

**Issuing Permissions
for the Use of
Vertebrate Toxic
Agents (VTAs)**
Guidelines for Public Health Units

Revised Edition 2010

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MANATU HAUORA

Preface

Vertebrate pest control is an important part of efforts to protect New Zealand's native flora and fauna, to prevent the spread of diseases and to reduce the impact of pest damage to crops and pasture. Compared with other countries, New Zealand uses large amounts of vertebrate toxic agents (VTAs) to control animal pests, in particular, 1080. The magnitude of the animal pest problem in New Zealand, and the nature and size of the terrain involved, means that targeted pest management such as hunting or non-toxic trapping methods cannot adequately control pest numbers in defined areas nor prevent the spread of those pests. Landcare Research estimates that there are approximately 60 million brush-tail possums in this country, spread over 95 percent of the land. In the absence of other suitable control methods, VTAs are the first line of management of pest populations.

The use of VTAs will continue in the foreseeable future, requiring an ongoing and consistent commitment to proper use of regulatory controls on VTAs in order to minimise risks to population health.

By definition, VTAs are toxic agents intended to kill target species, but they are also toxic to humans both through acute poisoning and chronic exposure. Methods for VTA use have improved over the last few decades, for example, global positioning systems (GPS) are now used to enable more targeted aerial applications, and the types and application of bait have improved. Despite these improvements, the use of VTAs, in particular 1080, causes significant concern in some communities.

Public health units have a key role to play in protecting public health from health risks associated with VTA use. In order to use certain VTAs, operators must apply for permission from the local public health unit, and they have a legal obligation to comply with any conditions that the public health unit should apply to that permission. These guidelines provide practical advice to public health units setting conditions on permissions to use VTAs, using Model Permit Conditions.

The specific characteristics and risk profile of each VTA operation differ, depending on the VTA being used, the terrain and factors such as public use patterns and/or proximity to dwellings and water supplies. The Model Permit Conditions may need to be modified in order to adequately manage the level of the risk to public health.

The Ministry of Health would like your comments on the implementation of these guidelines. If you would like to make specific suggestions for amendments to the guidelines, please copy and fill in the suggestions sheet provided below and send your comments to the address included at the bottom of the sheet. Suggestions and comments will be considered in the next reprinting of these guidelines.

Suggested Amendments to Issuing Permissions for Vertebrate Toxic Agents (VTAs): Guidelines for Public Health Units

Name

Organisation

Address

Section	Page	Amendment requested (include rationale)

Signature:

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Introduction

Background

These guidelines provide practical information on how to identify and manage the public health hazards and risks associated with the use of the following vertebrate toxic agents (VTAs):

- all substances containing sodium fluoroacetate (1080)
- potassium cyanide
- sodium cyanide
- yellow phosphorous
- 3-chloro-p-toluidine hydrochloride (DRC 1339).

The use of VTAs, including 1080, is covered by the Hazardous Substances and New Organisms Act 1996 (the HSNO Act). Under the HSNO Act, operators intending to apply certain VTAs must obtain permission from a warranted HSNO enforcement officer (an officer) from a public health unit in the area of the proposed VTA operation. Under this regime, officers have the discretion to apply conditions to permissions to ensure that public health risks are assessed and managed effectively.

In order to help officers in using their discretion to impose conditions on permissions to use VTAs, the Ministry of Health (the Ministry) developed the original Model Permit Conditions in 1994/95. The Model Permit Conditions aim to help officers manage the risk to public health resulting from the use of VTAs in pest control operations.

Purpose of the guidelines

Properly applied, these guidelines will assist officers in:

- assessing the hazard and risks posed by a proposed VTA operation
- applying the appropriate Model Permit Conditions
- modifying the Model Permit Conditions in response to the specific risk profile of each VTA operation.

The guidelines will also help officers to appropriately communicate the risks of these operations to affected parties.

Using the Model Permit Conditions

The Model Permit Conditions are intended as a starting point. They should not be applied as a generalised standard 'set' of conditions. They provide a framework that officers can adjust in order to meet local needs. However, officers need to ensure that they fully consider the various risks and characteristics of each specific proposed VTA operation in order to determine the appropriate Model Permit Conditions to be used and how such conditions might need to be modified to adequately manage the public health risks posed by that particular operation.

Recording decisions on VTA applications

Officers' decisions regarding the Model Permit Conditions to be used with VTA permissions are based on statutory authority and may be subject to judicial review. This further highlights the importance of making sound decisions in regard to the appropriate use and modification of Model Permit Conditions. Officers should ensure that they keep a full record of their decision-making process to support the rationale of their decisions.

Application and exclusions

These guidelines apply only to VTAs that require public health permission for application, that is:

- all substances containing sodium fluoroacetate (1080)
- potassium cyanide
- sodium cyanide
- yellow phosphorous
- 3-chloro-p-toluidine hydrochloride (DRC 1339).

Other commonly used VTAs such as pindone and brodifacoum do *not* require public health permission and are *not* covered by these guidelines.

VTA operators must be aware of and comply with all relevant legal obligations. The conditions of a VTA permission are legally binding, however, compliance with conditions does not necessarily mean that operators have met all legal requirements for VTA use.

Physical hazard: flying bait

Operators have recounted numerous instances of people being hit by 1080 bait pellets during aerial operations. Injuries would be possible from such occurrences due to the size and speed of the pellets, but there have been no confirmed reports of such incidents to date.

These guidelines do not cover the physical hazards posed by flying bait because the warning signage placed around an area to be baited should inform people that an aerial operation will be occurring in the immediate area. Any reports of people being struck by bait should be referred to the operator.

Note: The hazard posed by flying bait is significantly less than that posed by the toxicity of the baits themselves.

Occupational hazards

Occupational hazards are not covered in these guidelines because they are covered by the Department of Labour (DoL) under the Health and Safety in Employment Act 1992 (the HSE Act). Such hazards include (but are not limited to) workers being exposed to VTAs as part of their work and workers being exposed to dust during loading operations.

VTAs in food

Ingestion of VTAs through food (eg, eating feral animals that have consumed a VTA before being shot or trapped) is covered by the New Zealand Food Safety Authority (NZFSA). For specific information, go to the ACVM register at: <https://eatsafe.nzfsa.govt.nz/web/public/acvm-register>, search for the appropriate VTA and click on 'Conditions' to find the specific NZFSA requirements for the use of that VTA.

Non-target species

VTAs present a hazard for non-target species, including deer, pigs, birds and feral stock. These guidelines do not identify hazards for such species nor offer suggestions for managing the attendant risks; however, officers should be aware that there are often significant public concerns about VTA impacts on non-target species.

When considering the use and/or modification of Model Permit Conditions, it is important to clearly differentiate between hazards to human health and hazards to animal health. In terms of recognising potential breaches of those conditions, officers should use information on impacts on non-target species (particularly domestic animals) as pointers to inappropriate or unlawful VTA use.

1080 reassessment

The use of VTAs, particularly aerial application of 1080, is often controversial among groups who believe that the risks of VTA use outweigh the benefits. In response to these concerns, in 2007, the Environmental Risk Management Authority (ERMA) conducted a reassessment of the use of 1080 that approved the continued use of 1080 while imposing more stringent controls.

The ERMA reassessment decision is available at: http://www.ermanz.govt.nz/news-events/1080/Decision%20_2007.08.10_%20FINAL.pdf

Risk analysis

A public health risk-analysis model is outlined in *A Guide to Health Impact Assessment* (Public Health Commission 1995) and forms the basis for these guidelines.

There are three sequential steps in the decision-making process regarding risk:

1. Risk assessment
2. Risk communication
3. Risk management.

These guidelines consider assessment and management of the potential impacts of VTA operations, using a Health Impact Assessment (HIA) approach. For more information on HIA, officers should consult the Public Health Advisory Committee health impact assessment guidelines (Public Health Advisory Committee 2005) and use the risk assessment tools provided in the course for HSNO warranted officers.

Risk assessment asks the following questions:

- What are the risks?
- Who will be affected, how and to what extent?

Risk assessment includes:

- Hazard identification
- Dose-response assessments
- Exposure assessment
- Risk characterisation.

If the assessment of the hazard suggests that there is a small likelihood of significant risk or control is straightforward and safe, it may not be necessary to proceed to quantifying the risk.

The next two steps in risk assessment are considering dose response and assessing exposure to the various VTAs. Dose-response models are developed from epidemiological data, although it should be noted that these data are limited in most hazardous substances. (See Chapter 2: Risk Communication for more information.)

The information from the three risk assessment steps described above is used in the final step of risk assessment – risk characterisation.

The acceptability of risk is a decision for either individuals involved in the risk or society as a whole. Various scientific and regulatory bodies set levels of what they consider to be acceptable risks, but there is no certainty that these levels will be understood or accepted by people.

During any communication of risk, there must be adequate consultation on the risks, and public concerns must be acknowledged. Risk management seeks to address the following questions:

- How can risks be avoided or reduced?
- What are the options in avoiding or reducing risks?
- Are contingency and emergency plans adequate?
- How can differing perceptions of risk be mediated?
- Can future health risks be predicted?
- What can we learn from past experiences?

Chapter 1: Hazard Identification, Dose Response, Exposure Assessment and Risk Characterisation

Main points

- All VTAs are, by definition, hazardous and pose a risk to human health.
- Children are most at risk from exposure to VTAs due to their relatively small body mass and tendency to pick up and eat unidentified items from anywhere.
- The VTAs covered by these guidelines vary in their toxicity to humans and require different controls to ensure the hazards are properly identified and the risks adequately managed.
- VTA risks can be exacerbated by incorrect or unsafe use, including use that does not conform to permit conditions or operations for which the conditions are not sufficiently robust.
- Research into the impact of VTAs on humans and the environment is ongoing.

Introduction

VTAs have been used in New Zealand for many decades to kill introduced vertebrate pests, including possums, rabbits, rodents, wallabies and rooks; to control the impact these animals have on pasture, native flora and fauna; and to control the spread of tuberculosis from possums to cattle and farmed deer. Some VTAs, particularly sodium cyanide, are also used for commercial skin and fur recovery operations.

In order to be effective, all VTAs are, by definition, toxic to the target species and, in most cases, to humans. Depending on the specific VTA, exposure to small amounts of some VTAs (eg, cyanide paste) can present a significant hazard to humans.

Hazard identification and dose response

The ERMA reassessment decision is available at: http://www.ermanz.govt.nz/news-events/1080/Decision%20_2007.08.10_%20FINAL.pdf and the Hazardous Substances (Vertebrate Toxic Substances) Transfer Notice 2004 (as Amended) list the HSNO hazard classifications for preparations containing VTAs: <http://www.ermanz.govt.nz/hs/transfer/docs.html>.

Sodium fluoroacetate (1080)

Hazard identification and dose response

Sodium fluoroacetate (1080) is highly acutely toxic. It kills by disrupting the metabolic system, leading to heart and central nervous system failure. Symptoms of acute 1080 poisoning include nausea, vomiting and abdominal pain followed by respiratory distress, anxiety and agitation; central nervous system disorders such as muscle spasms; stupor; seizures; and coma. Hypertension is thought to be one of the more important predictors of mortality in 1080 poisoning. Symptoms typically appear between 30 minutes and 2–3 hours after oral ingestion.

1080 is also a skin and eye irritant.

There are limited data on the effects of 1080 on humans, therefore, most information relates to studies on other mammals.

Based on fatal or near fatal cases of human poisoning, the range of dangerous doses of 1080 for humans in terms of acute toxicity is estimated at between 0.5 and 2.0 milligrams per kilogram of body weight (mg/kg bw). The estimated minimum lethal dose in humans is 0.7 mg/kg bw.

The acceptable daily exposure (ADE) for formulated substances containing 1080 is 0.02 µg/kg bw/day. The ADE is similar in intent and definition to tolerable daily intake (TDI).

The heart is a major target organ for 1080, with rat studies demonstrating cardiomyopathy after prolonged exposure. The no observed adverse effect level (NOAEL) for cardiomyopathy is estimated at 0.075 mg/kg bw/day; the lowest observed adverse effect level (LOAEL) is estimated at 0.25 mg/kg bw/day.

1080 is a reproductive toxin and is teratogenic. However, as there are no known studies of these effects in humans, data are extrapolated from animal studies. In male rodents, reproductive effects were noted (NOEAL = 0.1 mg/kg bw/day; LOAEL = 0.33 mg/kg bw/day). Rat studies showed no signs of maternal toxicity.

Evidence from rat studies indicates that 1080 is not genotoxic.

Further information on 1080

- *Evaluation and Review Report: Reassessment of 1080 (HRE05002)*, Appendices B (Toxicity of 1080) and M (Exposure and risk assessment: human health) available on ERMA New Zealand's website: <http://www.ermanz.govt.nz/BertDocs/HRE05002-044.pdf>
- *Controls for Formulated Substances Containing Sodium Fluoroacetate (1080)* available on ERMA New Zealand's website: <http://www.ermanz.govt.nz/news-events/1080/controls%20document.pdf>
- *1080 Vertebrate Toxic Agent Used for Possum Control in Forests and Bush Areas* available on the NZFSA's website: <http://www.nzfsa.govt.nz/consumers/chemicals-nutrients-additives-and-toxins/1080/index.htm>
- *Vertebrate Pesticide Toxicology Manual* available on the Department of Conservation (DoC's) website: <http://www.doc.govt.nz/upload/documents/science-and-technical/docts23.pdf>
- *Veterinary and Clinical Treatment of Vertebrate Pesticide Poisoning – a Technical Review* available on the Animal Health Board's website: <http://tbfree.ahb.org.nz/LinkClick.aspx?fileticket=S8p0c4%2BDm8w%3D&tabid=206>

Cyanide

Hazard identification and dose response

Cyanide is highly acutely toxic. It kills by preventing the use of oxygen in the body, leading to respiratory and cardiac failure. A lethal dose of cyanide can kill in minutes.

Symptoms of acute cyanide poisoning include seizures, hypoxia and cardiac arrest and coma, all within minutes of ingestion or exposure to gaseous hydrogen cyanide. At a sub-lethal dose, a person may feel weak, dizzy, confused, complain of headache and nausea and vomit. Difficulty breathing and progression to unconsciousness follow, depending on the dose. The affected person may have a bright red face and blue extremities, due to poor oxygen uptake.

Cyanide is not known to have teratogenic effects, or be a carcinogen. It does not accumulate in the body; therefore, chronic exposure comes from constant low-level ingestion or exposure through diet or continuously contaminated drinking-water. The scientific literature suggests that repeated exposure to substantial sub-lethal amounts of cyanide could potentially cause lasting neurological effects, goitre and hypothyroidism. Survivors of acute cyanide poisoning may develop cardiac and brain damage.

Based on case report studies, the following acute median-lethal exposure levels for humans were estimated: a LC₅₀ of 524 parts per million (ppm) for a 10-minute inhalation exposure to hydrogen cyanide, a LD₅₀ of 1.52 mg/kg for the oral route and a LD₅₀ of 100 mg/kg for the dermal route, assuming that cyanide anion is readily released from the compound. Animal studies also report dyspnoea, convulsions and asphyxiation as effects of high-acute exposure to cyanide by any route of exposure. Cyanide is metabolised extensively in the liver, indicating that the only relevant route of administration for quantitative risk assessment in the derivation of a TDI is the oral route.

Human data do not provide adequate information from which to derive a TDI because effective dose levels of chronically ingested cyanide are not documented. The highest reported NOAEL for cyanide, 10.8 mg/kg/day, was chosen for the derivation of a ADE for cyanide of 0.02 mg/kg/day.

Further information on cyanide

- *Evaluation and Review Report: Reassessment of 1080 (HRE05002)*, Appendix M (Exposure and risk assessment: human health) available on ERMA New Zealand's website: <http://www.ermanz.govt.nz/BertDocs/HRE05002-044.pdf>
- Agency for Toxic Substances and Disease Registry (ATSDR). 2006. *Toxicological Profile for Cyanide*. Atlanta: US Department of Health and Human Services. Public Health Service.
- *Advisory Notes on Cyanide Poisoning* available on the Ministry of Health's website: <http://www.moh.govt.nz/moh.nsf/indexmh/environmentalhealth-cyanide>
- HSNO Chemical Classification Information Database: Sodium cyanide available on ERMA New Zealand's website: <http://www.ermanz.govt.nz/Chemicals/ChemicalDisplay.aspx?SubstanceID=1940>

- *Vertebrate Pesticide Toxicology Manual* (Feratox® only) available on DoC's website: <http://www.doc.govt.nz/upload/documents/science-and-technical/docts23.pdf>
- *Veterinary and Clinical Treatment of Vertebrate Pesticide Poisoning – a Technical Review* available on the Animal Health Board's website: <http://tbfree.ahb.org.nz/LinkClick.aspx?fileticket=S8p0c4%2BDm8w%3D&tabid=206>

Yellow phosphorous

Hazard identification and dose response

The hazards from human exposure to phosphorous are acute toxicity and skin and eye burns/irritation. Yellow phosphorous kills through severe acute liver damage and/or heart failure. The initial signs of phosphorus poisoning are severe abdominal pain, nausea, vomiting, dizziness, headache and a garlic odour on the breath. A large sub-lethal dose may cause liver damage.

Chronic poisoning in humans leads to toothache followed by swelling of the jaw and then necrosis of the mandible (colloquially known as 'phossy jaw'). This condition may be the only clinical sign from mild exposures to phosphorus. It can often take years to develop, and its pathogenesis currently is unknown, although higher repeat doses also cause liver and kidney damage. Signs of chronic high exposures to phosphorus are weakness, weight loss, anaemia, loss of appetite and spontaneous fractures.

The LD₅₀ for yellow phosphorous in human is 2 mg/kg. In rats, the NOAEL for yellow phosphorous is 0.015 mg/kg bw/day and a LOAEL of 0.075 mg/kg bw/day, with critical effects being forelimb hair loss and parturition mortality. The oral TDI is 0.02 µg/kg bw/day.

Rat studies indicate that yellow phosphorous is not genotoxic or carcinogenic.

Further information on yellow phosphorous

- Agency for Toxic Substances and Disease Registry (ATSDR). 1997. *Toxicological Profile for White Phosphorous*. Atlanta: US Department of Health and Human Services, Public Health Service.
- *Vertebrate Pesticide Toxicology Manual* available on DoC's website: <http://www.doc.govt.nz/upload/documents/science-and-technical/docts23.pdf>
- *Veterinary and Clinical Treatment of Vertebrate Pesticide Poisoning – a Technical Review* available on the Animal Health Board's website: <http://tbfree.ahb.org.nz/LinkClick.aspx?fileticket=S8p0c4%2BDm8w%3D&tabid=206>

DRC 1339 (3-chloro-p-toluidine hydrochloride)

Hazard identification and dose response

DRC1339 is acutely toxic and harmful if swallowed, inhaled or absorbed through the skin. It is also corrosive to both skin and eyes. Repeated oral exposure may cause reproductive or developmental damage; however, there is limited detailed knowledge about the effects of DRC 1339 on humans.

From an acute oral toxicity study with rats, the LD₅₀ has been estimated to be 350 mg/kg for males and 302 mg/kg for females. It is highly toxic to many bird species, in particular to starlings, with an acute LD₅₀ of 3.8 mg/kg reported, but is less toxic to most other birds.

The ADE was reported to be 0.086 mg/kg/bw/day. A NOAEL of 43 mg/kg bw/day was reported, but no details on toxicity data were provided (ERMA New Zealand 2002).

Further information on DRC 1339

- Animal Control Products Ltd. 2006. *Safety Data Sheet: DRC 1339* available at: <http://www.pestoff.co.nz/msd/drc.pdf>
- *Controlled Pesticides: DRC 1339 for bird control* available on the NZFSA's website at: <http://www.nzfsa.govt.nz/acvm/publications/notes/drc1339-bird-study-notes.pdf>
- The United States Environmental Protection Agency, National Service Center for Environmental Publications (NSCEP) and National Environmental Publications Internet Site (NEPIS) – EPA's Gateway to Free Digital and Paper Publications available at: <http://www.epa.gov/nscep/>

Exposure assessment and risk characterisation

Knowledge of exposure is essential for environmental epidemiology and hazard control. The potential exposure pathways can be assessed on the basis of the details of applications to carry out VTA operations and form a vital part of the process of identifying, applying and where necessary modifying Model Permit Conditions.

Risk characterisation necessarily includes assumptions and uncertainties that need to be identified and managed appropriately, using the available information, although the application requirements provide extensive information on the planned operation. In some cases, officers may need additional information to build up a picture of the operation that is detailed enough to ensure protection of public health.

The hazards of VTAs have been set out earlier in this chapter. Generally, 1080 and cyanide present more of a risk to public health than DRC 1339 and yellow phosphorous due to their acute toxicity and frequent, widespread use.

Exposure varies between VTAs and depends on the method of application and presentation of the baits. The risk of exposure is also influenced by the terrain in the operational area and its proximity to residential and/or recreational areas.

Oral exposure

For each of the VTAs covered by these guidelines, the most significant acute exposure risk to members of the public is oral ingestion following direct contact with VTA baits, for example, an unsupervised young child picking up and eating poisoned bait. Most of these baits contain doses of the VTA sufficient to kill a member of the target species. While this may mean that bait would have less effect on a human adult than on the target animal, a young child would be seriously affected by ingesting bait.

The risk posed to children through oral ingestion depends on the bait formulation being used. A 14 kg child would need to consume 9.8 mg of 1080 (approximately just over a 6-g bait containing a 0.15 percent concentration of 1080) to reach the lowest end of MLD of 0.7 mg/kg bw. Due to its toxicity and rapid action, ingestion of cyanide bait presents a greater risk than 1080, yellow phosphorus or DRC 1339. A 14 kg child would receive a fatal dose of cyanide from one-quarter of a pea-sized Feratox® cyanide pellet.

The greatest risk to drinking-water supplies may occur during VTA distribution operations, particularly aerial 1080 operations, either due to major accidental spillage of bait into a water supply or the incomplete or inaccurate identification of water supplies before an operation. These scenarios could see bait entering waterways that should have been covered by exclusion zones.

There is also the potential for all VTAs to pollute drinking-water supplies through rain leaching the poison into the waterway from bait that is lying on the ground or from poisoned carcasses lying on the ground and/or through poisoned carcasses falling into waterways.

The concentration of 1080 in a waterway will depend on a number of factors, including the flow rate of the waterway, rainfall, the sowing rate, the amount of bait entering the waterway and the distance between the point at which the bait entered the water and the drinking-water intake point. It can be difficult to give precise calculations for all these factors, and such calculations can vary between seasons and between different parts of the same catchment. As a result, exclusion zones, testing regimes and mitigations (eg, provision of alternative supplies) should be used to limit any risk posed by the VTA.

Cyanide is readily water soluble and degrades rapidly in the environment. It is favoured by hunters as it kills rapidly and close to the bait station or placement point, making it unlikely that poisoned animals would enter waterways, with the exception of carcasses being washed in by rain. Note: Deaths of dogs or other domestic animals may indicate improper use of cyanide and the presence of a hazard to human health, particularly if signage is inadequate or is being disregarded.

Although an uncommon exposure route, mouth-to-mouth resuscitation of humans who have ingested cyanide is extremely hazardous.

While yellow phosphorous bait is ground laid and thus could easily be ingested (again most probably by children), it degrades rapidly once in contact with air, and thus exposure is likely to be less and it is unlikely to contaminate drinking-water supplies by being washed or rolling into drinking-water sources. However, operators must give careful consideration to bait accessibility and placement before any placement operation.

DRC 1339 could be ingested if bait fell from nests or was applied on the ground and then picked up and eaten. Mitigation measures can include keeping strict observations of the placed bait and removing any untaken bait, where possible, once birds have stopped feeding, and removing any dropped bait.

DRC 1339 is soluble in water; however, if DRC did enter waterways, it would dissolve into the water and could potentially enter drinking-water *if* the waterway was a drinking-water source. However since DRC is dropped by hand or helicopter directly into birds' nests, it's highly unlikely to come into contact with waterways. It's also used very infrequently, further reducing the risk of exposure through water. Pellet forms of DRC 1339 (eg, Starlicide) are not water soluble. Therefore, even if they did enter water, they would not dissolve. The risk of human exposure through contaminated water is very low with the use of these types of formulations.

Deliberate ingestion of bait does occur, though this is not a hazard that can be managed through the Model Permit Conditions. Breaches of HSNO controls on VTAs (eg, sales to a person who does not hold a controlled substances licence) would be investigated and dealt with by the appropriate HSNO enforcement agency.

Inhalation exposure

Non-occupational exposure to VTAs may occur through inhalation of fumes from bait, particularly cyanide.

1080 is readily absorbed through inhalation. Dust containing 1080 from laced bait may be present around loading sites; however, these sites should be restricted and non-occupational inhalation exposure should not occur. A person (particularly a child) may pick up and sniff a poisoned bait; however, the amount of 1080 on a bait is small, and the hazard is limited compared to oral exposures.

Cyanide has a bitter almond odour, though not everyone will notice and/or recognise the odour. Gaseous cyanide presents the greatest potential risk due to its toxicity; however non-occupational exposure to gas from cyanide bait is unlikely.

Yellow phosphorous is toxic if inhaled. However, as it degrades rapidly, the risk is low where a member of the public could be exposed with bait which has been in contact with the air for a sufficiently short period of time to still emit harmful vapour. The main risk for non-occupational inhalation exposure to yellow phosphorous would be to a person (most likely a child) picking up and sniffing a freshly laid bait.

There is very limited information on the inhalation effects of DRC 1339. In its concentrate form it is corrosive and is toxic when inhaled; however non-occupational inhalation exposure to DRC 1339 should not occur if the poison is properly stored and used. When presented in pellet form, the risk is further reduced.

Dermal exposure

1080 is a skin irritant, but it is not well absorbed by intact skin. Absorption may be greater in the presence of dermatitis or another skin injury, particularly cuts or abrasions on exposed areas when handling the bait. Unsupervised children are most at risk from dermal exposure to 1080 because they are more likely than adults to have cuts or abrasions, and are more likely to pick up and handle bait.

Cyanide is extremely toxic and readily absorbed through the skin, particularly broken skin. Members of the public may be at risk if they brush against a gel or paste bait or handle bait. Again, this is particularly relevant to unsupervised children.

Yellow phosphorous is corrosive to the skin, causing burns. However, the risk of dermal exposure is low due to the limited use of yellow phosphorous and its rapid deterioration once exposed to air.

There is very limited information on the risks associated with dermal exposure to DRC 1339 other than that it is corrosive, particularly in its concentrated form (eg, before it is applied to bait). Potential exposure pathways may include ground-laid bait or fallen bait being picked up; however, given that DRC 1339 sees very limited use, normally on private land, there is low potential for exposure through handling.

Chapter 2: Risk Communication

Main points

- Risk communication is an important part of all VTA operations but is especially important for 1080 aerial operations.
- Officers will primarily communicate risks in response to public enquiries or complaints about VTA operations.
- In communicating risks to the general public, officers need to be empathetic, sensitive to the ways in which people perceive risk and well informed.
- Officers may also need to provide guidance to operators on risk communication.

Risk communication

It is important that officers accurately and effectively communicate the risks of VTAs and VTA operations. More than any other type of VTA operation, officers will be required to communicate with the public on 1080 applications, particularly aerial 1080 applications.

There are two main ways of communicating the risk of VTA operations that require permissions:

- officers responding to public inquiries or complaints about operations
- operators notifying the public about operations and risks (as required by regulations, consents and permit conditions).

General guidance

The general public perceives risk in social and psychological terms rather than in technical terms. Risk communication must understand and be sensitive to this perception and aim to inform, show responsiveness and be a two-way process. When communicating risks, it is important for officers to show commitment, be open, demonstrate knowledge and be empathic.

The general public does not base their perception of risk on technical risk assessment alone. Public recognition of risk, in contrast to risk assessment based on probabilities prepared by experts, includes intuitive risk perception related to concepts of fairness, familiarity and future and present 'catastrophic' potential. Intuitive perceptions include a component of outrage at involuntary exposure to hazards, in contrast to, for example, a person choosing to apply bait on their own property for possum control.

Risk communication is more likely to be effective if:

- concerns are seen to be genuinely listened to and acknowledged
- a careful and sensitive explanation is given to assist and improve the level of understanding of the risk, tailored to local concerns and acknowledging any past issues or incidents in ways that are genuine and avoid patronising people or assuming that their concerns are simply the result of insufficient or incorrect information

- the levels of concern about VTA operations (particularly aerial 1080) are recognised and efforts are made to agree on an acceptable course of action for an operation before any final decisions are made
- the response to hazards that may affect a large number of people (especially children) is made with urgency and by the relevant regulatory authority.

Risk communication needs to be a two-way process. Concerned members of the public must be well informed and guided in the actions they can take, and they must feel confident that the experts are taking account of, and acting on, their concerns.

To be effective communicators of the risks associated with VTAs in the non-occupational environment, officers need to build credibility and trust with the affected individual or communities. They need to:

- show that they are professionals committed to helping the affected people
- be open and receptive to the concerns expressed by the affected people
- establish their credentials for advising on the effects of VTAs
- be sympathetic.

In many cases, difficulties in managing environmental issues or communicating risks arise because the officer's expectations differ from those of the affected people. Thus, it is important to establish early in the process what the issues are, who is affected and what can be done about the issues and by whom, that is, the scope of the issues needs to be defined tightly.

For more, information, see *A Guide to Health Impact Assessment* (Public Health Commission 1995).

Operator communications

Officers may also need to advise operators on their communication obligations required under the approved VTA application form. The operators need to follow the consultation process as prescribed in the ERMA New Zealand's Communication Guidelines for Aerial 1080 Operations and evidence of that is sent through with the application form to the Officer. Useful guidance for operators may be found in the following resources:

- ERMA New Zealand's best practice guidelines for consultation, available at: <http://www.ermanz.govt.nz/hs/1080resources/ERMA%201080%20Guidelines.pdf>
- ERMA New Zealand's recommendations about public consultation in its 1080 reassessment decision, available at: http://www.ermanz.govt.nz/news-events/1080/Decision_2007.08.10_FINAL.pdf
- The National Possum Control Agencies (NPCA) publications to aid operators in performing their notification obligations, available at: http://www.npca.org.nz/index.php?option=com_content&view=article&id=73&Itemid=59

Management of enquiries concerning VTAs

VTA operations are often the subject of enquiries to public health units. Such enquiries can include complaints or reports of incidents or queries relating to the scope, type and attendant risks of operations.

There are a number of local, regional and national agencies that are involved in VTA operations and management, including public health units, local and regional authorities and national government agencies. When members of the public make enquiries or report concerns or complaints about VTA use, it is important that any relevant inter-agency liaison is initiated and managed as smoothly as possible.

Below are some general guidelines on how to deal with enquiries, complaints and incidents related to VTA use, focusing on the following questions:

- Is it a public health issue?
- What process should be followed in notifying the complaint/incident?
- What other agencies need to be involved?

Is it a public health issue?

The Ministry of Health (the Ministry) is responsible for ensuring that the provisions of the HSNO Act are complied with where it is necessary to protect public health. Public health is defined in section 6.1 of the New Zealand Public Health and Disability (NZPHD) Act 2000 as the health of:

- a. the people of New Zealand; or
- b. a community or section of such people.

Under the NZPHD Act, the emphasis for public health units is on public health outcomes, such as preventing human poisonings as a result of exposure to VTAs.

What process should be followed in notifying the complaint/incidents?

The Investigation and Surveillance of Poisonings and Hazardous Substances Injuries: Guidelines for Public Health Units (Ministry of Health 2009) provides a comprehensive overview of investigation processes, including details on the use of the Graded Response Protocol.

Complaints relate to reports from the public (or other agencies) of concerns about the use of VTAs, such as missing signs or bait laid close to a track. These are distinct from incidents, which relate to specific adverse effect/s resulting from VTA use, for example a poisoning resulting from exposure to a VTA. Note: A complaint can lead to identification of an incident.

Model Permit Condition 4: Complaints and Incidents, requires that operators report any complaint or incident to the contact position at the relevant public health unit within 24 hours of the incident or receipt of the complaint.

When a public health unit receives a complaint or notice of an incident involving VTAs, it must record the details of the complaint, regardless of whether any further action is taken.

If the complaint relates to a public health issue and is valid, officers should investigate the complaint to determine if any further action is warranted, for example if the operator has breached Permit Conditions. If so, the public health unit must inform ERMA New Zealand and the Ministry of the complaint.

What other agencies need to be involved?

If any other agencies are involved or have associated responsibilities, the public health unit must inform these agencies of the complaint or refer it to them as appropriate.

Once the public health unit has determined that an investigation is warranted, it must forward an incident report to ERMA New Zealand at: hsincidents@ermanız.govt.nz, and copied to the Ministry if it is of public health significance.

The Ministry and ERMA New Zealand will provide advice and information on investigation and corrective action (potentially including prosecution) as appropriate to the situation. The Ministry will include details of the incident in its annual report to ERMA New Zealand on VTA permissions.

Chapter 3: Roles and Responsibilities

Main points

- There are several enforcement agencies under the HSNO Act. A number may be involved in VTA operations.
- The public health unit has a central role in enforcement; however, the regulatory framework and guidelines require that officers report to ERMA New Zealand on routine and event-based issues concerning VTAs.
- The DoL is responsible for occupational exposure to VTAs.
- The NZFSA is responsible for VTAs in foodstuffs, including 'wild foods'.
- Applicants have key roles in providing information to officers to enable good risk assessment and the application of the right Model Permit Conditions, modified when necessary.

The role of the public health unit

In regard to health permissions for using VTAs, officers and operators carry primary responsibility for managing the potential risks of VTA operations. As long as they are adequately informed, communities, families and individuals also bear a secondary responsibility for avoiding contact with poisoned bait and ensuring that children are kept away from such bait.

The warranted HSNO enforcement officer's role includes:

- assessing applications to apply VTAs
- deciding on and setting Model Permit Conditions
- revoking a permission and/or amending any Model Permit Conditions
- monitoring operations (through notifications, etc)
- responding to complaints/incidents
- exercising enforcement powers, as delegated in the warrant of appointment as an enforcement officer under the HSNO Act
- auditing operations for compliance with Model Permit Conditions.

These roles arise largely from ERMA's delegation of the function of granting permissions for the use of VTAs to medical officers of health and health protection officers who are also warranted HSNO enforcement officers and have completed a Ministry risk management course.

Officer's power to grant permissions derives from section 95A of the HSNO Act, Control 3 of schedule 3 to the Hazardous Substances (Vertebrate Toxic Substances) Transfer Notice 2004 (As Amended), and Additional Control 4 of Appendix A of the 1080 Reassessment Decision.

Role of operators

Pest control operators who use VTAs bear direct responsibility for managing the risks of VTAs. Their role includes:

- assessing risks through planning and applications processes
- designing and carrying out operations in accordance with permit conditions and other legal requirements
- following industry best practice
- reporting any incidents involving VTAs.

Operators are subject to a number of regulatory regimes when planning and carrying out VTA operations. The most important of these include:

- Hazardous Substances and New Organisms Act 1996
- Agricultural Compounds and Veterinary Medicines Act 1997
- Resource Management Act 1991
- Health and Safety in Employment Act 1992
- Civil Aviation Act 1990.

Note: This is not a complete list of all legal obligations to which operators may be subject.

Roles of other agencies

A range of other agencies may also carry responsibility for managing the risks associated with different aspects of VTA operations. Such agencies include but are not necessarily limited to:

- the NZFSA, enforcing the Agricultural Compounds and Veterinary Medicines Act 1997
- ERMA New Zealand, overseeing enforcement of the HSNO Act by the relevant enforcement agencies
- the DoL, enforcing the Health and Safety in Employment Act 1993 (HSE Act)
- the DoC, issuing permissions to use VTAs on DoC-administered land as required under the HSNO Act
- regional councils, imposing/enforcing resource consents under the Resource Management Act 1991
- Animal Health Board, managing and implementing the National Pest Management Strategy for bovine tuberculosis in New Zealand as provided in the Biosecurity Act 1993.

Chapter 4: Risk Management

Main points

- Risk management for VTAs centres on the risk assessment, and then the appropriate and considered use of the Model Permit Conditions, with modifications where necessary to meet local conditions. The Model Permit Conditions should only be modified with consideration to these guidelines.
- Both officers and operators play a role in managing risks.
- The primary risk management role of officers is to set conditions on permissions to use VTAs. However, officers also perform other roles.
- These guidelines only cover setting conditions on permissions to use VTAs.
- The Model Permit Conditions are divided into three areas: notifications, accidental direct exposure to VTAs and contamination of water supplies.
- These guidelines provide a brief commentary on and set out the scope, rationale, commentary, modification options and an example of modifications for each Model Permit Condition.

Risk management overview

Permit conditions are *in addition to* HSNO controls. They do not replace those controls. Compliance with the Permit Conditions does not necessarily ensure compliance with HSNO requirements. Operators must ensure that they are aware of and make provision for compliance with legal requirements under HSNO and any other relevant legislation.

These guidelines are intended as practical guidance for officers in assessing which of the Model Permit Conditions to use for each VTA application and whether any need to be modified to adequately manage public health risks associated with that application.

The Model Permit Conditions, modified as required, are a tool to assist with managing the public health risk posed by VTA operations.

Priorities for managing risk should be based on the risk assessment but should also take into account public perceptions of risk. Officers should evaluate the full range of risk management tools, including their social, economic and cultural implications.

Both officers and operators play important roles in managing the risks around VTA operations.

Officers should apply risk management strategies to VTA operations in:

- procedures for deciding on permit conditions (ie, utilising effective risk assessment procedures as set out in these guidelines)
- procedures for revoking VTA permissions or amending permit conditions on a VTA permission

- reacting to emergencies or incidents that occur during operations (whether reported by operators or not)
- quality control, including (but not limited to):
 - proper and appropriate use of the VTA permission documentation
 - peer review of application decisions
 - auditing of operations with regard to both the performance of the conditions applied by the public health unit and operator compliance.

Operators should apply risk management strategies to VTA operations in:

- application procedures
- good practice procedures in applying VTAs (which, as a minimum, ensure consistency with all legal requirements, including public health permissions)
- ensuring that they meet all their legal obligations (including additional obligations beyond the conditions on the permission).

Communication between applicants and public health units

An application for permission to use a VTA may require discussion between the applicant and the local public health unit in order to clarify aspects of the application and the conditions that may be imposed, and to ensure that the conditions imposed protect properly assessed risks to public health.

Communication should be open and ongoing. It is important that both officers and applicant have full information about the risk assessment and operational processes. This is particularly important when Model Permit Conditions are modified to meet local conditions and/or vary from those used for previous operations in the same or similar areas. Open lines of communication also help to ensure that, in the event of a complaint, incident or accident, all parties are informed rapidly and that the appropriate responses can be launched as soon as possible.

Reviewing permit conditions with an applicant

Public health units should use their best efforts to ensure that applicants understand why, and on what basis, particular conditions have been modified or imposed in particular ways. This can be done through discussion or in writing between the public health unit and the applicant.

If after verbal communication with the Officer the applicant is still not happy with a permit condition, the public health unit should inform them that they can:

- request, in writing, the reasons why the HSNO officer has imposed the condition(s)
- request that the medical officer of health review the Permit Condition(s) in question
- request for an appeal under the HSNO Act
- seek a judicial review of the process by which the condition(s) were imposed.

Appeals

Part 8 of the HSNO Act provides for appeals to decisions made by ERMA, and by extension those who hold delegations from ERMA.

Section 125(1A) provides for an applicant to appeal to the District Court against a decision of ERMA under section 95A:

- i) about the terms and conditions of a permission held by the person; or
- ii) declining to grant the person a permission or revoking a permission held by the person.

Judicial review

It is important to ensure that the rationale for decisions on permit conditions are justifiable and based on robust risk assessment as they are subject to judicial review.

The reviews cover the *process* followed in making a decision using statutory powers; they do not cover the *outcome* of the process. There are three main grounds for judicial review:

- **Legality:** for example, was the decision signed off by an officer with the appropriate delegation? Is the decision within the scope of the officer's statutory powers?
- **Reasonableness:** for example, is the decision reasonable in the circumstances? Would other sensible and reasonable officers have come to the same conclusion?
- **Fairness and natural justice:** for example, did the applicant have a fair opportunity to have their say? Was the decision influenced by outside factors? Is the decision consistent with comparable situations?

Officers should note that as a judicial review deals with process, it is critical to document the decision-making process and to clearly demonstrate that it included a robust risk assessment that was tailored to the specific operation in question. A standard or 'rubber stamp' approach will not demonstrate a robust process.

If the officer signing approval on the permission is not the same officer who conducted the risk analysis and communication with the applicant, then the signing officer should be sufficiently aware of the process to be satisfied that the conditions imposed are reasonable, fair, meet the expectations agreed between the applicant and the communicating officer, and are demonstrably based on a robust risk assessment.

Use of Model Permit Conditions by VTA type and operation

The table below sets out the Model Permit Conditions that apply to each kind of VTA and application type. A ticked grey box indicates that the Model Permit Condition applies to the use of that substance.

Table 1: Applicable conditions by application method

Condition	Aerial 1080	Ground 1080	Cyanide	Phosphorous	DRC 1339
Notifications					
1 Start date	✓	✓	✓	✓	✓
2 Changes to permission	✓	✓	✓	✓	✓
3 Warning sign removal	✓	✓	✓	✓	✓
4 Complaints and incidents	✓	✓	✓	✓	✓
5 Duration of permission	✓	✓	✓	✓	✓
6 Landowner notification	✓	✓	✓	✓	✓
7 School notification	✓	✓	✓	✓	✓
8 Health services notification	✓	✓	✓	✓	✓
9 Public notification	¹	✓	✓	✓	✓
Accidental direct exposure to VTAs					
10 Exclusion from public areas	✓	✓	✓	✓	✓
11 Exclusion from walking and vehicle tracks	✓	✓	✓	✓	✓
12 Exclusion from roads	✓	✓	✓	✓	✓
13 Exclusion from dwellings	✓	✓	✓	✓	✓
14 Exclusion from schools and early childhood centres	✓	✓	✓	✓	✓
15 Aerial exclusions	✓				
16 Aerial applications to tracks and first clearances	✓				
17 Second clearances	✓				
18 GPS track logs	✓				
19 Sign contents	✓	✓	✓	✓	✓
20 Sign maintenance	✓	✓	✓	✓	✓
21 Sign vandalism	✓	✓	✓	✓	✓
Contamination of water supplies					
22 Domestic water supply: notification	✓	✓	✓	✓	✓
23 Domestic water supply: location	✓	✓	✓	✓	✓
24 Domestic water supply: exclusions		✓	✓	✓	✓
25 Domestic water supply: mitigation	✓				
26 Water supply testing	✓				
27 Public water supplies: notification	✓	✓	✓	✓	✓
28 Public water supplies: location	✓	✓	✓	✓	✓
29 Public water supplies: exclusions		✓	✓	✓	✓
30 Public water supplies: mitigation	✓				
31 Water supply mitigation: reporting	✓				
32 Water supply testing: reporting	✓				

¹ This is a legal requirement (see Additional Control 11 (under section 77A of the HSNO Act) of the reassessment decision on 1080) and is therefore not repeated in the Model Permit Conditions.

Use and modification of the Model Permit Conditions

These guidelines are primarily aimed at one area of risk management: giving officers a basic procedure for deciding on conditions to impose when issuing permissions. Each Model Permit Condition has guidelines attached to it to ensure that conditions are imposed (and/or modified) where they are necessary to manage a particular area of risk. Please note that commentaries are only included where clarification about conditions is needed.

Each of the Model Permit Conditions and guidelines for modification is presented in the following format:

CONDITION [Model Permit Condition number and title] [Text describing Model Permit Condition]	
Scope	The type of operation(s) that the condition should apply to in order to manage risks (eg, 'aerial operations only'). Table 1 also provides a summary of the types of VTA operations each Model Permit Condition should be applied to.
Rationale for the condition	The risk or risks that the condition is intended to manage.
Commentary	Additional information on how the condition should be interpreted or applied.
Modification options	Suggestions for officers on how to modify the condition in order to manage risks that the officers' risk assessments suggest are not adequately managed by the Model Permit Condition.
Example	Examples of the Model Permit Condition and modifications in practical situations.

Notifications

CONDITION 1: Start Date The applicant shall advise (<i>insert the name of the public health unit from page 1 of the application form</i>) of the commencement of the application of the VTA(s), at least 12 hours before commencing application.	
Scope	All VTA uses.
Rationale for the condition	Ensures that the officer is made aware that a potential risk to public health exists.
Commentary	The condition applies to the first application of VTAs in an operation. It names the public health unit rather than a specific individual in case that person is away at the time of notification.
Modification options	If necessary, the officer may stipulate what forms of notification are acceptable, such as 'in writing' or 'by telephone'. The officer may also choose to require notification for the commencement of pre-feeding. This ensures that the public are kept informed about the toxicity of bait. It manages the risk of a member of the public consuming a non-toxic bait and falsely believing that subsequently applied toxic bait is safe.

CONDITION 2: Changes to Permission	
The applicant shall advise (<i>insert the name of the public health unit from page 1 of the application form</i>) in writing of any material changes to the applicant's proposed operation (such as changes in operational boundaries and application types/rates).	
Scope	All VTA uses.
Rationale for the condition	Ensures that the officer is aware of changes to the operation that may affect public health impacts.
Commentary	For the purposes of this permission, 'material changes' is intended to cover any change to the operation that affects public health or the functioning of the permit conditions, such as changes in operational dates, operational areas and application types/rates. It does not include minor changes that do not affect public health or the functioning of the permit conditions, eg, correcting or adding a name of a location when the actual feature is clearly identifiable.
Modification options	The officer may wish to add examples of material changes to the condition or require that less significant changes be notified.
Example	In an area where there is considerable public opposition to an operation or heightened risks to public health, an officer may require notification of less significant changes.

CONDITION 3: Warning Sign Removal	
The applicant shall advise (<i>insert the name of the public health unit from page 1 of the application form</i>) in writing of their intention to remove warning signs from the operational area.	
Scope	All VTA uses.
Rationale for the condition	This ensures that the officer is aware when bait has ceased to be a risk to public health. It also helps the officer to monitor applicants' compliance with the sign removal requirements under Regulation 28 of the Hazardous Substances (Classes 6, 8 and 9) Regulations 2001 as varied by the Hazardous Substances (Vertebrate Toxic Agents) Transfer Notice 2004 and 1080 reassessment decision and provides the officer with the opportunity to require the signs to remain in place in case the sign removal requirements would not otherwise be complied with.
Modification options	The officer may stipulate that the notice be given in a different form in addition to or instead of in writing.
Example	In some circumstances, quick notification may be required (eg, by telephone) so that an officer can advise other users in the operational area of the VTA application.

CONDITION 4: Complaints and Incidents

Any incidents or complaints relating to the operation that are likely to impact on public health shall be reported to (*insert the name of the public health unit from page 1 of the application form*) within 24 hours of the incident or complaint.

Scope	All VTA uses.
Rationale for the condition	Mandatory reporting of any loss, misapplication or spillage of a VTA is required by Additional Control 7 of the Hazardous Substances (Vertebrate Toxic Agents) Transfer Notice 2004 and Additional Control 8 of the 1080 reassessment. This condition broadens the existing reporting requirements to include anything of a public health nature, such as the widespread and persistent removal of signs and the accidental presentation of VTAs in food containers.
Commentary	It should be noted that this does not include minor incidents, such as one-off sign vandalism or persistent vexatious complaints.
Modification options	The officer may alter the period of time in which notification must be made, or choose to require that the operator report <i>all</i> incidents and complaints to the officer so that the officer can decide whether the incidents and activities complained about are likely to impact on public health.
Example	In situations where there is uncertainty over whether to report incidents and complaints, the officer may require an operator to report <i>all</i> incidents and complaints so that the officer can assess the likely impact on public health and initiate appropriate measures.

CONDITION 5: Duration of Permission

This approval is granted for the period commencing (*insert start date*) to (*insert end date*). (*Insert the name of the public health unit from page 1 of the application form*) shall be notified if there is any alteration to the intended date of the application.

If the applicant wishes to continue the operation after this date, they should contact (*insert the name of the public health unit from page 1 of the application form*) at least two weeks before the expiry date of the original approval period.

No permission may be extended beyond 12 months from the original start date.

Scope	All VTA uses.
Rationale for the condition	This makes it easier for the permission dates to be changed in the event of poor weather or other variable circumstances. Instead of issuing a whole new permission, the officer could issue an amendment under their delegated powers under s95A (7) of the HSNO Act.
Modification options	This condition is necessary for every operation. An officer may modify the condition if circumstances change during the operation. The officer must exercise their discretion carefully when modifying the operational dates on an existing permission. Dates should not be varied to extend an operation indefinitely or to allow for a multi-year operation.
Example	Operational dates should only be varied where bad weather or other circumstances prevent an operation occurring when it was originally intended.

CONDITION 6: Landowner Notification

Before commencing the operation, the applicant shall notify occupiers and, as far as practicable, owners of land, dwellings or buildings immediately abutting the operational area.

The notice must be given sufficiently prior to, but within two months of, the proposed application of the VTA(s). If requested by the person notified, notification shall be repeated at a mutually agreed time before the proposed application.

The notice shall specify:

- i. the approximate date on which the VTA will be applied
- ii. the name and nature of the VTA
- iii. a description of the area over which the VTA will be applied
- iv. the name and address of the person responsible for applying the VTA
- v. information on safety and precautions with respect to the VTA(s) being used.

Scope	All VTA uses.
Rationale for the condition	Under Additional Control 11 of the 1080 Reassessment Decision, requirements i) to iv) exist for 1080 only. This condition ensures that landowners are notified when any VTA is used, some of which pose a higher risk to public health than 1080. The condition restates Additional Control 11 and adds the further requirement that information on safety and precautions with respect to the VTA(s) being used be provided. This ensures that land occupiers and owners are fully informed about the risks associated with the VTA.
Commentary	See the glossary for definitions of 'sufficiently prior' and 'land occupier'.
Modification options	The officer may modify this condition where it is useful from a public health perspective to notify a listed wider group of owners/occupiers than those 'immediately abutting'. This could include nearby schools if these are not already required to be notified under Condition 7. The officer may choose to also require a telephone contact number.
Example	In some cases, where nearby owners/occupiers commonly use the operational area, the condition could be widened to include owners/occupiers 'within 1 km of the operational area'.

CONDITION 7: School Notification

Before commencing the operation, the applicant shall notify schools, kōhanga reo, kindergartens and early childhood centres (*list or attach the relevant attachment of the application form*) that are known to use the operational area. The notice must be given sufficiently prior to, but within two months of, the proposed application of the VTA(s).

If requested by the institution notified, notification shall be repeated at a mutually agreed time before the proposed application. The notice shall specify:

- i. the approximate date on which the VTA will be applied
- ii. the name and nature of the VTA
- iii. a description of the area over which the VTA will be applied
- iv. the name and address of the person responsible for applying the VTA
- v. information on safety and precautions with respect to the VTA(s) being used.

Scope	Discretionary for all VTA uses.
Rationale for the condition	This ensures that all schools, kōhanga reo, kindergartens and early childhood centres that utilise the operational area are informed about the operation and receive information on safety and precautions about the relevant VTA. This enables these institutions to make informed decisions about whether to visit the area during the operational period.
Commentary	This condition is aimed at schools and other educational institutions that, although they are not located within or adjacent to the operational area, still regularly utilise the operational area in some way. This could include having regular school camps at, day trips to or stays at huts located within the area and any other similar activities. Operators should use their best efforts to identify these institutions, beginning with those listed in the application form.
Modification options	The officer may choose to require a telephone contact number or a list of particular schools known to utilise the area.
Example	Where it would be difficult for an operator to identify all institutions that utilise the area, the operator should list all known ones for the officer.

CONDITION 8: Health Services Notification

The applicant shall notify the nearest/local health services of the proposed application of the VTA(s). Nearest/local health services include GPs and other primary health services, ambulance services and hospitals.

The notice must be given sufficiently prior to, but within two months of, the proposed application of the VTA(s). The notice shall specify:

- i. the approximate date on which the VTA will be applied
- ii. the name and nature of the VTA
- iii. a description of the area over which the VTA will be applied
- iv. the name and address of the person responsible for applying the VTA
- v. information on safety and precautions with respect to the VTA(s) being used.

Scope	For aerial application of 1080; discretionary for all other VTA uses.
Rationale for the condition	This ensures that relevant local health service providers are aware of potential risks to public health and are prepared for dealing with any injuries or illness caused by exposure to VTAs.
Modification options	<p>It is recommended that the condition be stated in full for all aerial applications of 1080 as no health services notification requirements currently exist for this VTA.</p> <p>The question of whether the condition is stated for all other VTA uses should be at the discretion of the officer, based on an objective risk assessment.</p> <p>The officer may choose to list the actual health services and/or to include other related service providers, such as vets and the police, if they believe that this will decrease the potential risk to public health from a particular operation.</p> <p>The police should be included where there is a risk of theft of bait or deliberate contamination incidents where public health may be put at risk.</p>
Example	The police may also be notified if there is a possibility of protest incidents and other activities occurring as a result of the VTA use, which may have an impact on public health (eg, widespread sign vandalism or a risk of unlawful removal of bait).

CONDITION 9: Public Notification

The applicant shall give public notice in the following media (eg, newspapers, community newsletters) of the proposed application of the VTA(s): *(List)*.

The notice must be given sufficiently prior to, but within two months of, the proposed application of the VTA(s). The notice shall specify:

- i. the approximate date the VTA(s) will be applied
- ii. the name and nature of the VTA(s)
- iii. a description of the area over which the VTA(s) will be applied
- iv. the location(s) where the public may view maps of the area over which the VTA(s) will be applied and the times when such maps can be viewed
- v. the name and address of the person responsible for applying the VTA(s).

The applicant must provide a copy of the public notice, and the date(s) and media in which it was published to *(insert the name of the public health unit from page 1 of the application form)* before commencing the operation.

Scope	Not required for aerial application of 1080 (see rationale below); discretionary for all other VTA uses.
Rationale for the condition	The requirement to publicly notify according to this condition already exists for the aerial application of 1080 products, under Additional Control 6 of the 1080 Reassessment Decision. This condition gives officers the option of extending the requirement for other VTA uses.
Modification options	The question of whether the condition is stated for all other VTA uses should be at the discretion of the officer, based on an objective risk assessment.
Example	This condition would generally be required for a sodium cyanide operation in which paste is ground laid in an open area near a popular tourist spot but is unlikely to be required for a phosphorous operation on private land.

Accidental direct exposure to VTAs

<p>CONDITION 10: Exclusion from Public Areas</p> <p>No Vertebrate Toxic Agent (VTA) shall be (<i>specify 'aerially' or 'ground'</i>) applied within the distances listed below, and not where it is within sight of, the following huts, access points, camping and public areas:</p> <p>(<i>List (specify exclusion distance for each listed public area).</i>)</p> <p>Warning signs shall be placed at each of the listed hut(s), access points, camping and public amenity area(s) prior to the laying of before the Vertebrate Toxic Agent VTA(s) is/are laid in adjoining areas.</p>	
Scope	All VTA uses.
Rationale for the condition	<p>This ensures that VTAs are applied a minimum distance away from public areas such as tramping huts, bivvies/shelters, tent camping sites, picnic areas, anglers' access points, and watercraft landing points in order to reduce the risk of direct human contact with baits.</p> <p>Any baits applied beyond this minimum distance are not permitted to be within sight of the public to minimise the risk of human contact.</p> <p>Each of these places is considered to be an entry point to the operational area for signage purposes, to ensure that members of the public are informed of the presence of VTA baits.</p> <p>The exclusion distance will generally be lower for ground applications as the VTAs can be placed with more accuracy, particularly controlling for visibility of baits. Some operators will do aerial applications of the general area and ground-based applications closer to listed sites/amenities.</p>
Modification options	<p>The officer needs to specify:</p> <ul style="list-style-type: none"> • whether the condition applies to aerial or ground applications • the locations that should be excluded • the exclusion distance for each location. <p>The base exclusion distance for ground operations should be 20 m. The base exclusion distance for aerial operations should be 80 m.</p> <p>The base exclusion distances may be varied to adequately manage public health risks, depending on the terrain and vegetation, accessibility and visibility of bait, method of application, and public use patterns. Sites with generally high usage or high usage during the planned operation time (eg, a long weekend) may require an increased exclusion distance. Conversely, an 80 m aerial exclusion may be excessive in rough terrain with low usage and heavy vegetation.</p> <p>As different locations may require different exclusion distances, the officer should specify the appropriate exclusion distance for each location listed on the condition.</p> <p>The officer should refer to the current approved application form when creating the list of locations.</p> <p>The officer should use generic wording rather than listing locations where it is not feasible or possible to obtain a complete list. The officer may list the known locations then add 'and any other tramping huts, bivvies/shelters, tent camping sites, picnic areas, angler access points and watercraft landing points in the area'.</p> <p>Where both aerial and ground-based applications are proposed, the officer will need to repeat the condition for each type of application.</p>

Example	<p>An application proposes ground-based application of cyanide paste in the vicinity of a popular tramping hut frequently used by families and school groups (Hut 1). Hut 1 stands in a large grassy clearing, including a small number of trees within 20 m of the hut. Thick bush cover begins 30 m from the hut.</p> <p>The officer adjusts the exclusion distance to 80 m to ensure that all bait is placed away from the hut and in vegetation cover that will help limit the accessibility and visibility of the bait. Hut 2 is within the same operational area but is extremely isolated, located in steep country and thick bush and is seldom used. The officer therefore adjusts the exclusion distance to 20 m for Hut 2.</p> <p>In the condition, the locations and distances are listed as follows:</p> <ul style="list-style-type: none">• Hut 1: 80 m• Hut 2: 20 m.
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CONDITION 11: Exclusion from Walking and Vehicle Tracks	
No VTA shall be (<i>specify 'aerially' or 'ground'</i>) applied within the distances listed below and not where it is within sight of the following walking and vehicle tracks: (<i>List</i>) (<i>specify distance from each listed track</i>).	
Scope	All VTA uses.
Rationale for the condition	<p>This ensures that VTAs are applied a minimum distance away from walking and vehicle tracks in order to reduce the risk of direct human contact with bait. Any bait applied beyond this minimum distance is not permitted to be within sight of the public to minimise the risk of human contact.</p> <p>Each of these places is considered to be an entry point to the operational area for signage purposes, to ensure that members of the public are informed of the presence of VTA baits.</p> <p>The exclusion distance will generally be lower for ground applications as the VTAs can be placed with more accuracy, particularly controlling for visibility of bait.</p>
Modification options	<p>The officer needs to specify:</p> <ul style="list-style-type: none"> • whether the condition applies to aerial or ground applications • the locations that should be excluded • the exclusion distance for each location. <p>The base exclusion distance for ground operations should be 20 m. The base exclusion distance for aerial operations should be 80 m.</p> <p>The base exclusion distances may be varied to adequately manage public health risks, depending on the terrain and vegetation, accessibility and visibility of bait, method of application, and public use patterns. Sites with generally high usage or high usage during the planned operation time (eg, a long weekend) may require an increased exclusion distance. Conversely an 80 m aerial exclusion may be excessive in rough terrain with low usage and heavy vegetation.</p> <p>As different locations may require different exclusion distances, the officer should specify the appropriate exclusion distance for each location listed on the condition.</p> <p>Refer to the current approved application form when creating the list of locations.</p> <p>The officer should use generic wording rather than attempting to list locations where it is difficult or impossible to obtain a complete list. The officer may list the known locations then add 'and any other walking and vehicle tracks in the area'.</p> <p>Where both aerial and ground-based applications are proposed, the officer will need to repeat the condition for each type of application.</p>
Example	<p>An application for aerial VTA use on forestry land includes a mapped vehicle track that is now closed. The entry to the block is by locked gate, and the mapped track has deteriorated at several points as a result of storms, including near the gate, so it is now impassable by vehicle. There is heavy brush/blackberry coverage in the area. The area is not known to be used for recreational purposes.</p> <p>The officer may choose to decrease or remove the aerial exclusion distance for the vehicle track as the risk to public health is limited.</p>

CONDITION 12: Exclusion from Roads	
No VTA shall be (<i>specify 'aerially' or 'ground'</i>) applied within the distances listed below and not where it is within sight of the following roads and lay-bys: (<i>List</i>) (<i>specify distance from each listed road/lay-by</i>).	
Scope	All VTA uses.
Rationale for the condition	<p>This ensures that VTAs are applied a minimum distance away from roads and lay-bys in order to reduce the risk of direct human contact with bait.</p> <p>Any bait applied beyond this minimum distance must not be visible from the listed roads and lay-bys, to minimise the risk of human contact. Each of these places is considered to be an entry point to the operational area for signage purposes, to ensure that members of the public are informed of the presence of VTA bait.</p> <p>The exclusion distance will generally be lower for ground applications as the VTAs can be placed with more accuracy, particularly controlling for visibility of bait.</p>
Modification options	<p>The officer needs to specify:</p> <ul style="list-style-type: none"> • whether the condition applies to aerial or ground applications • the locations that should be excluded • the exclusion distance for each location. <p>The base exclusion distance for ground operations should be 20 m. The base exclusion distance for aerial operations should be 80 m.</p> <p>The base exclusion distances may be varied to adequately manage public health risks, depending on the terrain and vegetation, accessibility and visibility of baits, method of application, and public use patterns. Sites with generally high usage or high usage during the planned operation time (eg, a long weekend) may require an increased exclusion distance. An 80 m aerial exclusion may be excessive in rough terrain with low usage and heavy vegetation.</p> <p>As different locations may require different exclusion distances, the officer should specify the appropriate exclusion distance for each location listed on the condition.</p> <p>Refer to the current approved application form when creating the list of locations.</p> <p>The officer should use generic wording rather than attempting to list locations where it is difficult or impossible to obtain a complete list. The officer may list the known locations then add 'and any other walking and vehicle tracks in the area'.</p> <p>Where both aerial and ground-based applications are proposed, the officer will need to repeat the condition for each type of application.</p>
Example	<p>An operational area abuts a section of a state highway that includes a lay-by lookout. A combined aerial/ground operation is planned for the area downhill from the lay-by, which sits above a 2 m bluff. The ground below the lay-by is covered with thick bush. The remainder of the area abutting the road is covered with thick bush to the road verge and rises steeply from the road.</p> <p>The officer chooses to allow a minimum distance for ground applications of less than 20 m, given the terrain and vegetation cover. Therefore the officer creates a condition that excludes ground-applied VTAs from within 10 m of the lay-by. As the proposed operation also includes an aerial 1080 application, the officer creates an additional condition that requires that 1080 not be aerially applied within 80 m of the listed lay-by.</p>

CONDITION 13: Exclusion from Dwellings	
No VTA shall be applied within 150 m of (or within a different distance if mutually agreed in writing with the occupiers), and not be visible from, dwellings or 'built-up areas' (<i>list or attach relevant attachment of the application form</i>).	
Scope	All VTA uses.
Rationale for the condition	This ensures that VTAs are not accessible near where people live and congregate.
Commentary	The term 'built-up areas' includes areas where people may be present on the fringes of urban areas and towns, such as industrial areas.
Modification options	In some cases, it may be possible for the officer to list the dwellings and built-up areas specifically. This would provide greater clarity to operators as to locations that must be excluded. Officers should note that an explicit list should only be used where there is little or no danger of risks associated with inadvertently leaving a location off the list.
Example	An application covers a remote back-country area with four dwellings. All dwellings are in isolated locations surrounded by bush. The officer modifies the condition to list each dwelling by road address or GPS reference to ensure that the 150 m exclusion distance is maintained specifically for each dwelling.

CONDITION 14: Exclusion from Schools and Early Childhood Centres	
No VTA shall be applied within 150 m of (or a greater distance if mutually agreed in writing with the occupiers), and not where it is visible from, the following schools, kindergartens, kōhanga reo and early childhood centres: (<i>List</i>)	
Scope	All VTA uses.
Rationale for the condition	There is a greater risk to public health when VTAs are applied in areas accessible to children who may be more likely to pick up and eat or play with poisoned bait than adults. A fixed exclusion zone around schools, kindergartens, kōhanga reo and early childhood centres adjoining the operational area therefore minimises this risk.
Modification options	Refer to the current approved application form in creating the list of schools, kindergartens, kōhanga reo and early childhood centres close to the operational area. The officer may also choose to increase the fixed exclusion distance, regardless of any written agreements, if the officer believes that the risks warrant a larger exclusion area.
Example	Exclusion zones may need to be larger around schools where children are known to access operational areas adjoining the school property.

CONDITION 15: Aerial Exclusions	
An aircraft that is carrying out an aerial application must not, when flying to or from the area where the VTA is applied, fly over the following 'no fly' areas: (<i>List</i>)	
Scope	Discretionary for aerial application of 1080.
Rationale for the condition	This ensures that aircraft do not fly over any areas where accidental dropping or spillage of bait may present a substantial public health risk. This condition expands on Additional Control 7 of the 1080 Reassessment Decision, which prohibits aircraft flying over public drinking water supplies or within 100 m upstream of a drinking water intake.
Commentary	This condition does not cover aircraft flying to a loading site at the start of the operation where aircraft will not be carrying bait. It covers aircraft flying back to base following the operation as the aircraft's hopper will not yet have been decontaminated.
Modification options	The officer should list areas over which aircraft must not fly if it is believed that accidental dropping or spillage of bait in transit may present a public health risk. It is accepted that, since aircraft will always have to fly over some areas used by the public in order to reach operational areas, it is impractical for the list to include <i>all</i> areas where dropped bait may present a public health risk (eg, seldom-used and isolated areas, which include bush tracks). The list should therefore only include the areas most at risk, for example residential areas. The most important protection against this risk is responsible flying and immediate notification and mitigation of any accidental spillage.
Example	If an operation occurs near an urban area, that area should be included on the list if it is reasonable for aircraft to fly around it rather than over it.

CONDITION 16: Aerial Applications to Tracks and First Clearances	
The applicant may aerially apply 1080 to the following walking and vehicle tracks but not during or within 24 hours of the start of school holidays, public holidays or public holiday weekends: (<i>List</i>) If the applicant aerially applies 1080 to any of the above listed tracks, they shall inspect those tracks as soon as possible and not more than 24 hours after the VTA application and make reasonable efforts to find and remove all bait and, if encountered, animal carcasses.	
Scope	For aerial application of 1080.
Rationale for the condition	This ensures that, where aerial application to tracks is permitted, it should take place in sufficient time to allow the clearance of these tracks and roads before school or public holidays commence so as to minimise the risk of direct human (particularly children) contact with baits.
Commentary	Note that this list of tracks is different to the list in Condition 11 and should be developed in consultation with DoC and/or the relevant track manager.
Modification options	The officer has the discretion to permit the aerial application of 1080 to some tracks and roads, instead of excluding them under Condition 11, provided that bait is cleared from these tracks and roads as soon as possible. This would generally apply to low- or medium-use tracks.
Example	In back-country operations, where tracks are seldom used in winter but may still be used on weekends or by hunters, such tracks should be listed for clearance.

CONDITION 17: Second Clearances	
<p>The applicant shall undertake a second inspection of the following walking and vehicle tracks and make reasonable efforts to find and remove all bait and, if encountered, animal carcasses: (<i>List</i>)</p> <p>The second inspection shall be made at least 24 hours after the VTA application. It should be timed to take place either:</p> <ul style="list-style-type: none"> i. immediately after the occurrence of strong winds; or ii. immediately before the weekend or commencement of school holidays or public holidays; <p>whichever occurs first.</p>	
Scope	Discretionary for aerial application of 1080.
Rationale for the condition	This ensures that where 1080 is aerially applied to tracks, those tracks that receive a moderate to high level of use, or are regularly used by children, are re-cleared at least once following the initial clearance. For example, some bait can be caught in trees and may fall to the ground after high winds, creating a degree of public health risk.
Commentary	When a second clearance is undertaken, it should be timed so that it takes place after the occurrence of strong winds that may dislodge bait caught up in the forest canopy or, failing that, immediately before the weekend or public holidays.
Modification options	<p>The officer may use their own discretion in applying this condition. The condition should be considered where the applicant is permitted to aerially apply to medium-use tracks.</p> <p>The condition may not be required for low-use tracks, but the officer should consider such tracks on a case-by-case basis, including consultation with DoC and/or the relevant track manager(s) if required.</p>
Example	Tracks that have a moderate degree of use, especially in weekends, should be listed for a second clearance to ensure that any bait and/or carcasses are cleared.

CONDITION 18: GPS Track Logs	
<p>A GPS track log shall be recorded and maintained for each track clearance and made available to (<i>insert the name of the public health unit from page 1 of the application form</i>) within 2 weeks.</p>	
Scope	For aerial application of 1080.
Rationale for the condition	This provides a record of tracks have been cleared and when.
Modification options	The officer may apply this condition in all instances where the applicant is permitted to aerially apply 1080 to tracks and roads.
Example	An officer may require this condition on an operation that includes track and roads that receive moderate use, to ensure that the operator keeps a formal record of the work that has been undertaken. It may be useful in the event of a complaint from the public relating to bait found on roads or tracks.

CONDITION 19: Sign Contents	
All warning signs must include an international symbol for toxic substances (eg, skull and crossbones) and a statement advising that children and pets should not be allowed to wander (eg, 'WATCH CHILDREN at all times').	
Scope	All VTA uses.
Rationale for the condition	This ensures that all signs erected carry the skull and crossbones – an internationally recognised symbol of danger – so that older children and non-English speakers can understand that toxic substances are present. The symbol must be large enough to be readily visible and not be obscured by other wording or features of the warning sign.
Commentary	This condition would be applied in addition to any other regulatory requirements for warning signs.
Modification options	The officer may require specific wording to be included on the sign to respond to particular risks in certain circumstances.

CONDITION 20: Sign Maintenance	
During the period in which the bait remains toxic, warning signs at the locations listed below shall be inspected immediately before the commencement of school holidays, public holidays or public holiday weekends: (<i>List</i>) Any signs that are damaged, vandalised or otherwise become illegible shall be replaced within 24 hours of discovery of the damage.	
Scope	Discretionary for all VTA uses.
Rationale for the condition	Officers can specify a maintenance regime that ensures signs are maintained during key public health risk periods, ensuring that the public are informed about the presence of and risks posed by VTA bait. Signs also provide information on methods people can use to minimise risks, eg, to stay on tracks, ensure children do not touch bait, etc. The condition is designed to provide clarity on the Hazardous Substances (Identification) Regulations 2001, which require that signs meet visibility requirements throughout their lifetime but don't stipulate how this might be assured.
Modification options	The decision to require the condition to be stated should be at the discretion of the officer, based on an objective risk assessment. This condition should be used where the officer is not assured that the applicant has an adequate sign management plan. For certain operations, eg, DRC on open farmland in an isolated area, this condition is unlikely to be relevant and may be omitted.
Example	This condition can be used in conjunction with Condition 21, where the operation covers areas that are variously affected by sign vandalism. In some circumstances, Condition 21 may replace this condition where the degree and frequency of sign vandalism warrants a specified frequency (ie, weekly) inspection and replacement.

<p>CONDITION 21: Sign Vandalism</p> <p>During the period in which the bait remains toxic, warning signs shall be inspected weekly in the following locations: (<i>List</i>)</p> <p>Any signs that are damaged, vandalised or otherwise become illegible shall be replaced within 24 hours of discovery.</p>	
Scope	Discretionary for all VTA uses.
Rationale for the condition	This ensures that signs in areas where vandalism is known to be common are maintained properly, ensuring that the public are well informed about the presence of VTA bait.
Modification options	<p>The decision to require this condition to be used as a supplement to Condition 20 should be at the discretion of the officer, generally based on any localised sign vandalism that is anticipated or that has been identified by the applicant and/or where the officer is not assured that the applicant has an adequate sign management plan.</p> <p>Vandalism of previous signs or vandalism and/or graffiti in the area are clear indicators of likely need for this condition.</p>
Example	The officer requires weekly signs inspection in an area that attracts young families in the weekends but that is also known to be subject to frequent vandalism.

Contamination of water supplies

<p>CONDITION 22: Domestic Water Supply: Notification</p> <p>The applicant shall notify the intended operation to all people who source their domestic water supply from the water extraction point:</p> <ul style="list-style-type: none"> • from within the operational area; or • within (<i>specify distance</i>) of the operational area where the water source is a surface waterway that flows through or rises within the operational area. <p>The notice must be given sufficiently prior to, but within two months of, the proposed application of the VTA(s).</p> <p>If requested by the person notified, notification shall be repeated at a mutually-agreed time before the proposed application.</p>	
Scope	All VTA uses.
Rationale for the condition	This ensures that all people who draw water from within or near operational areas have full knowledge of the operation. The stipulated timing is consistent with the requirements of Additional Control 11 in ERMA New Zealand's 1080 Reassessment Decision.
Commentary	<p>The condition makes it clear that the only people living outside the operational area who need to be notified are those who source their domestic water supply within 3 km of the boundary of the operational area <u>and</u> where the water source is one that may contain bait (ie, only water sources that actually pass through or rise within the operational area).</p> <p>People whose domestic water supplies are sourced within 3 km of the operational area but who source water from waterways that are completely separate from the operational area (eg, from a different catchment), do not need to be notified.</p>
Modification options	<p>In setting the distance, 200 m is considered sufficient for all ground applications of VTAs as the application methods and nature of the bait means the bait is unlikely to enter waterways. The distance is set at 3 km for aerial applications of 1080.</p> <p>If the officer believes the recommended distances do not appropriately address the potential risks in a particular situation, the officer may need to consult a third party (eg, local hydrologist, council officer, research provider) to determine the appropriate distance. However, the set distance of 3 km for aerial applications of 1080 should not be reduced.</p> <p>The officer may choose to require notification of pre-feeds. Although pre-feeds are not toxic and are not covered by the HSNO regime, officers may choose to apply the exclusion distance to pre-feeds to reduce the potential for confusion over the toxicity of baits.</p>
Example	The officer, in consultation with a local hydrologist, extends the exclusion distance to 500 m for a ground 1080 operation in a karst landscape, which has complex local hydrology.

<p>CONDITION 23: Domestic Water Supply: Location</p> <p>The applicant shall verify the location of water supply intakes with all people who source their domestic water supply from the water extraction point:</p> <ul style="list-style-type: none"> • from within the operational area; or • within (<i>specify distance</i>) of the operational area, where the water source is a surface waterway that flows through or rises within the operational area. <p>A GPS waypoint file of water supply intakes shall be recorded and made available to (<i>insert the name of the public health unit from page 1 of the application form</i>) on request.</p>	
Scope	For aerial application of 1080; discretionary for all other VTA uses.
Rationale for the condition	<p>This ensures that operators locate all water intakes within and near the operational area, in turn ensuring (in the case of aerial operations) that they can apply proper mitigation measures to all at-risk intakes.</p> <p>This condition strengthens the expectation of accurate identification of domestic water supply intakes, as the 1080 Reassessment Decision noted that ‘prevention of exposure relies more on the accurate identification’ of domestic water supplies.</p>
Commentary	<p>The condition makes it clear that the only water intakes from outside the operational area that need to be verified are those that source their domestic water supply within 3 km of the boundary of the operational area <u>and</u> where the water source is one that may contain bait (ie, only water sources that actually pass through or rise within the operational area).</p> <p>The locations of domestic water supply intakes that are sourced within 3 km of the operational area but that source water from waterways that are completely separate from the operational area (eg, from a different catchment), do not need to be verified.</p>
Modification options	<p>In setting the distance, 200 m is considered sufficient for all ground applications of VTAs as the application methods and nature of the bait means that bait is unlikely to enter waterways. The distance is set at 3 km for aerial applications of 1080.</p> <p>For non-aerial 1080 VTA uses, the condition should be discretionary, based on the probable risk from accidental treatment close to water supply intakes. For such operations, the officer may decide not to require a list of water supply intakes to be maintained where water contamination is unlikely.</p> <p>For uses of DRC or cyanide, where water contamination is unlikely, this condition may be omitted.</p>
Example	The officer, in consultation with a local hydrologist, requires verification and extends the verification distance to 500 m, for a ground 1080 operation in a karst landscape, which has complex local hydrology.

CONDITION 24: Domestic Water Supply: Exclusions	
No VTA shall be ground-laid within 20 m of domestic water supply intakes that are within the operational area. For flowing surface watercourses, the 20 m exclusion shall extend for a length of 50 m upstream from the point of intake.	
Scope	For all ground applications of VTAs.
Rationale for the condition	This ensures that ground-laid VTAs cannot enter water supplies used for human consumption. It also reduces the risk of contamination from poisoned carcasses.
Commentary	Flowing surface watercourses include rivers, streams and creeks. To avoid doubt, where an entire, large still-water body, such as a lake or reservoir, is considered to be the water intake, the 20 m exclusion would apply around the entire water body; the 20 m exclusion extending 50 m up each feeder stream into the water body would not be required. If the still-water body is of small volume, the 20 m exclusion extending 50 m up each feeder stream may be required.
Modification options	Where there is an increased risk of the VTA or poisoned carcasses entering into waterways (eg, sloping ground toward the waterway; heavy vegetation overhanging the waterway), the exclusion distances may be increased. This will depend on local conditions, including rainfall, the gradient of the terrain, vegetation and soil type. The officer may consult a third party (eg, local hydrologist, council officer, research provider) to ascertain the relative risk of bait entering local waterways in order to appropriately modify the exclusion distance.
Example	In steeper areas, the exclusion distance could be increased to minimise the risk from VTAs or poisoned carcasses. In flat areas with low possum numbers, the exclusion distance could be decreased if this does not increase potential public health risks.

CONDITION 25: Domestic Water Supply: Mitigation	
For an aerial application of 1080, applicants must provide mitigation to all households and huts/ camping areas that source their domestic water supply from the water extraction point:	
<ul style="list-style-type: none"> • from inside the operational area; or • within 3 km of the operational area where the water source is a surface waterway that flows through or rises within the operational area if mitigation is requested by household occupiers or managers of huts/camping grounds. 	
Mitigation shall involve either or both of the following:	
<ul style="list-style-type: none"> i. No 1080 shall be applied within 50 m of the water supply intakes. For flowing surface waterways, the 50 m exclusion shall extend for a length of 200 m upstream from the point of intake. ii. The domestic water supply shall be temporarily disconnected until such time as water testing finds no VTA contamination above 50 percent of the Ministry's PMAV.* If no temporary water source is available, an adequate alternative potable water supply (to be used for drinking and cooking) will be provided to the affected household; the amount per day to be agreed with the household, until testing is completed. 	
Scope	For aerial application of 1080.
Rationale for the condition	This ensures that operators take steps to mitigate the risk of 1080 bait entering domestic water supplies through consultation with the household occupiers and managers of huts/camping areas.
Commentary	<p>In setting the distance for which water supplies the mitigation must apply to, 200 m is considered sufficient for all ground applications of VTAs as the application methods and nature of the bait means that the bait is unlikely to enter waterways.</p> <p>The distance is set at 3 km for aerial applications of 1080.</p> <p>Flowing surface watercourses include rivers, streams and creeks. Where an entire, large still-water body, such as a lake, pond or reservoir, is considered to be the water intake, the 50 m exclusion would apply around the entire water body. The 50 m exclusion extending for 200 m up each feeder stream into the water body would not be required.</p> <p>If the water body is of small volume, the 50 m exclusion extending for 200 m up each feeder stream may be required.</p>
Modification options	The exclusion zone around the intake may need to be changed to account for different contour types or particular operations.
Example	In steep areas, the exclusion area may need to be increased to protect against bait falling into the waterway. For other operations (eg, along farm streams), the officer may allow bait closer to the water edge as long as the bait can be applied in such a way as to ensure that none falls into the water (eg, using trickle feeding).

* The Provisional Maximum Accepted Value (PMAV) represents the concentration of sodium fluoroacetate (1080) in water that, on the basis of present knowledge, is not considered to cause any significant risk to the health of the consumer over their lifetime of consumption of that water. Fifty percent of the PMAV is a 1080 concentration of two parts per billion.

CONDITION 26: Water Supply Testing

The water testing shall conform to the requirements attached to this permission.

Where water testing reveals VTA contamination over 50 percent of the PMAV,* the alternative potable water supply shall be maintained until such time as a repeat test confirms VTA contamination below 50 percent of the PMAV, in accordance with the requirements of the Drinking-water Standards of New Zealand.

Scope	For aerial application of 1080.
Rationale for the condition	<p>This ensures that, where testing is requested, it conforms to robust procedures (see the box below for modification option). A robust testing regime ensures that potentially contaminated water supplies are only re-opened when there is proof that there is no possibility of contamination.</p> <p>The conditions must conform to the current Landcare Research Protocol for Environmental Water Sampling and Testing Associated with 1080 Pest Control Operations.</p>
Modification options	There are no modification options for this condition.

* The Provisional Maximum Accepted Value (PMAV) represents the concentration of sodium fluoroacetate (1080) in water that, on the basis of present knowledge, is not considered to cause any significant risk to the health of the consumer over their lifetime of consumption of that water. Fifty percent of the PMAV is a 1080 concentration of two parts per billion.

<p>CONDITION 27: Public Water Supplies: Notification</p> <p>The applicant shall notify the details of the intended operation to all managers of public water supplies who source their public water supply from a water extraction point:</p> <ul style="list-style-type: none"> • from within the operational area; or • within (<i>specify distance</i>) of the operational area where the water source is a surface waterway that flows through or rises within the operational area. <p>The notice must be given sufficiently prior to, but within two months of, the proposed application of the VTA(s).</p> <p>If requested by the person notified, notification shall be repeated at a mutually-agreed time before the proposed application.</p>	
Scope	All VTA uses.
Rationale for the condition	This ensures that managers of public water supplies have sufficient notice of planned operations so that they have full knowledge of the operation and should be well prepared to address the potential risks. The stipulated timing is consistent with the requirements of Additional Control 11 in ERMA's 1080 Reassessment Decision.
Commentary	<p>The condition makes it clear that the only managers of water supplies located outside the operational area who need to be notified are those who source their public water supply within 3 km of the boundary of the operational area <u>and</u> where the water source is one that may contain bait (ie, only water sources that actually pass through or rise within the operational area).</p> <p>Managers whose public water supplies are sourced within 3 km of the operational area but who source water from waterways that are completely separate from the operational area (eg, from a different catchment) do not need to be notified.</p>
Modification options	<p>In setting the distance, 200 m is considered sufficient for all ground applications of VTAs as the application methods and nature of the bait means that bait is unlikely to enter waterways. The distance is set at 3 km for aerial applications of 1080.</p> <p>If the officer believes the recommended distances do not appropriately address the potential risks in a particular situation, the officer may need to consult a third party (eg, local hydrologist, council officer, research provider) to determine the appropriate distance.</p> <p>The officer may also choose to require notification of pre-feeds. Although pre-feeds are not toxic and are not covered by the HSNO regime, officers may choose to apply the exclusion distance to pre-feeds to reduce the potential for confusion over the toxicity of bait.</p>
Example	Where a major public water supply sources its water 3 km from the operational area, the notification distance may need to be extended to include that water supply.

CONDITION 28: Public Water Supplies: Location

The applicant shall mutually verify the location of public water supply intakes with all water supply managers who source their public water supply from a water extraction point:

- from within the operational area; or
- within (*specify distance*) of the operational area where the water source is a surface waterway that flows through or rises within the operational area.

A GPS waypoint file of water supply intakes shall be recorded and made available to (*insert the name of the public health unit from page 1 of the application form*) on request.

Scope	For aerial application of 1080; discretionary for all other VTA uses.
Rationale for the condition	<p>This ensures that operators locate all water intakes within and near the operational area, in turn ensuring (in the case of aerial operations) that they can apply proper mitigation measures under Condition 30 to all at-risk intakes.</p> <p>This condition strengthens the expectation of accurate identification of domestic water supply intakes as the 1080 Reassessment Decision noted that 'prevention of exposure relies more on the accurate identification' of domestic water supplies.</p>
Commentary	<p>The condition makes it clear that the only public water intakes from outside the operational area that need to be verified are those that source their water supply within 3 km of the boundary of the operational area <u>and</u> where the water source is one that may contain bait (ie, only water sources that actually pass through or rise within the operational area).</p> <p>The locations of public water supply intakes that are sourced within 3 km of the operational area but that source water from waterways that are completely separate from the operational area (eg, from a different catchment) do not need to be verified.</p>
Modification options	<p>In setting the distance, 200 m is considered sufficient for all ground applications of VTAs as the application methods and nature of the bait means that the bait is unlikely to enter waterways. The distance is set at 3 km for aerial applications of 1080.</p> <p>For non-aerial 1080 VTA uses, the condition should be discretionary, based on the probable risk from accidental treatment close to water supply intakes.</p> <p>For such operations, the officer may decide not to require a list of water supply intakes to be maintained where water contamination is unlikely.</p> <p>For uses of DRC or cyanide, where water contamination is unlikely, this condition may be omitted. The officer may decide to require a list of public water supplies as a precondition for commencing the application of the VTA.</p>
Example	For operations close to urban areas with multiple public water supplies, the officer may require a list of public water supplies to ensure that operators properly identify all such supplies.

CONDITION 29: Public Water Supplies: Exclusions	
No VTA shall be ground laid within 50 m of public water supply intakes that source water within the operational area. For flowing surface watercourses, the 50 m exclusion shall be extended to 100 m upstream of the point of intake (<i>list or attach relevant attachment of the application form</i>).	
Scope	For all ground applications of VTAs.
Rationale for the condition	This ensures that ground-laid VTAs cannot enter water supplies used for human consumption, and the risk of contamination from poisoned carcasses is also reduced.
Commentary	Flowing surface watercourses include rivers, streams and creeks. To avoid doubt, where a water intake is a large still-water body, such as a lake or reservoir, the 50 m exclusion would apply around the entire water body; the 100 m exclusion up each feeder stream into the water body would not be required. Where an entire still-water body, such as a lake or reservoir, is considered to be the water intake, and it is of a small volume, the 100 m exclusion up each feeder stream into the water body may be required.
Modification options	Where there is an increased risk of the VTA or poisoned carcasses entering into waterways, the exclusion distances may be increased. This will depend on local conditions including rainfall, the gradient of the terrain, vegetation and soil type. The officer may consult a third party (eg, local hydrologist, council officer, research provider) to ascertain the relative risk of bait entering local waterways in order to modify the exclusion distance.
Example	In steeper areas, the exclusion distance could be increased to minimise the risk from VTAs or poisoned carcasses. On flat terrain with proven low possum numbers, the exclusion distance could be decreased.

CONDITION 30: Public Water Supplies: Mitigation

For an aerial application of 1080, applicants must provide mitigation to all public water supplies that source their public water supply from a water extraction point:

- from within the operational area; or
- within (*specify distance*) of the operational area where the water source is a surface waterway that flows through or rises within the operational area.

Mitigation shall be mutually agreed in writing between the applicant and water supply managers and involve either or both of the following:

- No 1080 shall be applied within 200 m of the water supply intakes. For flowing surface watercourses, the 200 m exclusion shall be extended to 400 m upstream of the point of intake.
- If an interim water supply is available, the affected water supply shall be temporarily disconnected until such time as water testing finds no VTA contamination above 50 percent of the Ministry's PMAV*, in accordance with the requirements of the Drinking-water Standards of New Zealand.

Scope	For aerial application of 1080.
Rationale for the condition	This ensures that operators take steps to mitigate the risk of 1080 bait entering public water supplies following consultation with the water supply manager.
Commentary	<p>In setting the distance for which water supplies the mitigation must apply to, 200 m is considered sufficient for all ground applications of VTAs as the application methods and nature of the bait means bait is unlikely to enter waterways. The distance is set at 3 km for aerial applications of 1080.</p> <p>Flowing surface watercourses include rivers, streams and creeks.</p> <p>To avoid doubt, where a water intake is a large still-water body, such as a lake or reservoir, the 200 m exclusion would apply around the entire water body; the 400 m exclusion up each feeder stream into the water body would not be required.</p> <p>Where an entire still-water body, such as a lake or reservoir, is considered to be the water intake, and it is of a small volume, the 400 m exclusion up each feeder stream into the water body may be required.</p>
Modification options	The exclusion zone around the intake may need to be changed to account for different contour types or particular operations.
Example	<p>In steep areas, the exclusion area may need to be increased to avoid bait falling in to the waterway.</p> <p>For other operations (eg, along farm streams), the officer may allow bait closer to the water edge as long as the bait can be laid in such a way as to ensure that none falls in the water (eg, using trickle feeding).</p>

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CONDITION 31: Water Supply Mitigation: Reporting	
The applicant shall maintain a list of water mitigation measures provided under Conditions 25 and 30, which shall be available, on request, to (<i>insert the name of the public health unit from page 1 of the application form</i>).	
Scope	Discretionary for aerial application of 1080.
Rationale for the condition	This helps the officer to monitor how operators are complying with Conditions 24 and 29 – and encourages operators to comply. The condition also gives the officer the opportunity to amend, stop or suspend the operation if any mitigation measures are inadequate.
Commentary	The officer should recognise the need to request this information sufficiently in advance of the commencement of an operation, with at least 48 hours notice, to allow the applicant to address any concerns raised by the officer without causing operational delays.
Modification options	Where the numbering of conditions in the permission differs from the Model Permit Conditions, the references to Conditions 25 and 30 will need to be changed to reference whichever conditions provide for mitigation measures.
Example	In an aerial operation with no ground component, Conditions 24 and 29 could be deleted as unnecessary. Note this would affect the numbering of the mitigation conditions.

CONDITION 32: Water Supply Testing: Reporting	
The applicant shall provide, or arrange for the provision of, the outcome of all water testing to (<i>insert the name of the public health unit from page 1 of the application form</i>) within 24 hours of receipt of the testing results. In the event that water testing reveals VTA contamination over the PMAV,* the applicant shall discuss any further proposed mitigation measures with (<i>insert the name of the public health unit from page 1 of the application form</i>) and continue testing in accordance with the requirement for monitoring to establish compliance with the Drinking-Water Standards of New Zealand.	
Scope	For aerial application of 1080.
Rationale for the condition	This helps the officer to monitor how operations are complying with the conditions and ensures that there is a process in place to deal with the situation where high levels of VTA contamination are discovered.
Modification options	The time period in which the water-testing outcome must be reported could be decreased if the risk to public health from contaminated water is exacerbated by allowing 24 hours between discovery and notification of the results to the officer.
Example	Where there is a real risk of a substantial drop of 1080 bait into a public water supply or waterway from which many households draw water, the officer may reduce the time limit on notification.

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Case examples

Case example 1: Managing risk around roads and vehicle tracks



Legend	
Road 1	***
Road 2	***
Road 3	***
Road 4	***
Road 5	***

Scenario

An applicant wishes to aerially apply 1080 over 4,800 ha of the Ahaura Forest, an area comprising open beech forest and commercial forestry. The forest contains about 45 km of formed roads and vehicle tracks (Roads 1–5 as marked on the map), to which there are five main access points.

The applicant says that a large exclusion on the entire road network (as potentially envisaged by the Model Permit Conditions) would exclude a significant proportion of the operational area from aerial control and would therefore undermine the efficacy of control and increase the cost of the operation. Therefore, the applicant proposes that all the roads be sown and cleared instead, as permitted under Condition 16.

The officer consults with the relevant land manager and determines the following:

- Road 1 is a well-formed gravel road, providing river access – popular with families. It has the highest level of public use (more than 20 people per day on average).
- Road 2 is a rough, seldom-used 4WD track, mostly through steep, native bush. It is unusable in winter due to mud.
- Road 3 is a well-formed track and popular route for hunters accessing the native bush.
- Roads 4 and 5 are seldom-used commercial forestry tracks with lockable gates at their access points. Most use of these roads takes place at weekends when local families undertake firewood collection.

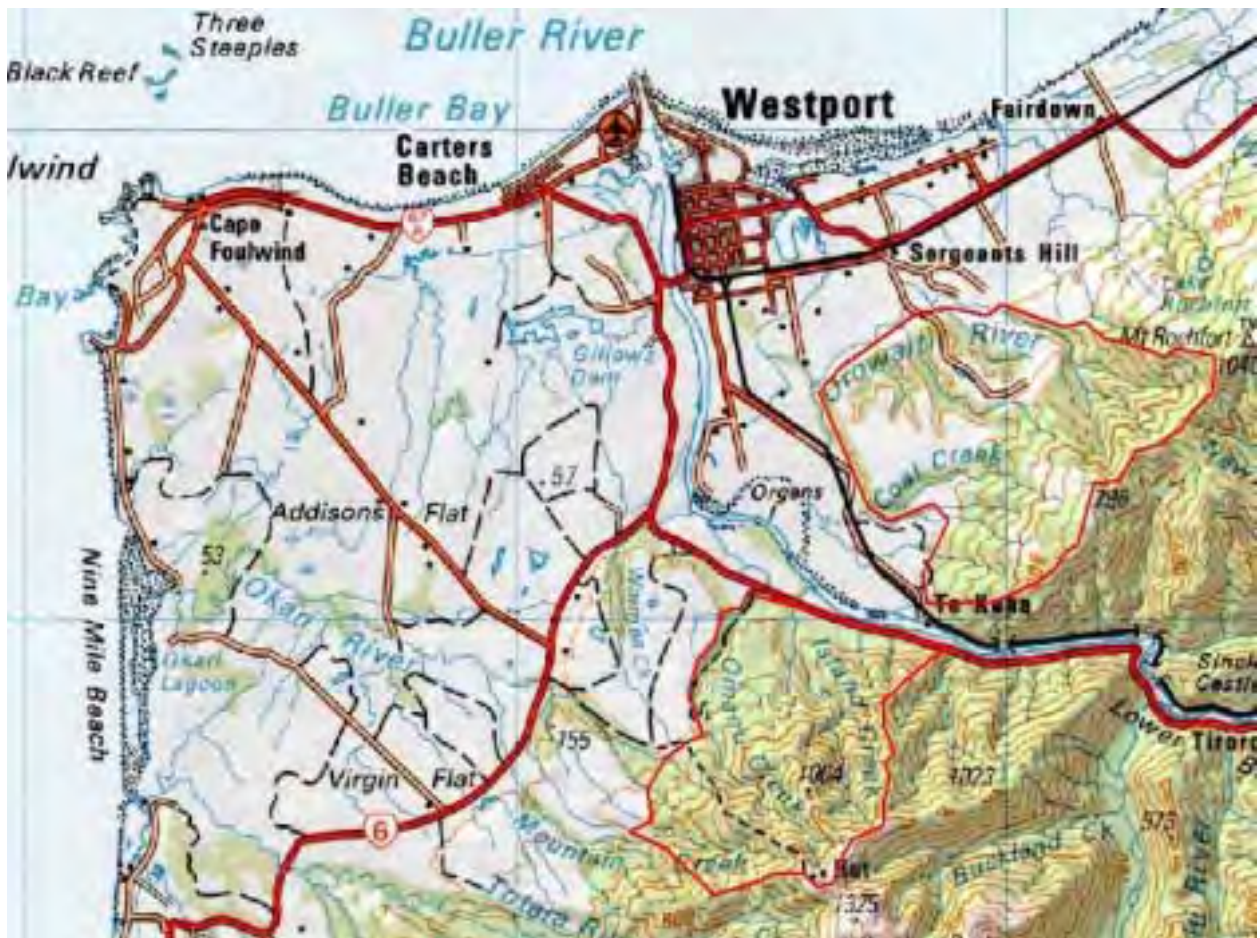
The officer seeks clarification from the applicant and determines that it is not practical to clear the 45 km of roads within 24 hours, that the maximum amount of roads that could be cleared within 24 hours is approximately 20 km and that there will be a significant loss of efficacy if large exclusions are required on all roads.

Model Permit Condition	Applicable?	Modification
Conditions 1–5	✓	[Not covered in this example]
Notifications Conditions 6–8 Condition 9	✓ x	[Not covered in this example]
Accidental direct exposure to VTAs		
Condition 10	✓	[Not covered in this example]
Condition 11. No VTA shall be ground applied within the distance listed below, and not where it is within sight of the following walking and vehicle tracks: Road 3 (on the attached map): 40 m		Road 2 is a little-used track only accessible by four-wheel drives, and so the officer decides to allow bait to be applied along it. It will be listed under Conditions 16 and 17, <i>not</i> Condition 11. Road 3 is an easily accessible track that appears to be used quite often by hunters. This means it is inappropriate to allow application of bait along this road (as requested by the applicant) and the road should be listed under Condition 12. Calculating the exclusion distance: The base 80 m distance can be significantly reduced because: <ul style="list-style-type: none"> • the terrain is steep • the track has low public usage • most users are experienced hunters (rather than children). The officer sets the distance at 40 m. Since roads 4 and 5 are seldom used and have lockable gates, the officer decides to allow bait to be applied along these tracks; they will be listed under Conditions 16 and 17, <i>not</i> Condition 11.
Condition 12. No VTA shall be aerially applied within the distance listed below, and not where it is within sight of the following roads and lay-bys: Road 1 (on the attached map): 80 m	✓	Road 1 has relatively high public usage and is popular with families. This means it is inappropriate to allow application of bait along this road (as requested by the applicant) and the road should be listed under Condition 12. The officer maintains the base 80 m distance because: <ul style="list-style-type: none"> • the road is in a relatively open area • it is commonly used by families.
Conditions 13–15	✓	[Not covered in this example]

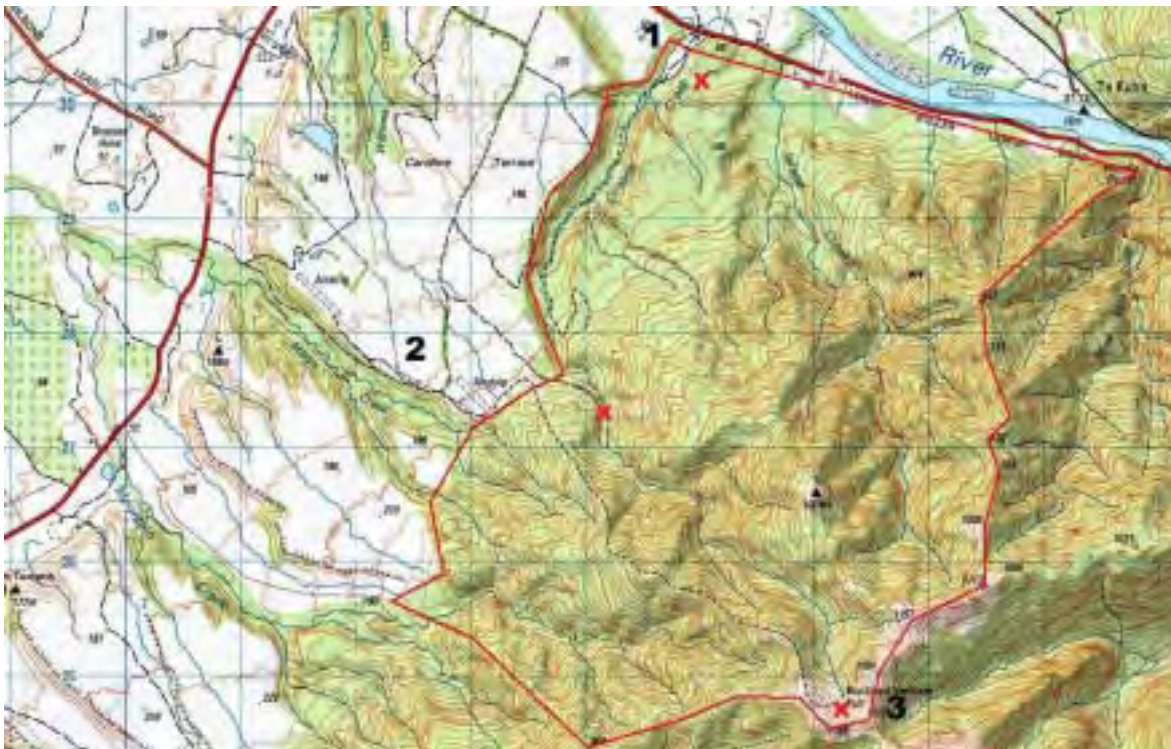
Model Permit Condition	Applicable?	Modification
<p>Condition 16. The applicant may aerially apply 1080 to the following walking and vehicle tracks, but not during, or within 24 hours of the start of, school holidays, public holidays or public holiday weekends.</p> <p>Road 2 (on the attached map) Road 4 (on the attached map) Road 5 (on the attached map)</p> <p>If the applicant aerially applies 1080 to any of the above listed roads, they shall inspect those roads as soon as possible, and not more than 24 hours, after the VTA application and make reasonable efforts to find and remove all bait and, if encountered, animal carcasses; provided the gates remain locked from the time of application until after the inspection and following verification that no vehicles are within the application area at the time of locking the gates.</p>	✓	<p>Roads 2, 4 and 5 will have bait applied along them but need to be cleared of bait as soon as possible. These roads need to be listed under Condition 16.</p> <p>Since Roads 4 and 5 have lockable gates, which would severely limit access, the officer also makes it clear that the gates on these roads must be locked until after the inspection. The officer modifies the Model Permit Condition accordingly.</p>
<p>Condition 17. The applicant shall undertake a second inspection of the following walking and vehicle tracks and make reasonable efforts to find and remove all bait and, if encountered, animal carcasses.</p> <p>Road 4 (on the attached map) Road 5 (on the attached map)</p> <p>The second inspection shall be made at least 24 hours after the VTA application. It should be timed to take place either:</p> <ul style="list-style-type: none"> i. immediately after the occurrence of strong winds; or ii. immediately before the weekend or commencement of school holidays or public holidays; whichever occurs first. 	✓	<p>Road 2 is virtually unusable in winter, and so the officer decides not to require a second clearance under Condition 16. However, a second clearance is required for Roads 4 and 5, which are still used in winter.</p>
Conditions 18–21	✓	[Not covered in this example]

Model Permit Condition	Applicable?	Modification
Contamination of water supplies		
Conditions 22–23	✓	[Not covered in this example]
Condition 24	x	
Conditions 25–28	✓	[Not covered in this example]
Condition 29	x	
Conditions 30–32	✓	[Not covered in this example]

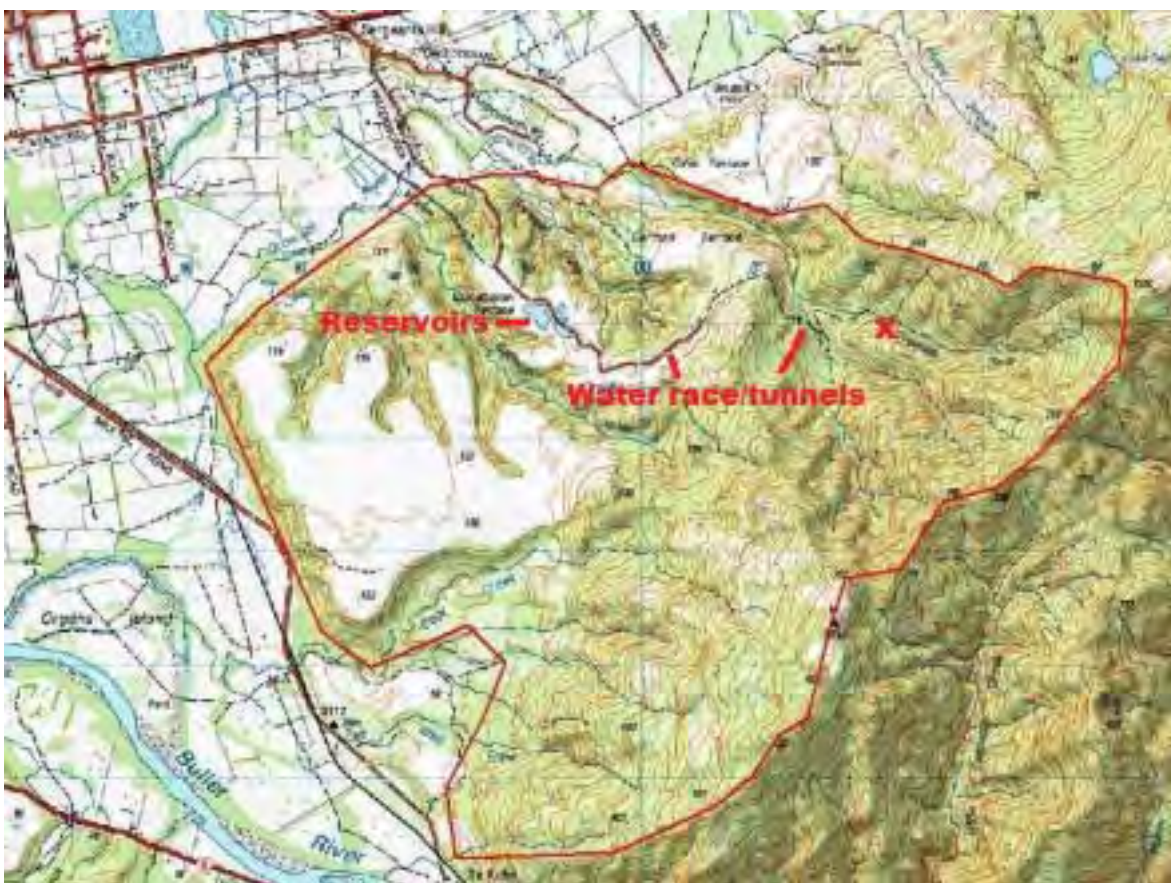
Case Study 2: Managing risk around water supplies



Southern block



Northern block



Scenario

An aerial 1080 operation is planned in winter over two blocks immediately north and south of the Buller River (see maps).

The southern part of the operation includes three water supplies:

1. The domestic water supply for a house, drawn from a small unmarked stream east of Omanu Creek.
2. The rural water supply for Cape Foulwind, drawn from the south branch of Omanu Creek, and managed by the local council.
3. The water supply for Buckland Peak Hut, managed by DoC.

The applicant advises that they have notified each of the water supply managers and proposes excluding 50 m each side of water supply intakes 1 and 2, continuing 200 m upstream of the intake point, as permitted under Model Permit Condition 24. The applicant does not propose a water supply exclusion for water supply 3 as the hut has a rooftop rainwater supply.

In making a decision, the officer:

- consults with the local council and finds that the Cape Foulwind rural water supply is not a potable water supply but is piped 16 km to provide stock water at the cape
- confirms with DoC that the water supply for the Buckland Peak Hut is a rooftop rainwater supply and that it is a six-bunk hut with low use during winter.

The northern part of the operation includes one water supply, being the public water supply for Westport and adjoining residential areas.

The water supply is from a creek catchment in the hills behind Westport and is transferred to three large reservoirs by a series of underground tunnels and open water races. There is also a treatment plant and covered storage for about half a day's supply of treated water, which is then piped to town.

However, the officer also identifies a risk to the water supply from the open water races and reservoirs, as these are exposed to the aerial application of bait.

Model Permit Condition	Applicable?	Modification
Conditions 1–5	✓	[Not covered in this example]
Risk area: notifications Conditions 6–8 Condition 9	✓ x	[Not covered in this example]
Risk area: accidental exposure to VTAs		
Condition 10. No VTA shall be aerially applied within the distance listed below, and not where it is within sight of, the following huts, access points, camping and public areas: Buckland Peak Hut: 40 m Warning signs shall be placed at each of the listed hut(s), camping and public amenity area(s) before the VTA(s) are laid in adjoining areas.	✓	Buckland Peak Hut is a six-bunk hut with low use during winter and lies within the operational boundary. Therefore it must be listed under Condition 10. Calculating the exclusion distance: The operator requested an exclusion distance of 40 m around the hut. The officer agrees because: <ul style="list-style-type: none"> the hut has low use in winter although on the open tops, the terrain around the hut is relatively steep. An 80 m exclusion distance would be excessive given the risk. The officer sets the exclusion distance at 40 m. Since it would have an exclusion zone under Condition 10, there is no need for Conditions 22–26 to apply to Buckland Peak Hut.
Conditions 11–14	✓	[Not covered in this example]
Condition 15. An aircraft that is carrying out an aerial application must not, when flying to or from the area where the VTA is applied, fly over the following 'no fly' areas: Buckland Peak Hut Westport public water supply reservoirs and canal	✓	Since Buckland Peak Hut has a rooftop rainwater supply, the officer wants to be assured that no bait will be accidentally dropped on the hut roof during sowing of adjoining areas. Therefore, Buckland Peak Hut should be listed under Condition 15. Given the magnitude of potential risk from an unintentional spillage of bait into the Westport public water supply, it too should be listed under Condition 15.
Conditions 16–21	✓	[Not covered in this example]
Risk area: contamination of water supplies Condition 22 Condition 23 Condition 24	✓ ✓ x	[Not covered in this example] [Not covered in this example]

Model Permit Condition	Applicable?	Modification
<p>Condition 25. For an aerial application of 1080, applicants must provide mitigation to all households and huts/camping areas that:</p> <ul style="list-style-type: none"> • source water from inside the operational area; or • source their domestic water supply within 3 km of the operational area, where the water source is a surface waterway that flows through or rises within the operational area. <p>This applies where mitigation is requested by household occupiers or managers of huts/ camping grounds.</p> <p>Mitigation shall involve either or both of the following:</p> <ol style="list-style-type: none"> i. No 1080 shall be applied within 50 m of the water supply intakes. For flowing surface waterways, the 50 m exclusion shall extend for a distance of 200 m upstream from the point of intake. ii. The domestic water supply shall be temporarily disconnected until such time as water testing finds no VTA contamination above 50 percent of the Ministry's PMAV,* in accordance with the requirements of the Drinking-water Standards of New Zealand. If no temporary water source is available, an adequate alternative potable water supply (to be used for drinking and cooking) shall be provided to the affected household, the amount per day agreed with the household, until testing is completed. 	<p>✓</p>	<p>As this is a 1080 operation, the distance from the operational area within which operators must provide mitigation for residents should be 3 km.</p> <p>Water Supply 1 is the water supply for a house, drawn from a small, unmarked stream east of Omanu Creek. As it lies within the operational boundary, and supplies a household, the water supply counts as a domestic water supply for the purposes of Condition 25. Therefore, Condition 25 would apply to Water Supply 1.</p> <p>Since it would have an exclusion zone applied under Condition 10, there is no need for Conditions 22–26 to apply to Buckland Peak Hut (Water Supply 3).</p> <p>Any other water supplies within 3 km of the boundary of the operational zone and that draw water from a waterway that passes through the operational area may also require mitigation. It is the operator's duty to ensure that all such water supplies are correctly identified.</p> <p>This could include any water supplies within 3 km of the operational area that draw water from the Buller River below its confluence with Island Creek (since Island Creek flows through the operational area).</p>

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Model Permit Condition	Applicable?	Modification
Condition 26	✓	[Not covered in this example]
Condition 27	✓	[Not covered in this example]
Condition 28	✓	[Not covered in this example]
Condition 29	x	
<p>Condition 30. For an aerial application of 1080, applicants must provide mitigation to all public water supplies that:</p> <ul style="list-style-type: none"> • source their public water supply from within the operational area; or • source their public water supply within (<i>specify distance</i>) of the operational area where the water source is a surface waterway that flows through or rises within the operational area. <p>Mitigation shall be mutually agreed in writing between the applicant and water supply managers and involve either or both of the following:</p> <ol style="list-style-type: none"> i. No 1080 shall be applied within 200 m of the water supply intakes. For flowing surface watercourses, the 200 m exclusion shall extend for a length of 400 m upstream of the point of intake. ii. If an interim water supply is available, the affected water supply shall be temporarily disconnected until such time as water testing finds no VTA contamination above 50 percent of the Ministry's PMAV,* in accordance with the requirements of the Drinking-water Standards of New Zealand. 		<p>Since it is not a drinking water source for humans, the Cape Foulwind rural water supply (Water Supply 2) would not be covered by Condition 30. By contrast, the public water supply for Westport in the northern block is covered by Condition 30. Since the water supply consists of an intake, reservoirs and a canal, the suitable exclusion distance in this case would be 200 m from the water supply intake and 400 m upstream; 200 m around the edge of the reservoirs and 200 m on both sides of the water race where it is in the open.</p>
Condition 31	✓	[Not covered in this example]
Condition 32	✓	[Not covered in this example]

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Case Study 3: Managing high-risk exclusions



Scenario

An applicant proposes a hand-laid possum control operation, using sodium cyanide paste in the Cape Foulwind area.

The operational area is mostly rolling farmland but is traversed by the 4 km Cape Foulwind Walkway, which runs from the lighthouse at Cape Foulwind to the seal rookery near Tauranga Bay. Car parks are located at each end of the walkway and Limestone and Lighthouse roads are both used to access these car parks.

The seal colony attracts an estimated 80,000 to 100,000 visitors every year, with many of these visitors walking all or part of the walkway. Many of the visitors are tourists or families with young children. The walkway passes through undulating farmland, with coastal cliffs on the seaward side.

The officer discusses the likely exclusion distance with the applicant. The applicant states that a large exclusion either side of the walkway would take in the entire coast cliff area, which is where the highest possum abundance is anticipated, and would therefore undermine the efficacy of the operation and that an alternative trapping regime in the cliff area would see budget overruns.

The officer also discusses the application with the track manager, who confirms that the walkway passes as close as 2–5 m to the edge of the coastal cliffs but that the cliffs are steep and inaccessible. Past operations have shown that signs located in the car parks attract considerable vandalism.

Model Permit Condition	Applicable?	Modification
Conditions 1–5	✓	[Not covered in this example]
Risk area: notifications		
Conditions 6–8	✓	[Not covered in this example]
<p>Condition 9: The officer amends the Model Permit Condition to read:</p> <p>“The applicant shall give public notice in the following media (eg, newspapers, community newsletters) of the proposed application of the VTA(s).</p> <p>Westport News</p> <p>The notice must be given sufficiently prior to, but within two months of, the proposed application of the VTA(s). The notice shall specify the following:</p> <ol style="list-style-type: none"> i. The approximate date that the VTA(s) will be applied. ii. The name and nature of the VTA(s). iii. A description of the area over which the VTA(s) will be applied. iv. The location(s) where the public may view maps of the area over which the VTA(s) will be applied and the times when such maps can be viewed. v. The name and address of the person responsible for applying the VTA(s). <p>The applicant must provide a copy of the public notice and the date(s) and media in which it was published to (<i>insert the name of the public health unit from page 1 of the application form</i>) before commencing the operation.”</p>		
Risk area: accidental exposure to VTAs		
Condition 10	✓	[Not covered in this example]
<p>Condition 11. No VTA shall be ground applied within the distance listed below and not where it is within sight of the following walking and vehicle tracks:</p> <p>Cape Foulwind Walkway: 100 m</p> <p>As an exception to this condition, VTAs shall be permitted within 100 m of the Cape Foulwind Walkway but only where they are on steep and inaccessible coastal cliffs and contained in bait stations that are clearly marked with a ‘Warning: Poison’ sign.</p>	✓	<p>Cape Foulwind Walkway is used by up to 100,000 people each year (an annual daily average of 274 people) and lies within the operational boundary, so it must be listed under Condition 11.</p> <p>Calculating the exclusion distance: Although the recommended exclusion area for ground control is 20 m, the officer decides to increase this significantly to 100 m because:</p> <ul style="list-style-type: none"> • there is very high public use • users are largely tourists and families who may be more at risk than other groups • the terrain is open farmland • the VTA type and method of application (easily accessible) is relatively dangerous. <p>In light of the cliff-face issue, the officer also talks with the track manager, who confirms that the walkway passes as close as 2–5 m to the edge of the coastal cliffs, but that the cliffs are steep and inaccessible.</p>

Model Permit Condition	Applicable?	Modification
		On that basis, the officer advises the applicant that cyanide use on the coastal cliffs themselves will be acceptable, so long as the cyanide is presented in bait stations that are clearly marked with a 'Warning: Poison' sign. On the inland side of the track, the bait must not be applied within 100 m of the track.
<p>Condition 12. No VTA shall be ground applied within the distance listed below and not where it is within sight of the following public roads and road lay-bys:</p> <p>Car parks at Tauranga Bay and Lighthouse Road: 100 m</p> <p>Lighthouse Road: 100 m</p> <p>Limestone Road: 100 m</p>		<p>The car parks and roads at each end of the Cape Foulwind Walkway are likely to receive similar usage to the walkway itself, and they lie within the operational boundary and need to be listed under Condition 12.</p> <p>Calculating the exclusion distance: Since these areas have a similar risk profile to the walkway, the same 100 m exclusion distance would apply.</p>
Conditions 13–18	✓	[Not covered in this example]
Conditions 19–20	✓	[Not covered in this example]
<p>Condition 21. During the period in which bait remains toxic, warning signs shall be inspected weekly in the following locations:</p> <ul style="list-style-type: none"> • Car parks at Tauranga Bay and Lighthouse Road • Lighthouse Road • Limestone Road <p>Any signs that are damaged, vandalised or otherwise become illegible shall be replaced within 24 hours of discovery.</p>	✓	Tourists and families with young children frequent this area, so signs need to be well maintained to ensure that at-risk people are informed of the risks. Since there has been a degree of vandalism in the past, this condition should be imposed to ensure that operators regularly check and replace vandalised signs.
<p>Risk area: contamination of water supplies</p> <p>Conditions 22–24</p> <p>Conditions 25–26</p> <p>Conditions 27–29</p> <p>Conditions 30–32</p>	<p>✓</p> <p>x</p> <p>✓</p> <p>x</p>	<p>[Not covered in this example]</p> <p>[Not covered in this example]</p>

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Appendix 1: Checklist for assessing VTA applications

To be used in conjunction with the application form

Applicant:

Date received:

Operation:

Start date:

Finish date:

- Information on application complete
 - Operation area clearly defined by provided map and description (Appendix 3)
 - Operational description satisfactory
 - Operator identified
 - Resource consent number included
 - Environmental and health impact assessment information adequate
 - Exclusion areas and boundaries adequately described
 - Water supplies identified
 - Exclusion zones adequate
 - Tracks identified in application and marked on map
 - Houses, huts, public roads in operational area identified
 - Adequate exclusion zones
 - All landowner's name, addresses and phone numbers provided
 - Indication that written permission has been given
 - Schools identified and specified as to whether to be visited
 - Notification required for and provided to: GPs, vets, hospitals, police
 - Recreational user groups identified
 - Public information and consultation campaign adequate
 - Newspapers, media
 - Visits/phone neighbours
 - Public meetings
 - Meets the requirements of the Communication Guidelines for Aerial 1080 Operations
 - Yes / No
 - Other.....
 - Location of notices specified
- Permission gained by applicant from:
- Local authority
 - DoC

Appendix 2: Notes on methods of application, bait presentation, terrain and vegetation variables and identifying the potentially exposed population

Methods of application

There are a number of methods of applying VTAs, each with different associated hazards. The method used must be appropriate to the terrain in question and allow the operator certainty around the accuracy of bait placement. The concentration of bait can vary significantly depending on the application method, the VTA being used, the target species and the environment.

In certain circumstances, an operator may use a combination of ground and aerial applications. For example, an operation might involve aerial 1080 application for a wide area with ground application along the periphery to allow for control of possums in areas that abut a residential area and that require greater accuracy of bait placement.

Table A.1: Overview of VTA application methods

Application method	Substance	Bait placement and coverage
Aerial broadcast	1080	Potential for bait to be placed inaccurately. Bait is generally well spread, particularly if a low-sow bucket is used.
Aerial trickle	1080	More accurate placement than aerial broadcast; bait is generally well spaced.
Aerial cluster	1080	Relatively accurate placement; however a large cluster of bait, so exposure is to many pellets rather than spaced single pellets.
Open ground application: turf spits, hand broadcast, ground-laid paste	1080, cyanide, yellow phosphorus, DRC 1339	Accurate placement. Coverage rates vary depending on terrain, target species and VTA.
Hand-based application from an aircraft	DRC 1339	Accurate placement. Coverage rates vary depending on terrain, target species and VTA.
Bait stations	1080, cyanide	Placement divided into less or more than 1 m above the ground. Coverage rates vary depending on terrain, target species and VTA.

Aerial application

As noted in Table A.1, 1080 is the only VTA that can be aerially applied as it is used for possum control in remote areas where ground application would be difficult or impossible. There are various application methods:

- Pellets or carrot bait broadcast from a hopper underneath the aircraft with approximately 120 m swathe, 2–6 kg/ha sowing rate for possums (greater amount may be used for rabbits)

- Pellets or carrot bait trickle fed from a hopper underneath the aircraft ('clustering' of bait is also sometimes used)
- Pellets hand dropped from the aircraft (rarely used).

The ERMA reassessment decision notes that only the following formulated substances are approved for aerial application:

- cereal based pellets containing 0.4–0.8 g 1080/kg
- cereal based pellets containing 1.5–2.0 g 1080/kg
- soluble concentrate containing 200 g 1080/L (only when applied to food baits as per controls).

Aerial drops may release 1080 into areas outside the planned operational area through overflying (release outside the area due to error or mechanical problems); bait drift or accidental release. Operators are required to use GPS logs to confine aerial applications of 1080 to operational areas and to ensure that the application preserves exclusion zones around dwellings, roads and tracks, schools and drinking-water supplies.

Ground application

Ground application of VTAs allows for greater accuracy of bait placement; however, it is limited in terms of the area that can be covered. 1080, cyanide, yellow phosphorus and DRC 1339 can all be ground laid using:

- bait stations
- bait bags
- ground distribution (hand broadcast) of bait
- gels or pastes in earth 'spits'
- small dollops of paste or gel on trees and fence posts, often marked with white flour.

Note that the PHU should check the formulation to see which application methods are allowed because some are only allowed to be used in contained ground based application.

Bait presentation

There are various ways of presenting bait that aim to make the bait as attractive and as accessible as possible to the target species while reducing the risk to other species, including humans.

1080 is incorporated into a number of different baits at varying concentrations, depending on the target species, the method of application and the type of bait least likely to attract non-target species. ERMA, in its reassessment of the use of 1080, noted that public hazards from various forms of exposure to 1080 are relatively low. It stated that the greatest hazard relates to unsupervised children finding and eating bait (ERMA New Zealand 2007a).

1080 solution may be coated on carrot or apple pieces, mixed with cereal to form hard pellets or made into paste or gel formulations. Carrot bait for aerial distribution is chopped and screened to remove small pieces to reduce the risk of poisoning non-target birds. Cereal pellet bait is used for both aerial and bait station control. Paste bait, and more recently gel bait, is used for ground-based follow-up maintenance control. A range of masking agents, such as cinnamon or orange oil, is added to bait to mask the taste of 1080. Cinnamon is thought to be a partial deterrent to birds and insects; green dye is added to deter birds.

Cyanide is presented as pea-sized pieces of paste placed with a little flour and icing sugar or other lures such as cinnamon or eucalyptus oil on a rock, leaf or stick. Feratox® (a pea-sized encapsulated cyanide pellet) was developed to increase the effectiveness of cyanide and reduce the risk of operators being exposed to hydrogen cyanide vapours. The pellets are placed in a bait station either with similar sized cereal feed pellets or in a peanut-butter paste.

Yellow phosphorus comes in a paste form and is generally applied to turf spits on the ground for rabbit control or in similar ways to cyanide paste for possum control. These two forms of application may be more hazardous in easily accessible areas.

DRC 1339 is most commonly presented as laced bread bait for ground-feeding flocks or as gel bait dropped into tall trees nests by operators being lowered to the nests by helicopter.

Pre-feeding

Pre-feeds are often used to prime target species and to reduce bait shyness. While the pre-feeds themselves are not hazardous, it may be difficult for the public to differentiate between pre-feeds and VTA bait. The presence of pre-feeds without warning signs can cause concern among the public or alternatively can make people complacent about toxic baits if consultation, notification and signage are not adequate or appropriate.

Terrain and vegetation variables

The terrain and vegetation in an operational area can affect public health risks posed by a VTA operation and should be considered when assessing the suitability of the Model Permit Conditions and how they may need to be modified.

Table A.2: Overview of terrain and vegetation variables

Terrain type	Comments related to risk characteristics
Open terrain, flat to gentle contour	Relatively easy for the public to access, particularly if close to residential areas. Bait visible from long distances, regardless of method of application. Unless access is physically limited (eg, fences, ditches, walls), use may present a relatively greater public health risk.
Medium terrain (gentle rolling to hilly contour)	More difficult to access, and terrain and vegetation cover of this type may present a barrier to younger children (depending on proximity to residential areas).
Rough, steep contour	This type of terrain may act as a physical barrier, preventing ready access to bait in an operational area. Some areas of rough terrain will include vehicle or walking tracks that may provide access to otherwise inhospitable landscapes – see Model Permit Conditions 10–12.
Vegetation type	Comments related to risk characteristics.
Light to no vegetation, eg, pastureland, open grassland, sparse tree cover	Bait visible from relatively longer distances. Vegetation does not provide a barrier to accessing the bait.
Medium vegetation coverage (eg, fodder crops, open bush, tussock)	Vegetation cover may limit visibility of bait on the ground or in bait stations and may present a moderate physical barrier to access, particularly for young children.
Heavy vegetation (thick bush, extensive undergrowth)	Vegetation cover significantly limits visibility and presents a physical barrier to accessing the operational area. Note: In some areas, tracks may provide access to otherwise heavily forested or covered areas. Model Permit Conditions 10–12 provide for controls in these circumstances.

Potentially exposed population

Potential exposure to operational areas requires consideration of:

- the degree of public usage
- the types of people who use or have access to the area.

The potentially exposed population will differ for each operation. However, examples of populations that may often be exposed include (but are not limited to):

- local residents or visitors (noting that children may wander or explore more extensively than adults in areas adjoining residential areas or dwellings)
- trampers/day walkers using bush tracks and huts
- hunters
- farming families on the edges of operational areas
- school groups utilising operational areas
- watercraft users using landing sites within operational areas
- any other individuals or groups that recreate within operational areas.

Public usage patterns must be taken into account, in particular when considering the application and/or modification of, for example, Model Permit Condition 10. Areas that receive heavy public use, particularly by young children and if the terrain also allows for relatively ready access to and/or visibility of bait, may warrant a revision of the base distances provided in the Model Permit Condition.

Table A.3 sets out some examples of public use patterns that may influence the use of Model Permit Conditions. Please note: these are examples only and will be influenced by other factors such as seasonal use patterns, events that bring large groups into an area for a short time, and the characteristics of the local and likely visiting populations.

Table A.3: Examples of public use patterns

Intensity of public use	Comments related to risk characteristics
High public use (eg, more than 50 people per day)	Higher public usage may increase the risk of contact with baits due to the large number of people in the area. Some areas may experience intermittent periods of high usage around holidays, long weekends or hunting seasons. In some areas, usage will be concentrated or confined to specific parts of a proposed operational area.
Medium public usage (eg, 20–50 people per day)	There may be some risk of contact with bait due to the number of people, particularly if users include children or, for example, non-English speakers who may not fully understand warning signs.
Low public usage (eg, less than 20 people per day)	A lower concentration of users may lower the risk of contact with bait. However, the types of users must still be considered; small groups or individuals may still be at risk, particularly children.

Consideration of each of these variables is necessary for developing a robust risk assessment process for a VTA operation and for developing an appropriate application and modification of Model Permit Conditions.

Glossary of Terms and Abbreviations

For the purposes of issuing permissions for VTAs under the HSNO Act and its regulations, including the Hazardous Substances (Vertebrate Toxic Agents) Transfer Notice 2004 (as amended) and the 1080 Reassessment decision, the following definitions apply:

Abutting	A property or area physically connected to the operational area
Applicant	For the purposes of these Guidelines, may also include the operator.
DoC	The Department of Conservation
DoL	The Department of Labour
Domestic water supply	A water supply that is privately owned (not used for profit).
ERMA	Environmental Risk Management Authority
HIA	Health Impact Assessment
HSE Act	Health and Safety in Employment Act 1992
HSNO Act	Hazardous Substances and New Organisms Act 1996
Land occupier	Anyone who resides on a property, irrespective of ownership of the property, for example, a tenant, sharemilker and any other employee of a landowner who resides on the landowner's property
NZFSA	New Zealand Food Safety Authority
NZPHD Act	New Zealand Public Health and Disability Act 2000
Officer	Any health protection officer or medical officer of health who holds a current warrant as an enforcement officer under the HSNO Act
Public water supply	Any water supply that is not to a self-supplied building
VTA	Vertebrate Toxic Agent
Sufficiently prior to ...	A period of time that allows an affected party to adopt remedial or preventive action before a VTA is applied (as a general guideline, no less than five days before the planned VTA application)