moth breeding populations in North Delta and Saanich. MOF notes that the Committee concluded that other methods such as mass trapping and ground-based spraying were ineffective when used in the past in North Delta, and would be

ineffective in this case. In addition, aerial treatment was considered appropriate due to factors such as the distribution of moths found in traps, the size of the areas requiring treatment, and the steep, wooded terrain in the Mount Douglas area of the Gordon Head target zone.

In support of those submissions, MOF referred to the affidavits of Mr. Hall and Dr. Stanwick. Mr. Hall states that aerial spraying is generally more effective at eradicating gypsy moths than ground-based spraying, especially when large areas have to be treated in a short time frame. He states that it is very difficult to get ground-based sprays into the upper parts of tree canopies, and ground-based spraying is usually only useful as an eradication method for small, isolated moth populations. For the Mount Douglas area in Saanich, ground spraying would be difficult to carry out while the moths are in larval stage due to the terrain and size of the target area. Mr. Hall also states that ground-based spraying increases pesticide exposure for both residents and pesticide applicators.

With regard to the North Delta target area, Mr. Hall attests that ground spraying was carried out in 2001, but there were difficulties with ensuring uniform pesticide dosage and coverage, and some homeowners refused permission to spray on their properties. Subsequent trapping programs showed an increasing gypsy moth population, and the ground spray program was deemed ineffective. MOF also implemented mass trappings in 1999 and 2000 to eradicate the gypsy moth, without success in eradicating the moth.

Mr. Hall also states that ground-based spraying was conducted on southern Vancouver Island in Spring 1998, in conjunction with mass trapping and manual picking of egg masses and larvae, but 500 male moths were subsequently captured that year, which was more than double the number of moths captured in that area in 1997. Mr. Hall states that mass trapping would not be effective for the size and nature of the infestations found in Saanich and North Delta.

Moreover, Mr. Hall states that the impact on trade resulting from an established gypsy moth population in British Columbia would be substantially greater than the impact in eastern Canada, because many of the trade partners of eastern provinces already have established gypsy moth populations, whereas British Columbia's major trading partners are currently free of the gypsy moth and wish to maintain that status.

Panel's Findings

The Panel notes that the purpose of the 2004 spray program is to eradicate the gypsy moth in the target areas, primarily because of the potential impact of an established gypsy moth population on the exports of some forest products and nursery products from British Columbia. Eradication programs allow British Columbia to maintain its non-infested status, and thereby avoid trade restrictions placed by non-infested trading partners, such as the western United States. There are other potential impacts on the environment, due to defoliation, and human health, as some people are allergic to gypsy moth hairs.

Based on the Technical Report and the evidence of MOF, the Panel concludes that, in this case, aerial spraying of Foray 48B is the most appropriate and effective method for eradicating local breeding populations of gypsy moths in the target areas. The Technical Report states that alternatives to aerial spraying of Foray 48B

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are not effective for eradication programs where a significant moth population is detected and the treatment area is relatively large, as is the case with the target areas in North Delta and Saanich. Some of the alternative methods are useful for monitoring and detection, and are used sometimes for control where the moth population is small and isolated or the goal is not eradication but merely to control or slow the spread of established populations.

Next, the risk of a temporary but significant decrease in non-target *Lepidoptera* and the risks to human health (namely, the risk that some people may suffer skin or eye irritation if directly exposed to the spray, and people with existing environmental sensitivities may suffer adverse health effects if exposed to the spray) must be weighed against the threat of trade restrictions on some forest products and nursery stock, and subsequent economic harm, as well as potential impacts from defoliation and for persons who are allergic to gypsy moth hairs.

The Panel finds that the adverse effects of the proposed spray program are not unreasonable in the circumstances of this Permit. The Panel is satisfied, based on the Technical Report and the evidence of MOF, that the harm to the environment will be limited to non-target *Lepidoptera* and will be temporary, and the risks to human health, should any persons be directly exposed to the pesticide, will be temporary and relatively minor. The Panel finds that those adverse effects do not outweigh the potential economic harm to the provincial economy if a gypsy moth population became established and trade sanctions were imposed on certain forestry and nursery products exported from British Columbia.

In addition, the Panel finds that MOF's evidence establishes that the potential negative impacts on the sensitive Garry Oak groves of southern Vancouver Island could be harmful if the gypsy moth is not eradicated.

In summary, after taking into consideration alternatives to aerial spraying of Foray 48B, the Panel finds that the benefits of eradicating the gypsy moth through aerial spraying in accordance with the Permit outweigh the potential adverse effects to the environment and human health associated with the spraying. Accordingly, the Panel finds that the adverse effects of the spray program are not unreasonable.

DECISION

In making this decision, the Panel has considered all the relevant documents, evidence and submissions made at the hearing, whether or not they have been specifically reiterated here.

For the reasons provided above, the Permit is confirmed.

Accordingly, the appeals are dismissed.

Alan Andison, Chair Environmental Appeal Board

April 14, 2004