

Environmental Appeal Board

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APPEAL NO. 2001-PES-003(b)

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

BETWEEN:	Josette Wier		APPELLANT
AND:	Deputy Administrator, Pesticide Control Act		RESPONDENT
AND:	Minister of Forests, Morice Forest District		PERMIT HOLDER
BEFORE:	A Panel of the Environmental Appeal Board Alan Andison, Chair		
DATE:	June 17-20, 2002		
PLACE:	Smithers, BC		
APPEARING:	For the Appellant: For the Permit Holder:	Thomas R. Buri, Q.C. Susan Ross, Counsel Elizabeth Rowbotham	n. Counsel

RECONSIDERATION OF APPEAL

On July 23, 2002, the Board issued a decision in this appeal (*Wier v. Deputy Administrator, Pesticide Control Act*, Appeal No. 2001-PES-003(a); [2002] B.C.E.A. No. 43 (Q.L.)). Josette Wier appealed the issuance of pesticide use permit no. 402-582-01/03 (the "Permit"). The Permit was issued by the Deputy Administrator, Pesticide Control Act (the "Deputy Administrator"), to the Minister of Forests, Morice Forest District (the "Permit Holder"), and authorized the application of monosodium methane arsenate ("MSMA") to control spruce bark beetle and mountain pine beetle in the Morice Forest District and Tweedsmuir Provincial Park from May 14, 2001 to October 31, 2003. After hearing all of the evidence, the Board confirmed the issuance of the Permit, with certain amendments.

Ms. Wier applied to the B.C. Supreme Court for a judicial review of the Board's decision. On September 24, 2003, the Court concluded in *Wier v. Environmental Appeal Board et al.*, 2003 B.C.S.C. 1441 (hereinafter *Wier*), that the Board had erred in applying the second part of the legal test used in its decision to determine

whether the permitted pesticide use would cause an "unreasonable adverse effect" under section 6(3)(a)(ii) of the *Pesticide Control Act* (the "*Act*").

The Court directed the Board to reconsider its original decision, and specifically, to "consider the viable alternatives disclosed by the evidence when applying the second step of the legal test used in" its decision.

This decision is the Board's reconsideration of the second step of the legal test, as directed by the Court. This decision is limited to a consideration of the viable alternatives that were disclosed by the evidence that was before the Board when it issued its 2002 decision.

BACKGROUND

Under section 6(3)(a)(ii) of the *Act*, an administrator may issue a pesticide use permit if satisfied that "the pesticide application authorized by the permit or plan will not cause an unreasonable adverse effect." Section 1 of the *Act* defines "adverse effect" as "an effect that results in damage to humans or to the environment."

In deciding appeals of pesticide use permits, the Board applies a two-step test to determine whether the use of pesticides under a permit will cause an "unreasonable adverse effect." That test was developed by the B.C. Court of Appeal in *Canadian Earthcare Society v. Environmental Appeal Board* (1988), 3 C.E.L.R. (N.S.) 55 (hereinafter *Canadian Earthcare*), and was applied by Justice Legg of the B.C. Supreme Court in *Islands Protection Society v. British Columbia Environmental Appeal Board* (1988), 3 C.E.L.R. (N.S.) 185 (hereinafter *Islands Protection*).

The Board recently summarized the two-step test, and the case law from which it is drawn, in *Ecological Health Alliance et al. v. Deputy Administrator, Pesticide Control Act* (Appeal Nos. 2004-PES-002(a), 2004-PES-004(a), and 2004-PES- 005(a)), [2004] B.C.E.A. No. 10 (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* ...).

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.

...

The Court of Appeal decision in *Canadian Earthcare* ... 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. <u>Only by</u> <u>making a comparison of risk and benefit can the Board</u> <u>determine if the anticipated risk is reasonable or unreasonable.</u> <u>Evidence of silvicultural practices will be relevant to measure</u> <u>the extent of the anticipated benefit.</u> Evidence of alternative <u>methods will also be relevant to the issue of reasonableness</u>. 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.

[emphasis added]

In *Islands Protection*, which was issued shortly after the decision in *Canadian Earthcare*, Justice Legg summarized the two-step test from *Canadian Earthcare* as follows:

The first stage was to inquire whether there was any adverse effect at all. If not, that was the end of the necessary inquiry. The second stage was if the Board decided that an adverse effect existed, then the Board had to undertake a risk-benefit analysis to ascertain whether that adverse effect as reasonable or unreasonable.

Thus, the two-step test involves first determining whether the authorized pesticide use will cause an adverse effect, namely, "some risk" of an effect that results in damage to humans or to the environment. If so, then the second step involves a risk-benefit analysis to determine whether the adverse effect is "unreasonable." Evidence of silviculture practices and alternative pest control methods is relevant to the issue of reasonableness.

In its 2002 decision in this appeal, the Board held that, subject to certain amendments to the Permit, the use of MSMA under the Permit would not cause "an unreasonable adverse affect," and that, therefore, it was unnecessary to review the second part of the test. Specifically, the Board concluded as follows:

The Panel has concluded that the volume of MSMA allowed under the Permit should be reduced by 1/3 or the 50,000 trees that has been agreed to by the Permit Holder. In addition, the volume should be reduced by 5%, or an additional 7,500 trees, to account for the trees

that would have been treated in Tweedsmuir Park. Finally, the Panel finds that the reference to the application of MSMA in Tweedsmuir Provincial Park should be deleted from the Permit.

With these amendments, the Panel is satisfied that the application of MSMA under the Permit will not cause an unreasonable adverse affect. Under these circumstances it is unnecessary to review the second part of the test to determine if the same benefits could be achieved through alternate risk free methods. That being the case, it is unnecessary to further consider the very helpful evidence that was given by Dr. Partridge and Dr. Safranyik.

In *Wier*, the Supreme Court concluded that the Board had erred in law by finding that the use of MSMA under the Permit, as amended by the Board, would not cause an "unreasonable adverse effect" without having considered the second step of the *Canadian Earthcare* test. At paragraphs 45 to 50 of *Wier*, the Supreme Court stated as follows:

[45] In the case at bar, the petitioner submits that the Board... found some adverse effect in that, to use the language of Lander J. it found some risk, but concluded that that adverse effect was not unreasonable without considering the evidence of Dr. Partridge and Dr. Safranyik. In so doing it failed to follow the second step of the two-step test articulated in *Earthcare*. That is to say, the Board reached a conclusion with respect to the anticipated risk without a proper consideration of the anticipated benefits including consideration of silviculture practices and alternative methods.

...

[48] In my view, the Board... did find that there was an adverse effect in the sense of the term as used by Lander J. in *Earthcare*, "some risk" (*supra* at para. 15). The Board then took steps to make this risk of adverse effects reasonable through modification of the terms of the Permit. It then reached the ultimate conclusion that with these modifications there is no unreasonable adverse effect. However, the Board in undertaking this analysis did not consider the evidence of Dr. Partridge and Dr. Safranyik.

[49] I agree with the petitioner in so doing the Board fell into the same error as the Board in *Earthcare*. It failed to apply the second step of the two-step test articulated in *Earthcare*. The Board excluded from its consideration evidence relevant to the question of whether the risk it had identified was reasonable or unreasonable.

[50] Accordingly, the matter must be remitted to the Board so that it may approach the question of unreasonable adverse effects taking into consideration viable alternatives disclosed by the evidence.

In October 2003, the Permit Holder appealed the Supreme Court's decision to the B.C. Court of Appeal and Ms. Wier cross-appealed. The Permit Holder and Ms. Wier subsequently abandoned both the appeal and the cross-appeal.

The Permit expired on October 31, 2003. On that day, the Board wrote to the parties and offered to undertake the analysis that was ordered by the Court. The Board also noted that the Permit had expired, and requested that the parties confirm whether they wanted the Board to carry out the analysis, given that the Permit had expired.

By a letter dated April 23, 2004, counsel for Ms. Wier responded to the Board, and asked the Board to proceed with its consideration of the second step of the test as ordered by the Supreme Court, despite the expiry of the Permit.

On May 18, 2004, counsel for the Permit Holder confirmed that the Permit Holder was content for the Board to carry out the second part of the analysis.

ISSUE

Whether the viable alternatives disclosed by the evidence support a finding that the adverse effect of applying MSMA is unreasonable.

RELEVENT LEGISLATION

The following provisions of the *Act* are relevant to this appeal:

- **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.

Powers of administrator

- 12 (2) The administrator has the powers necessary to carry out this Act and the regulations and, without limiting those powers, may do any of the following:
 - (a) determine in a particular instance what constitutes an unreasonable adverse effect;

•••

In addition, section 2(1)(a) of the *Pesticide Control Act Regulation*, B.C. Reg. 319/81 (the "*Regulation*") states that no person shall "use a pesticide in a manner that would cause an unreasonable adverse effect." Section 1 of the *Act* defines "adverse effect" as "an effect that results in damage to humans or the environment."

EVIDENCE AND ARGUMENT

As noted above, the Court has directed the Board to reconsider the evidence of "viable alternatives" that are relevant to the second step of the two-step test. In particular, the Court expressed concern that the Board failed to consider the evidence of Dr. Partridge and Dr. Safranyik when it undertook its analysis of the second step of the test.

In its 2002 decision, the Board summarized the parties' submissions in the appeal, including their evidence regarding alternative methods of beetle control. For convenience, that summary is reproduced below, and the evidence regarding the risks and benefits associated with the different methods of beetle control is underlined for emphasis.

Appellant's Evidence

The Appellant submits that the application of MSMA to control mountain pine and spruce bark beetles will have an unreasonable adverse affect on humans and the environment.

In support of that submission Dr. William R. Cullen, Ph.D. Chemistry and a Professor Emeritus in the Chemistry Department at the University of British Columbia, gave expert evidence about the toxicology of arsenic in general and MSMA in particular. Dr. Cullen explained that arsenic is naturally present in the environment. However, Dr. Cullen explained that recent scientific studies have shown that the arsenic compounds found in MSMA are acutely and chronically toxic. In particular, Dr. Cullen gave evidence that when the arsenic compounds found in MSMA are methylated in humans the results are carcinogenic.

Dr. Cullen referenced studies that reported very high levels of arsenic found in the urine of forestry workers who had applied MSMA during the 1970's in the United States. He further referenced recent studies regarding the effects of arsenic on humans and specifically a study entitled *Recent Advances in Arsenic Carcinogenis* authored by Kirk T. Kitchen in 2001, which he described as an important paper. That paper concludes that when arsenic is methylated in the human body "it is known to cause cancer – skin, lung, urinary bladder, liver and kidney."

Dr. Cullen further explained that arsenic would enter the human body by being ingested or through an open sore. It is not absorbed through the skin. He submitted that with sufficient protective clothing it can be applied safely but that further studies are needed on the impacts of MSMA on workers who work with it.

Dr. Cullen concluded that arsenic is a major problem and is considered the number one toxin of concern in the United States. He stated that, in his opinion, the use of this product poses a risk to human health or the environment.

Ms. Wier, who is a medical doctor by training, also gave evidence in support of her appeal. Much of Ms. Wier's evidence involved her attempts to have the Pesticide Management Regulatory Agency reconsider its decision to register MSMA in Canada. In addition, she described her discussions with provincial government officials respecting the approval of this Permit.

Ms. Wier expressed concern that toxic substances move through the environment once they have been applied. She is concerned that wild animals may be exposed to the arsenic. In particular, she spoke of mountain goats and woodpeckers. However, Ms. Wier had no evidence of site specific concerns arising out of the use of MSMA as authorized under the Permit.

She also submitted that the volumes of MSMA allowed under the Permit are excessive for the areas to be treated. She advised that she had recently flown over the treatment area and could see little evidence of beetle damage.

Finally, Ms. Wier stated her concern about the effects of pesticides, and MSMA in particular, on children should they be exposed to these toxic substances.

Dr. Arthur Partridge also gave expert evidence on behalf of the Appellant. Dr. Partridge holds a Ph.D. in Forestry, specializing in plant pathology and entomology. Dr. Partridge explained that he takes a holistic approach to forestry. He submitted that bark beetles attack trees that are pre-disposed to being invaded. These are trees that are already weakened by such causes as a high water table, fungus, root insects, climate change and rust.

Dr. Partridge stated that, in his opinion, the program for beetle control that is being carried out under the Permit is missing baseline information that should have been determined before the Permit was issued. Specifically, he was concerned that there was insufficient information regarding the condition of the forest before the beetles arrived, a lack of information regarding when the beetles arrived in the area, no information about the pre-disposition of the forest to beetle attack, no information regarding the population of beetle predators in the area, including parasites and woodpeckers.

Dr. Partridge further explained that bark beetle infestations occur in cycles of three to ten years. He expressed concern that there was insufficient information about where in the cycle the current infestation is. This is important because treatment of the beetles after the cycle has peaked will be ineffective because the beetle population will decline on its own. He also noted that up to 40% of trees will survive an attack.

<u>Dr. Partridge acknowledged that MSMA can be part of a beetle control</u> <u>strategy. However, he stated that it should only be used in very</u> <u>localized situations.</u> He also expressed concern that the use of MSMA would affect other predators and parasites of the bark beetle.

Finally, Dr. Partridge recommended that the best way to control bark beetle infestations is through proper management of the forest. This can be accomplished by spacing trees, 18 feet apart for lodge pole pine trees, and keeping the forest floor in a healthy condition.

Permit Holder's evidence

The Permit Holder did not contest the evidence from Dr. Cullen regarding the chemical affects of arsenic.

However, Dr. Laszlo Safranyik gave expert evidence on insect population dynamics, forest entomology and insect management. Dr. Safranyik holds a Ph.D. in Zoology and Forestry, and wrote his Ph.D. dissertation on the sampling of mountain pine beetle populations in lodgepole pine.

Dr. Safranyik explained that spruce beetles and mountain pine beetles are different and must be managed differently. The spruce bark beetle emerges in the spring and the mountain pine beetle emerges in the summer. The similarities between these two types of beetles are that they are injurious to mature forests, they emerge over a short period of time and attack single trees en masse thus preventing the tree from combatting the attack, they attack the largest part of the stem and, under epidemic and endemic situations, they attack the trees that are most able to combat an attack.

Dr. Safranyik stated that for each tree that is attacked and left untreated, three other trees will be attacked when the beetles next emerge. He explained that it is difficult to track where the beetles will attack as they rise above the canopy of the forest and drift with the

wind for many kilometres. When they land they quickly re-colonize a new area of the forest.

Dr. Safranyik agreed with Dr. Partridge that long term management of the forest is the best method of beetle control. However, Dr. Safranyik stated that when landscape level infestations occur, long term management won't work. He was of the opinion that the current infestation was a landscape level infestation. In such circumstances, it is necessary to control the beetle population to save the trees. He compared it to a forest fire situation.

In Dr. Safranyik's opinion, under these circumstances there are three methods of control including logging, MSMA treatment and fall and burn. He stated that MSMA is 90% effective on the trees to which it is applied.

Dr. Safranyik also explained that natural enemies of the bark beetles are ineffective during an epidemic situation. In particular, he noted that woodpeckers are effective predators but, because they are very territorial, they are unable to control the beetles when there is a population explosion. He also noted that woodpeckers feed on the natural enemies of the bark beetles.

Three Ministry of Forests employees also gave evidence on behalf of the Permit Holder: Peter Hall, Provincial Forest Entomologist; Ken White, Prince Rupert Region Regional Forest Entomologist and Dave Nakashoji, Morice Forest District Field Operations Supervisor.

Mr. Hall explained that the Ministry has a province wide strategy to respond to bark beetle infestations. He noted that extensive bark beetle infestations kill timber, impact forest management, result in loss of wood from the AAC (Allowable Annual Cut), impact wildlife corridors, impact forest hydrology and increase fire hazard if the trees are left standing.

Mr. Hall advised that there are 800,000 hectares of beetle infested forest in the province and that the District has the largest outbreak, with patches of varying levels of infestation. <u>He explained that there</u> <u>are generally three zones of infestation which he described as the</u> <u>extreme zone, the sanitation zone and the aggressive management</u> <u>zone. The extreme zone receives no treatment except that the forest</u> <u>is salvaged for as much timber as possible. The sanitation zone is</u> <u>managed through harvesting and some single tree treatment (MSMA</u> <u>treatment and fall and burn). The aggressive zone is managed</u> <u>through all manners of treatment including harvesting, MSMA</u> <u>treatment and fall and burn. He stated that most of the District is</u> <u>covered by the two lower zones.</u> <u>Mr. Hall advised that, of the three means of treatment, harvesting is</u> the preferred method. Single tree treatment represents only a small percentage of the treatment program.

Mr. White gave evidence that the spruce bark beetle is found in the north part of the District and that the mountain pine beetle is found in the south part of the District and in Tweedsmuir Park. According to Mr. White, the District is approximately 1.5 million hectares in size and the bark beetle infestation is on the increase in the District.

He advised that a "Bark Beetle Strategy" was prepared for the District in June 2001 and that the District is broken up into 22 bark beetle management areas. Each of these areas is considered to be in the aggressive management zones. <u>He further noted that Tweedsmuir</u> <u>Park now has heavy infestations of bark beetles and is no longer being</u> <u>considered for single tree treatment, including the use of MSMA.</u>

Mr. White stated that <u>during 2001, 20,000 trees equalling 14,000</u> <u>cubic metres were treated with MSMA under the Permit.</u> <u>During the</u> <u>same period, 2 million cubic metres of infected trees were harvested in</u> <u>the District and 5,000 trees equalling 2,500 cubic metres were treated</u> <u>using the fall and burn method.</u> He further advised that 100% of the harvest allowed in the District during 2001 was directed toward beetle infested trees.

Mr. White explained that treatment with MSMA costs the Ministry \$30.00 per tree, while treatment with the fall and burn method costs the Ministry \$75.00 per tree. Mr. White advised that MSMA treatment must be applied within 3 weeks of a tree being infected. This is generally in August or September for mountain pine beetles as the temperature must be above 18 degrees centigrade before the beetles fly. The MSMA treatment period for spruce bark beetles is between April and June of each year. He advised that the fall and burn method is used during winter so as not to cause a fire hazard. He described the fall and burn method as being more dangerous for workers as they are working on steep slippery slopes in the middle of the winter.

The fall and burn method involves cutting down the infected trees and then burning them to ensure that the beetle larvae are killed.

Mr. Nakashoji gave evidence that independent contractors are hired by the Ministry to carry out the application of MSMA. He explained that these contractors must comply with the safety standards set out on the pesticide label, as well as any safety conditions set out in the contract and in the Permit. He noted that the label is attached to the contract and the contractors are given a copy of the Permit. In addition, the Ministry holds pre-work meetings with the contractors at which time contractors are made aware of the specific requirements set out in the label and other safety requirements of the Ministry. Mr. Nakashoji advised that the pre-work meetings are also a term of the contract.

Mr. Nakashoji advised that he has been a certified pesticide applicator in the past and it is his experience that <u>MSMA is only used in isolated</u> <u>spots such as rocky ridge tops and hills</u>. He stated that he <u>recommends that harvesting be used where possible to control beetle</u> <u>infestations but that some areas are not accessible to harvesting</u>. In <u>those instances single tree treatment is required</u>.

Mr. Nakashoji stated that <u>the Ministry's budget is also a concern when</u> <u>considering which treatment method to use</u>. He advised that, due to his budget for 2002, less trees will receive MSMA treatment this year than those that received treatment in 2001.

Finally, Mr. Nakashoji provided the Panel with <u>copies of notices that</u> <u>are posted when MSMA is used in a particular area</u>. In addition, a <u>notice is posted on each tree that receives MSMA treatment</u>. These <u>notices are printed on water proof paper</u>. Mr. Nakashoji advised that during May of 2002, he saw one posting on a tree that dated back to 1989.

[emphasis added]

DISCUSSION AND ANALYSIS

Whether the viable alternatives disclosed by the evidence support a finding that the adverse effect of applying MSMA is unreasonable.

As indicated in *Canadian Earthcare*, the second step of the test involves a riskbenefit analysis to determine whether any adverse effect of pesticide use is "unreasonable." If there is some risk associated with the use of a pesticide, the Board is to consider whether "the same benefit could be achieved by an alternate risk free method". If the same benefit can be achieved through a risk free method, then the application of pesticides in the circumstances is "unreasonable".

The parties' evidence indicates that the Permit Holder may use several different methods to attempt to control beetle populations in a given area, depending on the level of beetle infestation in the area. Those methods were described by Dr. Safranyik, as follows:

- long-term forest management strategies;
- logging infested areas;
- falling and burning individual infested trees; and
- treating individual infested trees with MSMA.

The first option is considered an indirect method of beetle control, in that long-term forest management strategies are not intended to kill beetles directly. The latter three methods are considered to be direct control methods, because they directly target beetles.

Risks and benefits of long-term forest management strategies

Dr. Safranyik and Dr. Partridge agreed that long-term management of the forest is the best method of beetle control. However, Dr. Safranyik stated that when landscape level infestations such as the present one occur, long-term management strategies will not control the rapid spread of the infestation, and it is necessary to use methods that directly target beetles in order to save trees and prevent further spreading of the infestation.

Conversely, Dr. Partridge is of the opinion that the Permit Holder should not be engaged in a large-scale plan using methods that directly target beetles, because the beetles are a natural part of the forest ecosystem, and direct control techniques may not be effective in any event. Dr. Partridge's view is that pesticide use, in particular, is unnecessary at this time, and no long-term benefit will be achieved by it.

The Panel accepts Dr. Safranyik's evidence that the infestation in the Permit area is a "landscape level epidemic," which is similar in magnitude to a forest fire situation. The Panel notes that Dr. Safranyik's credentials and experience in insect population dynamics are, by Dr. Partridge's admission, superior to those of Dr. Partridge. Further, the majority of Dr. Safranyik's professional career has been spent in British Columbia and has focused almost exclusively on bark beetles and pest management. Dr. Partridge's research has focused less on bark beetles and includes only a few projects in British Columbia. The Panel also notes that Dr. Safranyik's evidence that the area is experiencing a "landscape level infestation" was corroborated by other witnesses, including the Permit Holder's staff, who analyzed aerial data from fixed-wing aircraft, and were responsible for commissioning and analyzing both additional aerial surveys by helicopter and onthe-ground inspections of suspected infestation areas.

The Panel further finds that it is appropriate in these circumstances to use methods that directly target beetles. Although long-term forest management strategies may be lower risk in that they do not involve pesticide use, the Panel finds that those strategies would be ineffective for controlling or mitigating the current beetle infestation, which is at unprecedented levels in many of the areas covered by the Permit. Although the Permit Holder did not provide a monetary figure for the economic loss that would result if no direct control methods were used, the Panel accepts that the infestation would spread at an uncontrolled rate over increasingly large areas until a natural event, such as a catastrophic forest fire or a sustained period of cold weather at the correct time in the beetles' life cycle, resulted in a massive reduction in the beetle population. There is no dispute that, uncontrolled, the spread of the infestation will result in thousands more trees becoming hosts to the beetles each year. Those trees will die and will have diminished economic value

and pose an increased fire risk. In these circumstances, the Panel finds that it is appropriate to use direct methods of beetle control.

The evidence indicates that the Permit Holder uses all three of the direct control methods listed above, depending primarily on the level of infestation in a given area. Areas with extreme levels of infestation are logged in order to salvage as much timber as possible. Areas described as "sanitation zone" are managed through harvesting and some single-tree treatment (MSMA treatment and fall and burn). Areas falling in the "aggressive zone" are managed through all manners of treatment including harvesting, MSMA treatment, and fall and burn. The evidence indicates that most of the District is covered by the two lower zones, while Tweedsmuir Park had, at the time when the appeal was heard, heavy infestations and was no longer being considered for single-tree treatments. Other factors that may be considered when deciding between different direct control methods include the area's accessibility, the time of year when treatment occurs, the risks to workers, and the costs of implementation. Those factors are discussed further below.

Risks and benefits of logging infested areas

The Permit Holder uses logging as the primary method of attempting to control the beetle population within the Permit area. Mr. Hall advised that single-tree treatment represents only a small percentage of the treatment program. Similarly, Mr. Nakashoji stated that harvesting should be used where possible to control beetle infestations, but single-tree treatment is required in areas that are not accessible to harvesting.

The Panel finds that harvesting is the preferred method of beetle control and is used exclusively to control the beetle population where possible. However, where trees are located in areas where harvesting is not possible, single-tree treatment is required. Under these circumstances, the failure to use single-tree treatment would allow the beetle population to grow in an unfettered manner and continue to pose an unacceptable risk to the rest of the forest. The risk of leaving the forest unprotected and subject to the serious physical and economic harm that a landscape level epidemic poses far outweighs the benefit of not using single-tree treatment. The result would be similar to allowing a spot fire or lightning-struck tree to burn uncontrolled. This would avoid the risks associated with fire fighting, however, it would put the rest of the forest at risk of total loss.

Given this finding, the remainder of the Panel's inquiry focuses on a comparison of the two methods of single-tree treatments.

Risks and benefits of falling and burning individual infested trees

The "fall and burn" method involves falling, bucking, and burning individual infested trees. The trees are burned to ensure that the beetle larvae in the tree are killed.

While the fall and burn method is as effective as MSMA for killing beetles in individual trees, according to the testimony at the hearing, this method has two main drawbacks:

- the cost ranges from just over two times to five times as much as using MSMA; and
- falling and burning trees is only done in the winter, and winter logging can be unsafe for fallers.

Specifically, the Permit Holder's evidence indicates that treatment with MSMA costs \$30.00 per tree, while the fall and burn method costs \$75.00 per tree. The fall and burn method is used during winter because that is when the risk of forest fires is the lowest. This method is dangerous for fallers because they are working on steep slopes, which are slippery in the winter.

Thus, falling and burning is not a risk-free alternative to MSMA, nor is it more effective than MSMA. Therefore, the Panel has considered the risks and benefits associated with the use of MSMA under the Permit.

Risks and benefits of treating individual infested trees with MSMA

The use of MSMA under the Permit involves injecting the pesticide into trees which are infested with beetles. The trees are not cut down or burned. MSMA must be applied within 3 weeks of a tree being infested, which is generally in August or September for mountain pine beetles, and between April and June for spruce bark beetles.

With regard to the benefits of MSMA, the Panel accepts Dr. Safranyik's evidence that MSMA is 90% effective for killing beetles in trees to which it is applied. In addition, the Panel accepts the Permit Holder's evidence that MSMA costs significantly less to implement than the fall and burn method, and presents a lower risk to workers. Furthermore, trees treated with MSMA remain standing as an important component of the forest ecosystem.

In terms of the risks associated with the use of MSMA under the Permit, the Board stated in its 2002 decision that it posed a risk to human health or the environment, due to the large volume of MSMA approved for treatment during the remaining term of the Permit. The Board found that risk to be unreasonable and, accordingly, amended the Permit to reduce the risk to a reasonable level. Specifically, the Board held as follows:

The Panel finds that the Permit, as drafted, will allow the application of MSMA on approximately 130,000 trees during 2002 and 2003, as only 20,000 trees have been treated to date in addition to any trees that were treated for spruce bark beetles this past spring. <u>Additionally, if less than 20,000 trees are treated in 2002, as is</u> <u>contemplated, this would allow the Permit Holder to treat 110,000</u> <u>trees in 2003 over an area that is smaller than the one that is</u>

permitted. The Panel finds that this is excessive and could lead to harmful results. In particular, there is a limited time frame for the application of MSMA. Care must be taken when applying this pesticide. If a treatment program were undertaken that is more than double the size of the one that was considered by the Respondent when he issued the three-year Permit, there is a greater chance of mistakes and risk to the environment and workers who apply the MSMA. The Panel finds this risk to be unreasonable. Even if it is not a risk, it is unnecessary in the circumstances.

...

The Panel has concluded that the volume of MSMA allowed under the Permit should be reduced by 1/3 or the 50,000 trees that has been agreed to by the Permit Holder. In addition, the volume should be reduced by 5%, or an additional 7,500 trees, to account for the trees that would have been treated in Tweedsmuir Park. Finally, the Panel finds that the reference to the application of MSMA in Tweedsmuir Provincial Park should be deleted from the Permit.

With these amendments, the Panel is satisfied that the application of MSMA under the Permit will not cause an unreasonable adverse affect.

[emphasis added]

The Panel finds that the potential risks associated with MSMA use under the terms of the Permit will be mitigated to a reasonable level if the Permit is amended in accordance with the Board's original findings.

The Panel further finds that the potential risks associated with the fall and burn method, including the higher safety hazard to workers, removal of trees from the forest ecosystem, and increased implementation costs, are greater than the risks associated with the use of MSMA under the Permit, as amended by the Board. Furthermore, as noted above, harvesting infested trees is not a viable option in areas that are considered for MSMA treatment, due to the areas' inaccessibility.

In these circumstances, the Panel finds that non-chemical methods of beetle control are not reasonable alternatives to MSMA use, especially when the relative costs of the fall and burn method is taken into account.

In conclusion, the Panel is satisfied that, with the above noted changes to the Permit, there will be no unreasonable adverse effect on human health or the environment resulting from use of MSMA in accordance with the terms of the Permit.

DECISION

In accordance with the order of the Supreme Court, the Panel has carefully reconsidered all of the relevant evidence regarding viable alternatives, whether or not specifically reiterated here.

The Panel finds that, in the circumstances of this appeal, there is no reasonable non-chemical alternative to MSMA for beetle control, when all of the risks and benefits of the different beetle control methods are taken into account. The Panel further finds that, with the above noted changes to the Permit, there will be no unreasonable adverse effect resulting from use of MSMA in accordance with the Permit.

Accordingly, the Panel confirms the decision of the Deputy Administrator to issue the Permit, subject to the changes ordered by the Board.

The appeal is dismissed.

Alan Andison, Chair Environmental Appeal Board

November 8, 2004