



APPLICATION SUMMARY

Application code:	HRE05002
Application category:	To import or manufacture any hazardous substance under the Hazardous Substances and New Organisms (HSNO) Act 1996
Applicant:	Animal Health Board P O Box 3412 Wellington 6015 Department of Conservation PO Box 10-420 Wellington
Applicant contact:	William McCook (Animal Health Board) Alastair Morrison (Department of Conservation)
Purpose:	Reassessment of sodium fluoroacetate (1080) and substances containing 1080 (a vertebrate toxin). The applicants wish to continue to use 1080 for control of possums, wallabies and rabbits, and for targeted by-kill of rodents and mustelids (mainly stoats)
Date application received:	18 October 2006
ERMA New Zealand contact:	Andrea Eng

Application Summary prepared by Animal Health Board and the Department of Conservation

The Animal Health Board (AHB) and the Department of Conservation (DOC) have submitted a comprehensive application for reassessment under the Hazardous Substances and New Organisms Act 1996 (HSNO) of sodium fluoroacetate (1080) and substances containing 1080 that are used in New Zealand. The reassessment application comprises a hazard classification of 1080 and an assessment of the risks, costs and benefits of using 1080 in New Zealand. The risk assessment has demonstrated significant benefits from the use of 1080. Therefore the applicants seek to continue the current approval for 1080 and substances containing 1080, pursuant to section 63 of the HSNO Act 1996.

1080 is the primary poison used to control possums, wallabies and rabbits as well as for the targeted by-kill of rodents (mainly rats) and mustelids (mainly stoats). AHB uses 1080 to control possums which are the main maintenance host and vector of bovine tuberculosis (Tb) in New Zealand. DOC and regional councils use 1080 to protect and improve the condition of native ecosystems and to enhance conditions for a wide range of native species, including many threatened species. 1080 is widely used because it is a cost-effective poison for controlling pest species, degrades completely in the environment and does not bio-accumulate in food chains. 1080 is the only vertebrate toxin able to be applied from the air in mainland New Zealand and this is its most important use over country that is too rugged or remote to be managed from the ground.



This application brings together 40 years of extensive field and laboratory research on the use and effects of 1080. It has assessed the risks, costs and benefits within the framework of the HSNO Act, using the precautionary principle. The risk assessment demonstrates that there are significant benefits to the environment, market economy and community from the continued use of 1080. Under the current stringent controls on the use of 1080 there are no significant adverse effects on the environment or human health. Without the continued use of 1080 for Tb control and conservation purposes, the most likely alternative control option would be an increased use of cyanide baits and traps. This would lead to a reversal of hard-won gains in Tb control and less protection for native ecosystems and threatened native species.

1. Information on Substance

1.1 Description of 1080

Pure 1080, referred to as the active ingredient, is imported from the USA as a fine white powder from which various bait formulations are made in New Zealand. There are three pellet formulations with different 1080 concentrations (0.4-0.8 g/kg, 1.0 g/kg, 1.5-2.0 g/kg); three paste formulations (0.6-0.8 g/kg, 1.5 g/kg, 10 g/kg); three gel formulations (1.5 g/kg, 50 g/kg, 100g/kg) and a stock solution (200 g/litre) that is used to coat baits, such as carrots. Carrot and pellet baits can be applied from the air, while these and other bait types are also applied manually using a variety of methods. The six hazardous properties that must be considered under HSNO are:

Class 1	Explosiveness
Class 3	Flammability
Class 5	Oxidising capacity
Class 6	Toxicity
Class 8	Corrosiveness
Class 9	Ecotoxicity

Only Classes 6 and 9 apply to 1080, which are classifications as toxic (to people) and ecotoxic (toxic to environmental receptors) under the HSNO Act. The current HSNO hazard classifications for 1080 formulations are summarised in the following table. (In general, a category A substance requires a greater level of control than category B, and so on, in each class).

Approved Substance	Class 6 Toxicity								Class 9 Ecotoxicity			
	6.1	6.3	6.4	6.5	6.6	6.7	6.8	6.9	9.1	9.2	9.3	9.4
	Acute Toxicity	Skin Irritant	Eye Irritant	Sensitisation	Mutagenicity	Carcinogenicity	Reproductive/developmental effects	Target organ toxicity	Aquatic effects	Soil eco-toxicity	Terrestrial vertebrate	Terrestrial invertebrate
Sodium fluoroacetate (technical grade active) 950-980 g/kg	A	B	A				A	A	A		A	A
Pellets containing 0.4 – 0.8 g/kg 1080	C										B	
Pellets containing 1.0 g/kg 1080	C						A		D		B	
Pellets containing 1.5 – 2.0 g/kg 1080	B						A		D		A	
Paste containing 0.6 – 0.8 g/kg 1080	C										B	
Paste containing 1.5 g/kg 1080	B						A		D		A	
Paste containing 10 g/kg 1080	B						A	B	D		A	C
Gel containing 1.5 g/kg 1080	B			B			A		D		A	
Gel containing 50 g/kg 1080	A						A	B	D		A	B
Gel containing 100 g/kg 1080	A	B	A				A	A	A		A	B
Stock solution (soluble concentrate) containing 200 g/litre 1080	A	B	A				A	A	A		A	B

1.3 Use in other countries

1080 is registered for use in Australia, Canada, the USA, Israel and South Africa. All of these countries have valued non-target species, such as native mammals, that are at risk from 1080 use. Consequently, they use less 1080 than does New Zealand and the applications are quite different. For example, in Canada, the USA and South Africa 1080 is primarily used for agricultural purposes in livestock protection collars against predators (e.g. wolves, jackals and coyotes). These and other countries also use a range of other poisons to control pest species. The specific controls in place in other countries for 1080 have little relevance to the New Zealand situation, which has no native mammals at risk but a high number of introduced vertebrate pests.

1.4 Controls on 1080 in New Zealand

There are comprehensive and rigorous systems of regulations and operating procedures that govern 1080 use in New Zealand. It is managed in compliance with HSNO Act regulations covering packaging, transport, emergency management, handling, storage and application. There are further controls on its use under the Agricultural Compounds and Veterinary Medicines (ACVM) Act 1997. Only persons holding an Approved Handler Test Certificate and a Controlled Substance Licence are allowed to apply 1080. Local authorities may impose controls on 1080 application under the Resource Management Act. There are also strict codes of practice covering 1080 operating procedures developed by AHB and DOC. These incorporate experience in risk management and best practice built up over four decades of using 1080 in New Zealand.

2. Comparison of alternative futures

In order to complete a risk-based, cost/benefit analysis of the use of 1080, a future WITH 1080 and a likely alternative approach that would be adopted WITHOUT 1080 are described in detail in the application and the relative benefits and costs of the two alternative futures are compared.

2.1 The future WITH 1080

2.1.1 Current and future outcomes for Tb control

Through a combination of ground control methods and aerial use of 1080, the AHB strategy for containing and eradicating Tb in wild animal populations (and thus controlling herd infection rates) is succeeding. The number of Tb-infected cattle and deer herds has fallen by more than 90% over the past decade. Possums are the main maintenance host for bovine Tb in New Zealand, but only if possum densities are above a certain level. If these foci of infected Tb possums, which with current knowledge are impossible to detect in large remote areas, can be controlled and maintained at a low density level for several years then, *and only then*, is it possible to eradicate Tb from wild animal populations. *All* of the following conditions must be met to achieve this goal:

- uniform reduction of possum densities to low levels;
- density reduction is over large areas (>10,000 ha);
- reduction occurs within a short time (to prevent movement of infected possums);
- possum densities maintained at very low densities for a minimum of five consecutive years.

In many situations, meeting all these conditions can be achieved *only* through aerial applications of 1080 baits. Ground control often fails for the following reasons:

- uniform reduction of possums to low densities cannot be achieved in rugged and difficult forest terrain, enabling foci of infection to persist in uncontrolled patches;

- large areas take a long time to control from the ground, even ignoring difficult operating conditions and costs which provides opportunities for infected juvenile possums to disperse back into controlled areas;
- Because of cost, control quality and size of areas being controlled, low possum densities cannot be sustained over large areas for the length of time required to eradicate infection from the population.

The total possum control area managed by AHB, referred to as the Area Under Sustained Management (AUSM), is about 8.1 million ha. Periodic aerial 1080 operations are used to control possums over about 22% of this AUSM (1.8 million ha). These operations are usually in more rugged or remote areas where it is crucial to contain and eradicate Tb by reducing and holding possum populations at low densities. Aerial application of 1080 is often the only effective method in these areas. Ground control concentrates on protecting buffer zones surrounding farms.

Forecasts by AHB are for the continuing reduction of infection levels in cattle and deer herds *with* use of 1080. By 2015 or earlier, infection levels will be low enough to achieve AHB's goal of 'Official Freedom' from Tb for New Zealand. This requires reducing the Annual Period Prevalence (APP) of Tb to less than 0.2% for three consecutive years (i.e. 99.8% of the 75,000 herds would be Tb-free)¹. In April 2006, the APP value was 0.51% (190 infected herds), but is forecast to drop to 0.17% by 2015 (about 60 infected herds) with use of 1080. In the intervening years there will have been a strategic move towards greater use of aerial 1080 operations to contain and reduce Tb-infected possum populations in rugged or forested areas of the central North Island, NE Hawke's Bay, Wairarapa, Tasman, Nelson, Marlborough, North Canterbury and West Coast. The use of 1080 is key to success in this phase of the Tb campaign and to a final successful outcome.

2.1.2 Current and future outcomes for conservation

Conservation and natural heritage objectives are major responsibilities of DOC and regional councils. This includes improving the health of forest ecosystems by reducing the impacts of browsing, competition and predation by possums well as protecting threatened species from other pests, primarily predators. The use of 1080 is crucial to achieving good outcomes against possums, predators, wallabies and rabbits.

The Area Under Sustained Management by DOC is about 1 million ha, about 80% of which is managed through aerial 1080 operations. Regional councils have a combined AUSM of approximately 2 million ha, about 17% of which is reliant on 1080 use. These areas are mainly forests with high conservation values that are being damaged by possums. The costs of treating these areas from the ground would be more expensive, or else impossible, where the terrain is too rugged or remote. Aerial 1080 use helps to reduce the risks of forest canopy collapse, benefits a wide range of species, and enhances a range of ecosystem benefits from these forests, such as catchment protection. Extensive research and post-operational monitoring has shown that current 1080 aerial operations do not pose a threat to populations of native vertebrate (especially birds) or invertebrate species, in either terrestrial or freshwater habitats.

¹ A full explanation of APP is given in the Glossary, Section 6.2 of the Application.

Aerial 1080 operations have another particularly important advantage over ground control methods. Aerial operations can achieve a high by-kill of rodents (especially rats) and mustelids (especially stoats) which are significant predators of native birds, reptiles and invertebrates. Possums also feed on birds and invertebrates, especially the threatened giant snails (*Powelliphanta* species). If aerial operations are correctly timed they improve breeding success for spring- and summer-breeding forest birds. The acutely threatened species that benefit from possum and predator control are: kokako, mohua (yellowhead), North and South Island kaka, Southern NZ dotterel, Okarito brown kiwi and kakariki (orange-fronted parakeet). Other forest bird species that also benefit from predator by-kill are: other kiwi species, kereru/kukupu (pigeon), tui, bellbird, fantail, whitehead, North Island robin and tomtit

Combined aerial 1080 and ground operations for Tb control and conservation objectives are able to treat much larger contiguous areas at the same time. This benefits both Tb control and the breeding success of forest birds. 1080 is the only poison for use against wallabies (in the central North Island and South Canterbury) and a key one against rabbits. As rabbit resistance to Rabbit Hemorrhagic Disease (RHD) is increasing, farmers and land managers are likely to increase their use of 1080 to sustain the protection of grasslands which was achieved over the last decade by RHD.

In summary, 1080 is a crucially important poison for the control of a range of pest species that are damaging native ecosystems and pastoral lands, or are serious predators of many threatened species. With 1080 use, DOC and regional councils are leading the national effort to achieve the goals of the New Zealand Biodiversity Strategy and regional pest management strategies.

2.2 The alternative future WITHOUT 1080

Without 1080, the most likely alternative option for pest control is to use a mix of traps and cyanide. Both have been widely used for many years. Since 1080 is the only poison registered for aerial use for mainland New Zealand all such control would be by ground methods only.

2.2.1 Future outcomes for Tb control

Without aerial use of 1080, a rapid and uniform reduction in possum densities in rugged forested areas would be impossible. Foci of Tb infection would persist since there would be areas where the residual possum densities would be high enough for possum populations to continue acting as maintenance hosts. To counteract this, the AHB would have to revert to creating low-density buffer zones around farms to reduce the likelihood of Tb possums moving out onto farmland and infecting stock. This would effectively mean forgoing efforts to eradicate Tb from wild animal populations. Consequently, Tb-infected wildlife would spread further through forested regions, including into major disease-free areas such as Bay of Plenty, Coromandel and East Cape. Generalised failure of Tb control would also be likely in Tasman, West Coast and large areas of high country in Marlborough and North Canterbury.

The Area Under Sustained Management by AHB would drop from over 8 million ha to about 5 million ha, but control costs would rise significantly because ground control is generally more expensive than aerial control. New Zealand would not achieve official status as a “Tb free” country. Instead, the Annual Period Prevalence is predicted to rise to around 0.6% by



2015, with a projected increase in the number of Tb-infected herds from 190 to 240. Alternative ground control methods without the use of 1080 would fail to eradicate Tb from wild animal populations. Hence an increasingly expensive effort to contain, but not eradicate Tb, would be required into the indefinite future.

2.2.2 Future outcomes for conservation

Ground control of pests by DOC is, on average, about three times more expensive than aerial 1080 control. Without 1080, therefore, DOC would have to halve the priority areas it manages sustainably from one million ha to approximately 500,000 ha, or even less, depending on costs and other priorities. Regional councils are less reliant on 1080 use than DOC, but there are areas of difficult terrain where councils would also have to forgo pest control. Halving the area DOC was managing sustainably would particularly affect remote and rugged areas. Major non-treatable areas could include large parts of Wanganui, Egmont, Kahurangi, South Westland, and Fiordland national parks, Tararua Forest Park and the Coromandel peninsula. Limited management in these areas would most likely lead to higher mortality of forest trees and other possum-palatable species. Many vertebrate and invertebrate species would suffer higher levels of predation and competition.

Without the by-kill of predators from aerial 1080 operations it would be much more difficult to protect a number of threatened bird species over large areas of forest. Contraction in their ranges would be highly likely as well as increased risks of local extinctions. Those species particularly at risk would be kokako, kaka, kakariki, kiwi species and mohua. Current gains from coordinated operations between all agencies would probably be lost. Wallaby and rabbit control would become more difficult, especially as resistance to RHD continues to increase in rabbits. The overall effect would be a serious set-back in the current initiatives to meet the goals of the New Zealand Biodiversity Strategy, regional pest management strategies and to protect iconic species with which New Zealanders closely identify.

Summary of future outcomes WITH and WITHOUT 1080

1080 use for bovine Tb control	Current	Future WITH 1080 (by 2015)	Future WITHOUT 1080
Total Area Under Sustained management (AUSM) (ha)	8,120,000	8,600,000	5,000,000
Proportion of AUSM reliant on 1080 use	22%	50%(approx)	0
Effectiveness of pest control	Reduce possum densities uniformly & quickly over large areas. Can contain and eradicate Tb in wild animal populations.	Further reductions of infected herds & wildlife and Tb eradication in forested areas. Could then consider Tb eradication on a national scale.	Effective control only within extensive buffer zones. Ground control only provides patchy and slow control in remote and difficult country. Insufficient to contain Tb spread.
No. of infected herds	190	59	238
Containment of infected vector populations?	Yes	Yes	No
Annual cost of vector control	\$55M	\$35-40M	\$55-60M
Annual Period Prevalence (Target = 0.2%)	0.51	0.17	0.58
Official Tb 'free' status achieved?	No	Yes	No
1080 use for conservation by DOC	Current	Future WITH 1080 (by 2015)	Future WITHOUT 1080
Total Area Under Sustained management (AUSM) (ha)	990,000	1,000,000	500,000 (or less)
Proportion of AUSM reliant on 1080 use	33%	33%	0
Pests controlled	Primary control of possums, rabbits & wallabies. Secondary control through by-kill of rodents, stoats and ferrets via aerial 1080 operations.		Primary control of possums only. No by-kill targeting predators.
Habitat/areas protected or at risk	Priority forests and habitats, including many national parks, are managed for several pest species.	Status quo plus extensions to new areas is likely. Higher nos. of native seed dispersers sustains forest dynamics.	Rugged areas not treated may include: Wanganui NP, Coromandel, Tarauras, Kahurangi NP, South Westland, Fiordland.
Species protected or at risk	Acutely and chronically threatened bird species benefit from by-kill of predators. Some threatened plants and animal species benefit directly from possum control, including giant snail species. Many species benefit from reduced competition from possums and other animal pests.		Possible extinctions of: mohua, kakariki, Southern NZ dotterel, and giant snails. Reductions for: kiwi, kaka, kokako, kereru, mistletoe spp.

3. Risk, Cost and Benefit Assessment

A detailed assessment of the benefits and adverse effects of 1080 has been undertaken. This followed accepted methods of risk assessment and gave effect to the precautionary principle through a weighting system that elevated adverse effects to 'significant' more readily than it elevated benefits to 'significant' levels. While a large number of effects were assessed in accordance with ERMA's requirements (Section 4.1) this section summarises only the *significant* effects that were identified (refer Section 4.2).

3.1 Significant effects on market economy

The assessment identified four significant benefits and no significant adverse effects to New Zealand's market economy *with* the use of 1080. There are two significant benefits for pastoral farming. The first benefit (M-B4) is the reduced costs to farmers through reduced constraints on the sale and movement of livestock as Tb levels fall. The second significant benefit (M-B5) is reduced competition for grazing from rabbits, wallabies and possums. The major impact on pasture is from rabbits and 1080 is the most effective poison for rabbit control.

The other two significant benefits are to the domestic economy. Reduced costs to the agricultural sector and government associated with Tb vector control (M-B7) reflect reductions in vector control costs with ongoing use of 1080, compared with higher ongoing costs if 1080 is not available and only trapping and cyanide is used. The predicted cost saving for vector control over the next 10 years is \$50-\$100M with 1080. By 2025, the difference in control costs could increase to \$40M/year, reflecting the predicted decline in Tb levels and control costs with ongoing 1080 use. The fourth significant economic benefit is the decreased likelihood of loss of export markets due to market perceptions of New Zealand's Tb status (M-B10). Given the approximately \$8 billion value of New Zealand's dairy and meat product exports, perceptions of risk of Tb that led to any loss of access to overseas markets could have severe consequences. Continuing the current trend towards Tb-free status with 1080 use should have a positive effect on market perceptions, in contrast to possible negative perceptions following a rise of Tb incidence without 1080.

3.2 Significant effects on social and community

One significant benefit and no significant adverse effects were identified for social and community effects *with* 1080. Two adverse effects with 1080 were highlighted and discussed further because they are considered contentious even though they did not rank as 'significant'. The significant benefit is the enjoyment of recreational activities that rely on maintenance of healthy forest habitat and native biodiversity (S-B5). New Zealanders' outdoor recreational experience on public land is more enjoyable when it occurs in healthy forests and places with an abundance of native wildlife, and bird song. This is more likely from pest control with 1080 use given its greater effectiveness and application over larger areas than the alternatives of traps and cyanide without 1080.

One contentious adverse effect with 1080 is the loss of opportunity to hunt due to reduced deer populations (S-A1) and the need for hunters to avoid taking game from 1080 treated areas for a period of time. Deer populations can be reduced by 1080 operations, although the extent of these by-kills is highly variable. Recovery to pre-poison levels has been

reported to occur within 2 years and population reductions are likely to be in localized areas. This assessment may change as a deer repellent, currently under trial, may prove effective at reducing the level of deer by-kill.

The other contentious adverse effect is the anguish and grief at suffering or loss of highly valued companion animals (pets) with 1080 (S-A6). Cats and dogs (in particular) run the risk of secondary poisoning from scavenging poisoned carcasses. This risk is reduced by advising owners to exclude pets from areas where 1080 has been applied through the obligatory use of warning signs. 1080 operators may also issue muzzles and emetics (for dogs). By pet owners adhering to the warnings and controls the number of pet fatalities is very low with 1080.

3.3 Significant effects on human health and safety

No significant benefits or adverse effects were identified *with* 1080 use for human health. However, the potential for public exposure to 1080-contaminated water was considered a contentious issue (H-A14) and is therefore discussed in more detail. There are public concerns relating to potential contamination of drinking water supplies following aerial 1080 operations. Controls over aerial application require aircraft to avoid major water bodies or waterways that flow into potable water supplies. Scientific analysis of 1,649 water samples taken from streams after aerial operations over a 14 year period (1990-2003) found no trace of 1080 in 96.5% of the samples. Only 5 samples (0.3%) had 1080 levels over 2 parts per billion and these residues were transient. A 60kg person would need to drink 2,300 litres of water containing 2 ppb of 1080, every day, for some weeks, for sub-lethal effects to occur. All of the 107 samples taken from reticulated town water supplies were free of detectable 1080.

In the scenario *without* 1080, however, three significant risks to human health were identified from the increased use of cyanide. These involved occupational exposure risks (H-CN-A10 and H-CN-A12) and public exposure to ingestion of cyanide baits (H-CN-A11). These risks arise because of the high toxicity of cyanide.

3.4 Significant effects on environment

Six significant benefits and no significant adverse effects have been identified for the environment *with* the use of 1080. The first two significant benefits are from reduced browsing pressure from pests, which benefits vulnerable plant species and increases the health of native ecosystems and habitats (E-B1 and E-B2). Without 1080, possum control would contract to localized representative sites, removing current protection from large areas and from vulnerable plant species and ecosystems. The next two significant benefits with 1080 describe the importance of 1080 in reducing predation pressure from rats, stoats and feral cats on:

- three acutely threatened species that face extinction (mohua, kakariki (yellow-fronted parakeet) and Southern NZ dotterel (E-B4),
- other acutely threatened species (North Island kokako, kaka, Rowi/Okarito brown kiwi),

- chronically threatened species (North and South Island brown kiwi, great spotted kiwi and kereru/kukupa), and
- common species such as tui, bellbird, fantail and whitehead (E-B5).

Without 1080 all of these bird species would face local population declines and some would face increased risk of extinction.

Another significant benefit identified with 1080 use is the reduced competition for food supply and some habitat resources for native birds, particularly threatened species (E-B6). Research has shown that possum feeding behaviour, by concentrating their seasonal feeding on flowers, fruits and invertebrates, reduces the food supply for many native birds as well as their chicks. Rats and mice are also important competitors for food. Bird breeding success is consequently likely to be lower without 1080 as smaller forested areas would be managed. As well as bird species, the iconic *Powelliphanta* land snails have been identified as benefiting significantly with 1080 use (E-B10). There are several species of *Powelliphanta* now classified as nationally critical or nationally endangered species. Research has linked these declines largely to possum and rat predation. Without 1080, snails could not be protected over large and remote land areas by broadscale 1080 operations.

The more widespread use of cyanide and traps *without* 1080 presented an unacceptable risk to weka, classified as an acutely threatened species. (E-CN-A15). DOC has prohibited most uses of Feratox and ground set traps on public conservation land where weka are known to be present, but weka would still be at risk outside known ranges and off public conservation land. Further restrictions might be warranted to reduce the capture rate of weka in traps (E-TR-A1) in the without 1080 alternative future.

3.5 Risks, cost and benefits to Maori

There was national consultation with Maori to ascertain their views on the risks, costs and benefits to Maori of using 1080. Maori views need to be considered in the context of the holistic approach that is central to Maori knowledge systems. From a Maori perspective, environmental outcomes need to be considered as interrelated to cultural outcomes along with human health and wellbeing concerns. Thus the environmental outcome from 1080 use of improved wellbeing for forests and bird species is reluctantly accepted by some Maori, strongly by others, but the view is also held that aerial 1080 operations, in particular, violate wairua and mauri. Therefore in a spiritual context Maori are generally opposed in principle to aerial operations and to the use of toxins which are perceived as a pollution of the environment. Protection of mauri is a concern not only for land, but also for waterways.

Maori would like more research on the uptake of 1080 by iconic taonga species, particularly food sources and rongoa species (traditional medicines). At a socio-economic level the by-kill of deer and pigs is an adverse effect in some rural communities where they are a food source. Yet it was also generally agreed by Maori that removing possums is desirable for the restoration of natural habitats. There is, however, a strong preference for alternative methods of control and also greater employment opportunities for iwi as part of maintenance activities.



4. Proposed Management

During the 40 years that 1080 and 1080 products have been used in New Zealand a comprehensive and rigorous set of controls and codes of practice have been developed. Ongoing strict adherence to these current procedures will continue to protect human health and minimise any potential negative environmental effects. The risk assessment has identified no significant risks arising from the use of 1080. Since current procedures are managing the risks adequately, no further controls are recommended by the applicants.

5. Conclusion

This risk assessment of the use of 1080 products in New Zealand presents the evidence for continuing the current approvals for 1080 and substances containing 1080. It examines the unique international context within which 1080 is presently used in New Zealand and why the use of 1080 has become an integral and vital tool for pest management agencies. The use of 1080 is central to both the goal of eliminating bovine Tb from New Zealand and to halting the decline in New Zealand's native biodiversity.

This assertion is supported by a full analysis of the risks, costs and benefits of 1080 use and from the analysis of the most likely alternative option of using a mix of traps and cyanide if 1080 was not used. The assessment showed that, when 1080 is used within the comprehensive framework prescribed by regulations, controls and best practice, then significant benefits accrue to the environment, market economy and community without any significant adverse effects. There are no significant adverse effects for human health despite expressions of public concern relating to potential contamination of public water supplies. The continuing use of 1080 is vital to the campaign to rid New Zealand of bovine Tb. It remains a key poison in the efforts of management agencies to improve the health of native species and ecosystems, as well as pasture, by controlling a range of introduced pest animals.