



**Australian Pesticides &
Veterinary Medicines Authority**

**The Reconsideration of Registrations of
Products Containing Sodium Fluoroacetate (1080)
and their Associated Labels.**

PRELIMINARY REVIEW FINDINGS

May 2005

**Australian Pesticides &
Veterinary Medicines Authority**

**Canberra
Australia**

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This review report for products containing sodium fluoroacetate (1080) is published by the Australian Pesticides and Veterinary Medicines Authority. For further information about this review or the Pesticides Review Program, contact:

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FOREWORD

The APVMA is an independent statutory authority with responsibility for the regulation of agricultural and veterinary chemicals in Australia. Its statutory powers are provided in the Agvet Code scheduled to the *Agricultural and Veterinary Chemicals Code Act, 1994*.

The APVMA can reconsider the approval of an active constituent, the registration of a chemical product or the approval of a label for a container for a chemical product at any time. This is outlined in Part 2, Division 4 of the Agvet Code.

The basis for the reconsideration is whether the APVMA is satisfied that continued use of products containing sodium fluoroacetate (1080) in accordance with the instructions for their use “would not be likely have an unintended effect that is harmful to animals, plants or things or to the environment” (s34 (1)(a)iii).

The requirements for continued approval of a label for containers for a chemical product are that the label contains adequate instructions (s34(1)c). Such instructions include:

- the circumstances in which the product should be used;
- how the product should be used;
- times when the product should be used;
- frequency of the use of the product;
- the withholding period after the use of the product;
- disposal of the product and its container;
- safe handling of the product.

A reconsideration may be initiated when new research or evidence has raised concerns about the use or safety of a particular chemical, a product or its label.

The process for reconsideration includes a call for information from a variety of sources, a review of that information and, following public consultation, a decision about the future use of the chemical or product.

In undertaking reviews, the APVMA works in close cooperation with advisory agencies including the Office of Chemical Safety (OCS) within the Department of Health and Ageing, the Department of Environment and Heritage (DEH), and State Departments of Agriculture as well as other expert advisors, as appropriate. In this case, the APVMA obtained expert advice from the DEH who assessed the information submitted to the review and provided advice on measures to avoid or minimise environmental effects.

The APVMA has a policy of encouraging openness and transparency in its activities and community involvement in decision-making. The publication of review reports is a part of that process.

The APVMA also makes these reports available to the regulatory agencies of other countries as part of bilateral agreements. Under this program it is proposed that countries receiving these reports will not utilise them for registration purposes unless they are also provided with the raw data from the relevant applicant.

This document is Part 1 of *The Reconsideration of Registrations of Products Containing Sodium Fluoroacetate (1080) and Their Associated Labels – Preliminary*

Review Findings' and relates to all products containing 1080 that have been nominated for review by the APVMA. The review's findings and recommendations are based on information collected from a variety of sources. The information and technical data required by the APVMA to review the safety of both new and existing chemical products must be derived according to accepted scientific principles, as must the methods of assessment undertaken.

The *Preliminary Review Findings* report containing the APVMA's preliminary assessments (*The Reconsideration of Registrations of Products Containing Sodium Fluoroacetate (1080) and Their Associated Labels*, Volume I) and the technical reports (Volume II) for all registrations and approvals relating to 1080 are available from the APVMA website: <http://www.apvma.gov.au/chemrev/chemrev.html>.

COMMENT FROM THE PUBLIC IS INVITED

The APVMA invites persons and organisations to submit their comments and suggestions on this *Preliminary Review Findings* report directly to the APVMA. Your comments will assist the APVMA in preparing the final report.

The *Preliminary Review Findings* report consists of two volumes. Volume I is a review summary which outlines the APVMA review process, gives information to the public about how to respond to the review, summarises the technical assessments from the reviewing agencies and outlines the proposed regulatory action to be taken in relation to the continued registration of sodium fluoroacetate (1080) products. Volume II, which contains the full technical assessment report by the Department of Environment and Heritage, is available on request from the APVMA.

In most cases the review summary (Volume I) should provide sufficient detail to enable response to the review. However, further details are available in Volume II if required.

PREPARING YOUR COMMENTS FOR SUBMISSION

You may agree or disagree with or comment on as many elements of the report as you wish.

When making your comments:

- clearly identify the issue and clearly state your point of view;
- give reasons for your comments supporting them, if possible, with relevant information and indicate the source of the information you have used;
- suggest to the APVMA any alternative solution you may have for the issue.

Please try to structure your comments in point form referring each point to the relevant section in the review summary or the technical report. This will help the APVMA assemble and analyse all of the comments it receives.

Finally **please tell us whether the APVMA can quote your comments in part or in full.**

THE CLOSING DATE FOR SUBMISSIONS IS 31 AUGUST 2005.

Your comments should be mailed to:

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EXECUTIVE SUMMARY

Introduction

The use of sodium fluoroacetate, commonly known as 1080, was pioneered in Australia in the early 1950s as a rabbit poison in Tasmania. Products containing 1080 are now widely used in Australia for vertebrate pest control in agricultural production as well as biodiversity conservation.

1080 is approved for the control of vermin, wild dog/dingo, agile wallaby, feral pig, fox, rabbit and European fox. The terminology ‘vermin’ could actually cover the use of this chemical for a large number of situations. Approved labels do not delineate the complete directions for use for 1080 products nor are they clear in relation to target species for a particular product. Those pests that are known to be controlled using 1080, but which do not appear specifically on approved labels include dingoes, Bennett’s wallaby, rufous wallaby, rats and brushtail possum.

A list of registered 1080 products is shown in Table 1. Annual use of 1080 across Australia amounts to around 200 kg. Information received from State authorities indicates that 25-50 kg 1080 is used annually in Queensland, 25-30 kg in NSW, 10-12 kg in SA, 13-15 kg in Tasmania (with a declining trend over the last three years), and an average 38 kg over the last three years in WA. Other States are understood to use similar amounts.

Across mainland Australia, rabbit control consumes the most 1080, followed by wild dog control. Current usage in Tasmania is mainly against native browsing and grazing animals, with incidental rabbit control, and reflects the unique pest pressure in that jurisdiction.

The APVMA reconsiders the registration of agricultural and veterinary chemicals in the marketplace where potential risks to the safety and performance have been identified. Due to concerns over unintended effect on the environment through the poisoning of non-target animals and concerns about whether product labels contained adequate instructions, products containing 1080 and associated labels were put under review in July 2002.

During public consultation at the commencement of the review, the APVMA received submissions that raised several concerns regarding the continuing availability and use of 1080. These included:

- The poisoning of non-target animals, both native species and domestic animals;
- The potential for secondary impact of sub-lethal doses on eggs and young of non-target species;
- Users not following the instructions for use; and
- The humaneness, ie the mechanism whereby 1080 caused death.

The scope of a reconsideration is determined by the specific concerns about the chemical and certain criteria that are set out in the legislation. In the case of 1080 the concerns relate to the legislative criterion that the APVMA must be satisfied that the use of the chemical would not be likely to have an unintended effect that is harmful to animals, plants or things or to the environment (s34(1)(a)iii). The concerns also relate

to the criterion that the APVMA must be satisfied that product labels contain adequate instructions (s34(1)c).

It should be noted however that humaneness of a pest control agent is not a specific criterion under the Agvet legislation of which the APVMA must be satisfied when registering or reconsidering a registration of a product.

In conducting the review of 1080 the APVMA obtained specialist advice from the Department of the Environment and Heritage (DEH). The impact on the non-target species at a population level, rather than the individual animal, was the basis on which DEH provided advice to the APVMA. This basis is consistent with the Environment Protection and Biodiversity Conservation Act¹ 1999 (EPBC Act) and principles of conservation science.

DEH assessed all the relevant information and data. This included over 150 scientific studies, which were predominantly from Australia (NSW, WA, VIC, SA, QLD and TAS). A significant number were New Zealand studies and the remainder were mostly US studies. The DEH advised that while poisoning of individual non-target animals may occur, there is no evidence that use of 1080 baits leads to an adverse impact on non-target species at a population level. DEH also provided advice on how any risks to non-target animals can be mitigated. The APVMA considered and accepted the expert advice provided by the DEH.

Based on this advice a number of recommendations have been made. For ease of reference these recommendations are bold-faced throughout the Executive Summary, and are also summarised in Section 8 of the document.

Use patterns of 1080

Use patterns of 1080 vary between regions. They are tailored to optimise target specificity and efficacy for the specific ecosystems and region in which 1080 is used. The actual dose rates of 1080 in the baits, and bait distribution rates vary according to the pest to be controlled and the ecosystem in which the baits are laid.

The baits may be applied by aerial or ground distribution. Aerial baiting is generally used where ground baiting is impractical, unduly costly or where the terrain is inaccessible for ground vehicles (for example, aerial baiting of pigs in far north Queensland). Generally, aerial baiting is used for the control of foxes, rabbits, wild dogs and dingoes. Ground baiting is used for rabbits and browsing animals such as wallabies, possums and pademelons, and also for wild dogs, foxes and pigs. In some cases baits are buried or tethered to confine them to the point of application and to minimise taking by non-target species.

Toxicity mode of action

Fluoroacetate is itself not toxic. It is absorbed, activated and metabolized in the mitochondria of the cell to fluorocitrate by a process known as a “lethal synthesis”. It is fluorocitrate that is a potent inhibitor of the enzyme aconitase, a step in the citric acid or

¹ The EPBC Act Administrative guidelines on significance may be viewed at http://www.deh.gov.au/epbc/assessments_approvals/guidelines/administrative/index.html#threatened

Krebs cycle, which is the major energy producing pathway in the body. When this cycle is blocked the cell ceases to function through lack of energy and citrate accumulates in the tissues and plasma.

Environmental assessment

One of the concerns that led to the review of 1080 is the potential for unintended impacts on the environment including effects on non-target animals. The factors that contribute to the unintended effects include environmental contamination by 1080, degree of bait uptake by target animals, and fate of 1080 in baits, poisoned animals and environment. The environmental assessment examined these various factors.

General environmental exposure to 1080 is low, as overall application rates of 1080 are no more than a few grams per hectare, although higher localised exposure is possible where baits are placed. While use of 1080 in this way does not lead to significant contamination of air, soil or water, its dispersal in bait form represents a potential hazard to non-target animals that may take the baits.

1080 is susceptible to microbial degradation, except under arid conditions when microbial activity is low. The ready microbial degradation under moist conditions conducive to microbial activity and the low treatment rates mean that significant leaching is not expected to occur.

Contamination of water is possible, particularly if baits fall directly into watercourses, but any contamination that may occur will be at low levels and rapidly diluted to insignificant concentrations.

Non-target animals, which dwell in the same eco-system as the target pest, can potentially consume the 1080 baits. There are differences in sensitivity to 1080 between different animal species. The sensitivity of animals to 1080 poisoning can be divided into four broad categories: highly sensitive organisms ($LD_{50} < 2$ mg/kg); moderately sensitive organisms ($LD_{50} = 2 - < 10$ mg/kg); relatively tolerant organisms ($LD_{50} = 10 - 40$ mg/kg); and tolerant organisms ($LD_{50} > 40$ mg/kg).

However, the actual level of impact of 1080 on non-target animals cannot be predicted on this basis alone. Other factors that contribute to the equation are frequency, scale, timing and intensity of baiting, baiting materials, methods of deployment, bait placement and environment where baiting occurs. There are also some diet and behavioural differences between different animal species. **Therefore, with careful attention to the concentration of 1080 in baits, bait material, size, preparation, placement and timing, target selectivity can be optimised.**

Reliance on a single bait type can lead to bait shyness in target animals when baiting occurs for prolonged periods at moderate to high intensity. Consequently, if bait shyness results in unconsumed baits, non-target animals may then take them. Thus bait shyness by target animals can increase the likelihood of non-target animals consuming the bait. **To minimise such situations, a range of bait types should be available for each target pest, provided that non-target risks have been carefully evaluated for each bait type.**

The amount of available 1080 in baits decreases when it is leached from the baits. For example, 1080 is easily leached from some bait materials such as oats by rain or even dewfall. Whilst other materials such as carrots are more resistant to leaching, they quickly desiccate and become unpalatable under dry conditions. Meat baits are also detoxified by rainfall, and more so by blowfly larvae. If not taken, meat baits are likely to remain lethally toxic to dogs and foxes for up to 8 weeks, depending on rainfall and temperature, and may retain toxicity for up to a year under arid conditions.

The residual 1080 levels in target animal carcasses need to be taken into consideration when devising baiting techniques and risk mitigation measures to non-target animals. Non-target animals can also be at risk if they consume poisoned animals or their carcasses. The metabolism of 1080 in the target pest and the fate of any residual 1080 in their carcasses are contributing factors to the degree of risk to non-target animals.

Most of the 1080 ingested by animals is rapidly metabolised and/or excreted, with only low levels retained in the carcasses. Residues in rabbit carcasses remain below 1 mg/kg. Some animals retain higher residues, with up to 9 mg/kg measured in rat carcasses. Stomach contents may also retain high residues, in excess of 50 mg/kg for possums. Pig vomitus can contain significant levels 1080.

From adverse incident reports and field observations, dogs are the most common non-target casualties reported, as may be expected given their high sensitivity to 1080, and broad diet which can result in them consuming baits made of most materials. Foxes are also common non-target casualties of rabbit baiting. Among native mammals, unadapted wombats, macropods, possums and some rodents can be killed by herbivore baits. Birds may also be killed by 1080 baiting. Scavenging species such as magpies and crows have been recorded as occasional casualties, together with some introduced species (sparrow, starlings, doves and pigeons). There are also anecdotal reports from the early 1990s of crimson rosella (a highly sensitive species) being killed by carrot baits laid for rabbits.

Correct bait placement, or laying baits in the right place at the right time, was found to be essential if non-target impacts are to be minimised. **Consequently, the review recommends that preliminary free feeding should be used to reduce bait shyness and increase the uptake of poisoned baits by target animals.**

Based on the assessment of the available data, the DEH advised that the use of 1080 does not give rise to widespread or serious impacts on non-target fauna at the population level, although many species are sensitive to the toxin.

In Tasmania 1080 is used to protect horticultural crops and forestry plantations from damage by native herbivores. Broad scale population monitoring conducted hitherto indicates that target and non-target herbivore populations are stable. Based on the available information for review the DEH concluded that the use of 1080 to control browsing native mammals in Tasmania exerts only a temporary “knock-down” effect on target animals and this it does not lead to reductions at population level.

Effectiveness of 1080 in biodiversity conservation

Rabbits, feral pigs, foxes and wild dogs in Australia cause losses to agricultural production and cause environmental damage by removing native vegetation and/or preying on native animals.

Increase in native plant growth and return of associated bird life has been reported following rabbit baiting. In WA, the Western Shield fox-baiting program has allowed the recovery of various species including wallabies, bettongs, possums and numbats. Phascogales in WA appear to be unaffected by fox baiting. In western NSW, populations of rock wallabies and mallee fowl are increasing following successful fox control, while fox control in coastal regions has contributed to high fledging success in threatened shorebirds. Victorian baiting programs have noted positive effects on populations of bush-stone curlews, possums, dunnarts, phascogales, potoroos and bandicoots.

Adequacy of label instructions

The current 1080 product labels do not contain adequate information and instructions for use. Specific directions for use are often contained in a variety of documents issued by individual state agencies. These include regulations, codes of practices, manuals or standard operating procedures. In general, it is acceptable for the labels to be accompanied by leaflets or refer to authoritative State documents, as long as they contain risk mitigation measures to address the requirements stipulated by the Agvet Codes. Under section 14 of the Agvet Codes, the labels need to contain instructions such as the circumstances in which the product should be used, how the product should be used, the frequency of the use of the product, the safe handling of the product and any other matters prescribed by the regulations. The review proposes to find that most current 1080 labels do not meet these requirements.

The review proposes that common principles for 1080 use must be included on all labels. Where there are different information requirements, specific to different ecosystems, then that information may be more appropriately included in extension material. However, it is proposed that it be a condition of registration that the information provided in supporting material (eg Code of Practice for the Use of 1080) must not be changed without prior endorsement of the APVMA to ensure they do not negate the necessary risk mitigation measures, or the labelling requirements stipulated by the Agvet Codes.

The review proposes that labels must specify target species and not use broad terms like vermin and vertebrate pests.

Summary of review recommendations

After consideration of the available information the following regulatory actions are proposed.

Label variations

It is proposed that the APVMA be not satisfied that labels for 1080 products in their current format provide adequate instructions for either preparing or using baits.

It is proposed that the APVMA can be satisfied that labels can be varied to include appropriate instructions. The detailed instructions that are proposed to be included on product labels are provided in the review report. These include the following:

- deletion of all use of the general terminology ‘vermin’ and ‘vertebrate pest(s)’, and replaced with specific target species;
- neighbour notification about imminent baiting;
- minimum distance requirements for bait placement;
- requirement of signage in baiting locations;
- 1080 dose rates;
- bait materials and size;
- bait preparation; and
- storage and transportation of baits.

Conditions of registration

It is proposed that the APVMA be not satisfied that the continued registrations of 1080 products in accordance with their instructions for its use would not be likely to have an unintended effect that is harmful to animals, plants or things or to the environment.

It is proposed that the APVMA can be satisfied of the continued registration of 1080 products if conditions of registration are varied as follows:

- [Registrant] must make the [State] Code of Practice for the Use of 1080 version xxxx available on its website.
- [Registrant] must make hard copies of the Code or Practice available at point of supply.
- [Registrant] must not supply or make available on its website a copy of the [State] Code of Practice for the Use of 1080 in the form other than that specified in these conditions unless [Registrant] has notified the APVMA of any changes to the new form.

Other matters noted as part of the Review

The Preliminary Review Findings document also reports on a number of matters that are related to the continuing use of 1080 but have no direct bearing on the reconsideration process. These include alternative non-chemical vertebrate pest control options, government initiatives regarding 1080 use in Tasmania, literature and public submissions on the humaneness of 1080, government initiatives in relation to animal welfare as well as proposals for the regulatory framework for the supply of 1080 concentrate and baits.

Alternatives to 1080

Several other vertebrate pest control techniques- such as fencing, shooting and trapping, tree guards in plantations, repellents, are available as non-chemical alternatives to 1080.

DEH has examined the currently available information submitted to the review on vertebrate pest control techniques. Fences need to be of high quality if vertebrate pests are not to breach them, particularly in rugged and rocky country. Shooting is often used in conjunction with 1080, particularly for control of remnant populations after baiting, but is generally ineffective when used in isolation, particularly where vegetation and/or terrain reduce visibility. Trapping is useful for some species such as possums and dogs

but generally needs to be combined with other methods. Shooting and trapping also need to be repeated regularly to be effective. Repellents only seem to be effective when browsing pressure is low, and even then do not protect new foliage.

Guard dogs (and llamas) are used on some properties to protect sheep against attack by foxes and wild dogs. Warren ripping is an important part of rabbit control.

Some of these alternative options are often included in vertebrate pest control programs. It is important that all the vertebrate pest control programs thoroughly consider all the available control options.

Government initiatives regarding the use of 1080 in Tasmania

The APVMA notes that the Tasmanian government has commenced phasing out the use of 1080 through the programme known as *Tasmania Together*, one of the goals being the reduced reliance on chemicals. 1080 was targeted as a chemical whose use would cease in Tasmania by 2015. However a recent announcement by Premier Paul Lennon (September 2004) indicated that there had been many calls for the Government to ban 1080 used to control browsing animals in forestry plantations. Although there has been significant progress to reduce the amount of 1080 used in Tasmania (the *Tasmania Together* target for 2005 of 7.6kg (of 1080) has been bettered 12 months early), 1080 would be phased out, and its use eventually banned completely in state forests by December 2005 by the Tasmanian government

The APVMA also notes that the Australian Government made statements during the 2004 election campaign that it would provide assistance in phasing out the use of 1080 in Tasmania. In May 2005, the Prime Minister reiterated the Government's commitment while announcing the agreement between the Australian and Tasmanian Governments that builds on the Tasmanian Regional Forest Agreement. His announcement stated "Use of 1080 on public land will be banned from the end of 2005. Australian Government funds will be used to fast-track development of alternatives to its use on private land".

Humaneness

From public submissions to the nominations and the review scope, it was evident that there was strong public concern about the humaneness of 1080, and that the community considered that this issue should be considered by the review.

Although the APVMA notes the community concerns about animal humaneness related to the use of 1080, animal welfare is not a specific criterion under the Agvet Codes that can be taken into account in making decisions about the future use of 1080. The Preliminary Review Findings report provides an overview of available information of 1080 and animal welfare, but it has not formulated any conclusions on this matter.

Research has been conducted into the use of analgesics and sedatives in 1080 baits, in the interest of animal welfare. The study report commented that if such methods were to be used more widely, further research would be needed to ensure that the additives have no detrimental effect on non-target animals.

A summary of the government initiatives on animal welfare issues is provided in section 12.2.

Regulatory framework for 1080 products

Currently registered products for 1080 fall into one of the three following formulation categories:

- (a) aqueous solution; these are not used directly to poison the animals, but are loaded into baits. These are only available to authorised personnel of Government agencies, not to private landholders.
- (b) shelf-stable baits; last up to 1 year after manufacturing. Semi-dried meat baits and dry oat baits are typical examples of shelf-stable baits. These are supplied to the end-users.
- (c) short-life baits; are to be used within a day after preparation. Fresh meat baits and carrot baits are two examples of the short-life baits. These are supplied to the end-users.

The supply and use of 1080 is regulated by a combination of Commonwealth and State legislation. The APVMA regulates 1080 up to and at the point of retail sale. Once sold or supplied to the end-user, it comes under the regulation of individual State legislation.

As a schedule 7 poison 1080 products are available only to specialised or authorised users who have the skills necessary to handle them safely. Products containing 1080 are declared 'Restricted Chemical Products' under the Agvet Code Regulations. As such, the products can only be supplied to or used by 'authorised person(s)'. Individual States set the authorisation criteria taking the APVMA's and State regulatory requirements in to account. Thus the authorisation criteria vary between States.

Currently aqueous solutions, shelf-stable baits and short-life baits are subject to registration. However the practicality of registering short-life baits has often been raised as an issue given the nature of the container in which it is supplied (usually a plastic bag) and the fact that the bait medium (chicken heads, offal, carrots etc) is perishable.

The review proposes that while the three product types (aqueous solutions, shelf-stable baits and short-life baits) are agricultural chemical products a more appropriate regulatory framework for 1080 product supply and use instructions would be as detailed in the following table:

Proposed regulatory framework for 1080 product supply and use instructions

Product	Regulatory status	Information to user
Aqueous solutions	Registered	Label instructions on how to use concentrate in bait medium
Shelf-stable baits	Registered	Label instructions on how to lay baits. Label can include leaflet or reference to State Code of Practice
Short-life baits	Permit	Supply of leaflet on how to lay bait and adherence to State Code of Practice is a condition of the permit

1. INTRODUCTION

The use of sodium fluoroacetate, commonly known as 1080, was pioneered in Australia in the early 1950s as a rabbit poison in Tasmania. Products containing 1080 are now widely used in Australia for vertebrate pest control in agricultural production as well as biodiversity conservation.

1080 is approved for the control of vermin, wild dog/dingo, agile wallaby, feral pig, fox, rabbit and European fox. The terminology ‘vermin’ could actually cover the use of this chemical for a large number of situations. Approved labels do not delineate the complete directions for use for 1080 products nor are they clear in relation to target species for a particular product. Those pests that are known to be controlled using 1080, but which do not appear specifically on approved labels include dingoes, Bennett’s wallaby, rufous wallaby, rats and brushtail possum.

1.1 Regulatory status of 1080 in Australia

In July 2002, twenty-five products containing 1080 were put under review. Since then, registrations for five of those products have been lapsed. Four new products have been registered since the commencement of the review and are subject to the review outcomes as a condition of registration. For further details, see Table 1.

Table 1. Registered products containing 1080

Product No.	Nominated Product Name	Formulation	States registered
33890 ^a	Rentokil AF Sodium Monofluoroacetate Tenate (1080) Brand Vermin Destroyer	Powder	-
40573	Foxoff Fox Bait	Manufactured meat meal baits	NSW, QLD, VIC, SA, WA, NT
42384 ^a	Agile Wallaby Bait	Cereal	-
42497 ^a	Feral Cat Baits	Dry meat	-
42450	1080 Bait for the Control of Rabbits	Oat bait	SA
42458	1080 Baits	Carrot bait	TAS
42498	1080 Concentrate (Red)	Aqueous solution	WA
42499	1080 Concentrate (Black)	Aqueous solution	WA
42500	1080 Impregnated Oats (Wild Dog Control)	Oat bait	WA
42501	“One Shot” 1080 Impregnated Oats	Oat bait	WA
42534 ^a	Dried Meat 1080 Fox Baits	Dried meat bait	-
42538	1080 Impregnated Oats (Fox Control)	Oat bait	WA
42624 ^a	Special Fox Baits	Manufactured meat bait	-
42720	1080 Baits for the Control of Foxes	Fresh meat bait	SA
46434	Foxoff Econobait	Manufactured meat meal baits	NSW, QLD, VIC, SA, WA, NT

Product No.	Nominated Product Name	Formulation	States registered
49350	1080 Oats Rabbit Bait	Oat bait	VIC
49351	1080 Carrots Rabbit Bait	Carrot bait	VIC
49352	1080 Pellets Rabbit and Feral Pig Bait	Cereal pellet	VIC
49354	1080 Predator Bait	Fresh meat bait	VIC
49355	1080 Fox Bait	Fresh meat bait	VIC
49384	Doggone Wild Dog Bait	Manufactured meat meal baits	ACT, NSW, QLD, VIC, SA, WA, NT
50304	Rabbait 1080 Oat Bait	Oat bait	NSW, VIC, SA, WA, TAS
50911	Yathong Fox Bait	Fresh meat bait	NSW
52954	1080 Ready-to-Lay Rabbit Oat Bait	Oat bait	NSW, QLD, VIC, SA, WA, TAS
54616	1080 Dried Meat Fox Baits	Dried meat bait	WA
53187 ^b	Pro-bait 1080 fox bait	Dried meat (salami style) bait	WA
57743 ^b	1080 Dried meat wild dog baits	Dried meat bait	WA
57825 ^b	1080 Bait for the control of wild dogs	Meat bait	WA
57956 ^b	ACTA 1080 concentrate	Aqueous solution	WA

a. Product registrations lapsed since the commencement of the review

b. Products registered after the review commenced, and will be subject to the review outcomes as a condition of registration

Annual use of 1080 across Australia amounts to around 200 kg. Information received from State authorities indicates that 25-50 kg 1080 is used annually in Queensland, 25-30 kg in NSW, 10-12 kg in SA, 13-15 kg in Tasmania (with a declining trend over the last three years), and an average 38 kg over the last three years in WA. Other States are understood to use similar amounts.

Across mainland Australia, rabbit control consumes the most 1080, followed by wild dog control. Current usage in Tasmania is mainly against native browsing and grazing animals, with incidental rabbit control, and reflects the unique pest pressure in that jurisdiction.

1.2 Reasons for 1080 Review

The APVMA reconsiders the registration of agricultural and veterinary chemicals in the marketplace where potential risks to the safety and performance have been identified. Due to concerns over unintended effect on the environment through the poisoning of non-target animals and concerns about whether product labels contained adequate

instructions, products containing 1080 and associated labels were put under review in July 2002.

During public consultation at the commencement of the review, the APVMA received submissions that raised several concerns regarding the continuing availability and use of 1080. These included:

- The poisoning of non-target animals, both native species and domestic animals;
- The potential for secondary impact of sub-lethal doses on eggs and young of non-target species;
- Users not following the instructions for use; and
- The humaneness, ie the mechanism whereby 1080 caused death.

1.3 Scope of the Review

The scope of a reconsideration is determined by the specific concerns about the chemical and certain criteria that are set out in the legislation. In the case of 1080 the concerns relate to the legislative criterion that the APVMA must be satisfied that the use of the chemical would not be likely to have an unintended effect that is harmful to animals, plants or things or to the environment (s34(1)(a)iii). The concerns also relate to the criterion that the APVMA must be satisfied that product labels contain adequate instructions (s34(1)c).

In conducting the review of 1080 the APVMA obtained specialist advice from the Department of the Environment and Heritage (DEH). The impact on the non-target species at a population level, rather than the individual animal, was the basis on which DEH provided advice to the APVMA. This basis is consistent with the Environment Protection and Biodiversity Conservation Act² 1999 (EPBC Act) and principles of conservation science.

DEH assessed all the relevant information and data. This included over 150 scientific studies, which were predominantly from Australia (NSW, WA, VIC, SA, QLD and TAS). A significant number were New Zealand studies and the remainder were mostly US studies. The DEH advised that while poisoning of individual non-target animals may occur, there is no evidence that use of 1080 baits leads to an adverse impact on non-target species at a population level. DEH also provided advice on how any risks to non-target animals can be mitigated. The APVMA considered and accepted the expert advice provided by the DEH.

The scope also included assessment of product labels and associated extension material.

It should be noted that, although humaneness in the mechanism whereby 1080 causes death of animals was noted in the scope document, the humaneness of a pest control agent is not a specific legislative criterion of which the APVMA must be satisfied when registering or reconsidering the registration of a product.

² The EPBC Act Administrative guidelines on significance may be viewed at http://www.deh.gov.au/epbc/assessments_approvals/guidelines/administrative/index.html#threatened

1.4 Regulatory options

The basis for a reconsideration of the registration and approvals for a chemical is whether the APVMA is satisfied that the requirements prescribed by the Agvet Codes for continued registration and approval are being met. In the case of 1080, these requirements are that the use of the product in accordance with the instructions for its use would not be likely to have an unintended effect that is harmful to animals, plants or things or to the environment and whether labels contain adequate instructions.

There can be three possible outcomes to a review. Based on the information reviewed the APVMA may be:

- satisfied that the products and their labels continue to meet the prescribed requirements for registration and approval and therefore confirms the registrations and approvals.
- satisfied that the conditions to which the registration or approval is currently subject can be varied in such a way that the requirements for continued registration and approval will be complied with and therefore varies the conditions of registration or approval.
- not satisfied that the requirements for continued registration and approval continue to be met and suspends or cancels the registration and/or approval.

2. FORMULATIONS CONTAINING 1080

Currently registered products for 1080 fall into one of the three following formulation categories:

- (a) aqueous solution. These are not used directly to poison the animals, but are loaded into baits. They are only available to authorised personnel of Government agencies, not to private landholders.
- (b) short-life baits, to be used within a day after preparation. Fresh meat baits and carrot baits are two examples of the short-life baits. These are supplied to the end-users.
- (c) shelf-stable baits, lasting up to 1 year after manufacturing. Semi-dried meat baits and dry oat baits are typical examples of shelf-stable baits. These are supplied to the end-users.

3. APPLICATION AND USE PATTERN OF 1080 PRODUCTS

Use patterns of 1080 vary between regions. They are tailored to optimise target specificity and efficacy depending on the specific eco-systems for each region. The actual dose rates of 1080 in the baits, and bait distribution rates vary according to the pest to be controlled and the ecosystem in which the baits are laid.

The baits are applied by aerial or ground distribution. Generally, aerial baiting is used for the control of foxes, rabbits, wild dogs and dingoes. Ground baiting is used for rabbits and browsing animals such as wallabies, possums and pademelons, and also for wild dogs, foxes and pigs. In some cases baits are buried or tethered to confine them to the point of application and to minimise taking by non-target species.

Rabbits

Queensland

Carrots are the usual bait material for rabbits in Queensland. Pre-feeding (feeding of non-poisoned baits to get the animals accustomed to baits), which normally consists of two exposures, precedes baiting. Baits are laid in furrows at a maximum of 10 kg/km, aiming to provide just sufficient for feeding rabbits based on pre-feed consumption. Application rates may be much less than this as they vary with terrain, rabbit numbers and proximity to warren areas. Aerial application of grain baits has been made to extensive warren systems in southwest Queensland, but only once.

Western Australia

Oats are the preferred bait in WA for reasons of cost and practicality (carrot baits tend to dry out under the arid conditions prevailing during the usual baiting season of late summer to early autumn). Baits are usually prepared by mixing impregnated oats (4.5 mg 1080, or more than twice the lethal dose for a large rabbit) with filler oats to achieve a bait mix of 0.5 or 1% (ie one poisoned grain in 100-200 oats). Assuming an average weight of 40 mg for individual oat groats, these bait mixes contain 560 or 1120 mg/kg 1080. Small amounts of uniformly poisoned oats (400 mg/kg 1080, or 0.016 mg in each 40 mg oat groat) are also prepared from concentrate in WA. Pre-feeding with 1080-free oats is only required with the latter.

The WA Forest Products Commission applies oat baits (mixed from impregnated oats) in trails and bait stations for rabbit control within newly established pine and eucalypt plantations. Baiting only occurs when rain is not expected within 5 days. Bait trails may be laid in furrows, in ribbons directly on the soil surface, or scattered along a trail about 5 m in width. Furrow or ribbon methods apply about 6 kg/km, increasing to 10 kg/km for scatter baiting. Bait stations are loaded with around 2 kg bait. Baits and rabbits are left undisturbed for at least 10 days.

Operators in WA target areas of rabbit feeding and avoid non-target exposure when laying bait trails. For example, baits are laid within paddocks but not in adjacent bushland or within 10-20 m of rabbit shelter areas. The State regulations require that all dead animals found on baited and adjacent properties during baiting, and for 14 days after bait has been removed or eaten, must be disposed of by burial or burning.

South Australia

Oats (375 mg/kg 1080) are also the preferred bait material in South Australia because they are easier to handle and store, and are less attractive than carrots to livestock and some native animals. In addition, the husking of oats by cockatoos, parrots and other birds helps reduce the risk of non-target effects as much of the 1080 is discarded with the husk rather than ingested.

Victoria

Victoria uses pellet, carrot and oat baits, which may be laid in trails or broadcast from the ground or from aircraft (up to 15 kg/ha for carrot baits) according to the Victorian Department of Sustainability and Environment (DSE) directions. Rabbit control programs use 1080 to substantially reduce large populations, or where other methods are considered unsuitable. Untaken baits and rabbit carcasses should be collected within 4 days of baiting and incinerated or buried, with carcass collection and disposal

to continue for 14 days after baiting. Baits should be placed in locations inaccessible to animals other than rabbits.

Long life baits

The commercial product Rabbait is registered in NSW, South Australia, Victoria, Tasmania and WA and must be used in accordance with its label directions and relevant legislation. Baits must be placed in locations inaccessible to animals other than target animals, and recovered for destruction after 4 days.

Wallabies and possums

Wallabies (Tasmanian pademelon and Bennett's wallaby) and other browsing and grazing native mammals (brushtail possums) are controlled using 1080 in Tasmania. Roughly equivalent amounts of 1080 are used for forest and agricultural protection in the State.

The carrot bait product (42458 containing 140 mg/kg 1080) are prepared on-site by mixing a dyed stock solution with the carrot pieces in a cement mixer or tub until even coverage is achieved.

Baits are laid by hand. Trail baiting uses 10-20 kg bait/km. This equates to approximately one gram per hectare 1080, although conversion to an area rate is not straightforward. Baits may also be laid at intervals in piles, ideally of handful size.

The optimum bait size is a 1 cm cube, with small fragments avoided as birds more easily eat them. To further minimise exposure to birds, baits should be laid in the late afternoon. Baits should not be laid until consumption of free feed reaches at least 50%, which may require 2-8 pre-baitings. Frequent repeated 1080 baitings in one area are generally not supported, and no application is permitted within 10 m of any waterway.

Foxes

Different 1080 application methods are used for fox control in Western Australia and the eastern States.

Western Australia

1080 meat baits are widely used for fox control in WA, both in agricultural landscapes and in large-scale aerial operations over conservation estate. Most fox baits are prepared from dry kangaroo (3 mg of 1080 per bait) Department of Conservation and Land Management of Western Australia has recently developed a shelf stable salami-type bait (53187 containing 3 mg 1080 in each 35 g bait. There is also some use of commercial Foxoff products and treated oats for insertion into meat baits. Hens' eggs are sometimes used, but must always be buried.

Trained landholders can purchase baits after obtaining baiting approval from an authorised officer of the Department of Agriculture.

Baits can be buried or tethered where non-target risks are identified, although burial appears to increase the time required for foxes to take baits. Most baits are taken within a few days, but normal practice is to allow 10 days to 2 weeks for a baiting campaign. Scent trails, prepared by dragging a carcass over the ground, are sometimes used to attract foxes to baits, but care must be taken to avoid laying baits along a continuous

scent trail as this may encourage multiple bait takes and possibly bait caching by a single fox. Bait locations should be marked, and untaken baits recovered at the end of a campaign.

Large areas of Western Australia are aerially baited with 1080 four times a year for fox control under the Western Shield program that was introduced in 1996. Coordinated treatment of large areas in this way retards the immigration of new foxes into baited areas and allows recovery of native animal populations. There is relatively little conflict between efficacy and target specificity under this program because of the tolerance to 1080 that has developed in many Western Australian fauna.

Eastern states

Large scale aerial fox control programs do not operate in the eastern States because of the greater susceptibility of resident native fauna to 1080 poisoning (although some aerial baiting with Yathong Fox Bait occurs in western NSW at sites where additional environmental impact assessment has been conducted, and large scale ground baiting has commenced in eastern Victoria under the Southern Ark program). Fauna recovery or threat abatement operations tend to be of much smaller scale and prioritised to those areas where foxes are threatening vulnerable populations.

Baits are often placed by hand, which in sensitive areas entails burial beneath a sand pad, thus allowing insights into the animals that visit each bait site. Poison baits are only laid after a period of free feeding, and only at those bait sites with no evidence of visitation by non-target animals. The need to lay baits by hand and check baiting sites periodically greatly increases the expense of deployment and reduces the areas that can be covered. Smaller baited areas are more susceptible to reinvasion by foxes.

Fox baits must be buried to a depth of 8-10 cm in Victoria. Placement along fence lines, ridges and tracks, with a bait spacing of 500-1000 m, is recommended in broad scale agricultural areas. Free feeding with monitoring of bait stations should precede baiting. The exercise should be repeated at weekly intervals if foxes are still being detected. Carcasses should be incinerated or buried. DSE promotes group control programs over several farms and adjoining public land to reduce the rates of reinvasion.

Wild dogs

Western Australia

In WA, most baits for wild dog control are prepared from kangaroo meat. Bait cubes (110 g fresh weight) are injected with a solution of 1080 (6 mg/bait) and sun-dried on racks to lose around 60% of their weight. Dried meat baits are more durable than fresh meat, and more difficult to eat for small native carnivores and other animals. Ground baiting is used in more accessible areas. Baits may be concealed, for example amongst leaves, to reduce non-target exposure. Aerial application aims to lay baits at watering points and along identifiable routes such as vehicle tracks, major pads, watercourses and gorges. Application rates are not specified but determined by local experience. Research is planned to examine baiting rates for wild dogs in WA. Baiting has traditionally occurred in autumn (breeding season) and spring (when pups begin to move about) but is now mainly restricted to spring and often deferred until later in the season when water becomes less available.

Queensland

Meat baits used for wild dog and fox control in Queensland are of two sizes, 125 g (containing 6 or 10 mg 1080) and 250 g (containing 6 mg 1080). Bait selection depends on location (higher loadings in western and far northern areas because of a perception that the lower dose is not effective), pest density and non-target risks (larger bait sizes where risks are identified). Baits are laid along transects on a 200-500 m spacing. The NRME Fact Sheet on wild dog control (PA10) notes that coordination of baiting programs across adjoining properties is essential to increase baiting effectiveness. Recolonising animals tend to be more likely to attack livestock than uncontrolled populations. Many graziers bait twice a year, to target adults during peaks in activity associated with breeding (April/May) and then again in August/September to target pups and juveniles.

Further detail on wild dog baiting in Queensland is contained in a recent referral (2003/966 received 21 February 2003) from the Queensland Parks and Wildlife Service (QPWS) under the Environment Protection and Biodiversity Conservation Act 1999. Standard dried red meat baits were to be laid at 500 m intervals in the Conondale Range complex (south of Gympie in SE Queensland) with aerial delivery in some remote locations where prior surveys had not detected the presence of quolls. Ground baiting would be used within 4 km of any locations where quolls had been detected since 1980, with baits buried and pre-feeding conducted, except in areas of unsuitable habitat such as pine plantations.

Where found to be present, quolls would be monitored by trapping and radio tracking during and after baiting. These methods would be used to investigate whether baiting may be beneficial to quoll populations in areas where continued wild dog activity necessitates further baiting. The QPWS notes that other large scale State government 1080 baiting operations generally occur outside the range where quolls have been found, and that habitat has been assessed as being of low suitability for quolls where baiting has occurred within the former range of these animals.

Victoria

In Victoria, wild dogs occur on public land in the alpine areas of Gippsland and the North East and have recently been reported in the western Mallee. Whilst wild dogs are not recognised as a threat to native fauna they can affect agricultural enterprises. 1080 Predator Baits (49354) each contain 4.5 mg 1080, and must be buried to a minimum depth of 8 cm. Wild dog or fox carcasses must be destroyed by incineration or buried, and reasonable steps should be taken to ensure similar treatment within 14 days of placement for untaken baits. 1080 baits cannot be used in urban and residential areas.

NSW

Lamb's tongues are a preferred baiting material for some NSW Rural Lands Protection Boards. They are said to be less likely to be taken by non-target animals because they are large, decay rapidly, and are easy to tether.

Northern Territory

Baiting in the Northern Territory uses fresh meat baits (200-500 g) injected on-site with 6 mg of 1080 in solution and laid by hand under vegetation close to watering points or along fence lines. Untaken baits are seldom recovered, unless placed in areas

frequented by the public. Aerial baiting is permitted but rarely used. Baiting is mainly restricted to large pastoral properties and conservation areas.

Long life baits

The commercial product (Doggone) is registered in NSW, Qld, Vic and SA. The usual rate of application, based on a dog density of up to 4/km², is about 1 bait per 10 ha. Baits should be buried at a depth of 8-10 cm at minimum 200 m intervals, after free-feeding, and replaced as needed. Neighbours are encouraged to participate in coordinated campaigns. Doggone baits should not be used where native marsupial carnivores are active, unless authorised by the relevant government authority.

Efficacy and specificity

A range of methods can be used for laying wild dog baits. Simple ground baiting entails distribution of baits along access tracks from the back of a vehicle, and differs little in reality from aerial baiting. Strategic ground baiting involves placement at sites selected to maximise their uptake by dogs and minimise non-target disturbance. Neither method is highly specific for dogs, and questions remain regarding their efficacy with research results indicating 20-50% reduction in dog numbers or signs. These methods are common on private land.

Replacement baiting involves monitoring of bait stations used in strategic ground baiting and replacement of taken baits. The need to revisit bait stations increases costs, particularly in rugged terrain.

Specificity can be further improved by burying baits, as many non-target species, particularly birds, are unlikely to remove buried baits. However, the method is not tested and does not offer the same margin of safety as mound baiting in respect of animals such as the spotted-tailed quoll.

Mound baiting offers further improvements and was believed to be the most target-specific method, but again increases costs because of the need to revisit bait stations periodically. Buried baits are covered with a mound of sand or raked soil to facilitate the identification of animals that visit the baits. Non-toxic baits are used initially, and followed up with toxic baits only at those locations where dog activity has been recorded. Although dogs that visit bait stations can be specifically targeted in this way, the effectiveness of this method in reducing indices of wild dog abundance and their impact on livestock on adjacent properties has not been scientifically assessed.

In contrast to the above, aerial baiting is generally regarded as an efficient and cost-effective dingo control technique, although success depends largely on the type of bait used and the age and social status of dingoes. The level of control may also depend on timing of baiting in relation to breeding season and seasonal changes in water distribution, leaching of toxin from baits by rain, availability of food, and the number and distribution of baits dropped. Thomson (1986) found that aerial baiting killed all of 18 radio-collared dingoes in one trial, and 62 and 63% in two others. Baits were dropped at high density (up to 50 baits/km) along major watercourses, roads and animal pads.

The New South Wales National Parks and Wildlife Service suspended the use of aerial baiting in Kosciusko National Park based on the recommendations of a species impact

statement (McIlroy, 1999) that raised serious issues about non-target species impact. Aerial baiting was approved by NSW in August 2004 for the Adaminaby and Yaouk areas in the north of Kosciusko National Park. State Forests has also discontinued aerial baiting as a general policy although some still occurs in the northern tablelands where it is integrated with RLPB operations.

The South Coast Rural Lands Protection Board is different from other areas of NSW in that helicopter baiting and simple ground baiting from vehicles are opposed, because it is not feasible to monitor which animals are taking the baits. In addition, toxic baits are only present on the ground for a short time after aerial delivery, while with mound baiting they can be present for up to 150 days per year. Aerial baiting was discontinued in the early 1990s when the replacement mound-baiting program, which continues to be updated, was found to be effective. However, this program may not be equally effective in other jurisdictions. For example, other RLPBs have noted that mound baiting can be compromised when pigs rapidly take baits from mounds, and that some areas are too rugged to allow regular access for mound baiting.

Whichever method is used, baiting for wild dogs is often followed up by trapping or shooting to remove wary or bait shy individuals. Effective wild dog control requires an integrated approach, as exemplified in NE Victoria where wild dogs have been effectively controlled in some areas but continue to cause significant stock losses in others. To achieve success, wild dog control programs need to be planned in advance and implemented year round using a strategic mix of control options such as trapping, baiting and fencing (North East Wild Dog Management Group, 2003).

Similarly, a recent evaluation of wild dog control in WA (WA, 2003) concluded that landholder complacency, a scaling down in the amount of ground control work carried out, and a gradual over-reliance on aerial baiting, have all contributed significantly to the progressive build-up of wild dog numbers in that jurisdiction. The evaluation concluded that medium to long term management of wild dog numbers in WA will require a move away from the present over-reliance on aerial baiting, with a return to the sustained and widespread deployment of all available control techniques in combination (ground baiting, aerial baiting, trapping and shooting). It is important to note that this evaluation continued to support aerial baiting. Its effectiveness can be difficult to reliably monitor and measure because of the general lack of good information on dog numbers, movements and livestock impacts.

It is noted that wild dog control in WA has relied on a single bait type, suggesting that an increase in the range of bait types available may help improve wild dog control.

Feral pigs

Feral pigs are found from western Victoria, through New South Wales into Queensland, and across northern Australia, from Cape York to the Kimberley region, and southwest WA. They are particularly found in association with wetlands and riparian ecosystems. Feral pigs appear to be increasing in number and range throughout the better-watered parts of WA, including forested areas in the southwest.

Fact Sheets on feral pig control issued by the Natural Resources, Mining and Energy department (Victoria) note that pigs are the major pest animal in the wet tropics, but that poison baiting is not the primary means of pig control because of the lack of a pig

specific bait material. Through the wise selection and presentation of bait material, landholders can be species selective in their poisoning program. Examples include use of bait material such as fermented grains (very attractive to pigs but not to other animals), burial of baits (feral pigs are one of the few animals that will dig up bait) and establishment of a free feeding routine so that pigs are the only animals feeding (they keep other animals away from the feeding site).

Western Australia

Pigs appear to be increasing in number and range in WA, and are known to damage production and conservation areas from the southwest jarrah forests to the northern river systems. Feral pig control in WA is expected to remain heavily reliant on 1080 baiting in the medium to long term, but the specificity of baiting practices needs to be improved.

NSW

The NSW NPWS considers baiting using grain laced with 1080 to be the most effective feral pig control option in habitats with dense canopy cover located away from urban areas, and has conducted many successful vehicle based baiting campaigns. In remote and rugged parts of the Blue Mountains area, free feeding is carried out aerially and NPWS staff are then transported by helicopter or horseback to bait hoppers in remote areas.

A Rural Lands Protection Board from central-western NSW reports that pigs can be selectively targeted by ensuring that they are regularly free-feeding before poison baits are laid. Laying of baits in the late afternoon and removal of any uneaten baits before sunrise minimises avian exposure.

Victoria

A 1080 bait (49352) is registered for feral pig baiting in Victoria, but its use is very limited and occurs only on public land.

Queensland

In Queensland, baits are tailored for local circumstances, with grain baits used where pigs are eating grain and meat baits where they are eating carrion or preying on livestock such as lambs. Baiting is predominantly conducted on an individual property basis, although there are occasional exceptions such as a regional coordinated program at Cunnamulla, organised by the local Land Protection Officer. Bait applications normally use bait stations, although baits may sometimes be laid along transects. Pre-feeding with a non-toxic bait improves bait uptake. All baiting is carried out under the guidance of an accredited and approved State or local government officer.

Meat baiting using 500 g baits injected with 72 mg 1080 remains one of the most efficient means of pig control in the more sparsely populated grazing areas of Qld, but is not used in other States. It is conducted on properties greater than 40 ha in size. Pre-feeding does not occur, but baits are laid in areas where pigs have been feeding on carcasses or carrion. Baiting occurs towards evening to minimise interference by birds, and only in amounts that the pigs will consume overnight.

Grain is soaked for at least 24 hours before bait preparation, and vegetable and fruit baits must be cut up. Baits contain high loadings (144 mg/kg in meat and 288 mg/kg in grain/vegetable/fruit).

Grain baiting is conducted after approval on properties larger than 5 ha by the relevant government officer. Prior soaking of the grain makes it softer and more palatable to pigs, and prevents bait storage by landholders. Baits are laid in trails or bait stations, after pre-feeding for 2-3 nights. The use of partially fermented sorghum, with addition of creosote to improve target selectivity, has been shown to increase bait attractiveness in the grain growing areas of the Darling Downs. Baiting with fruit and vegetables is conducted in similar fashion, but requires pre-feeding for up to 5 nights. Grain, fruit and vegetable baits are dyed green to deter interference by birds.

Ground baiting may be conducted using transects or bait stations. Meat baits are placed irregularly at bait points along tracks where there are signs of pig activity. When aerial baiting is needed, as in seasonally inaccessible areas on Cape York Peninsula, placement occurs along areas of recent pig activity. Several bait piles are placed at each bait station in order to allow feeding by several pigs rather than monopolisation by dominant animals.

In some cases where bait-taking by non-target animals needs to be reduced, bait stations may be used. These may be of several designs, but have the common purpose of excluding non-target animals such as livestock, macropods and birds while allowing access by feral pigs. Feeders are only opened at night. Once pigs enter the bait stations, they will chase off or exclude non-target animals.

Thus target selectivity is optimised by pre-feeding, bait placement where pigs are active, selection of bait substrates to match local pig preferences, dyeing of baits to deter birds, and partial fermentation of grains so that they are unattractive to non-target herbivores. All baiting requires prior approval and is subject to record keeping in relation to locations and timing of baiting and the types and amounts of bait used. Queensland government officers refuse to allow baiting in areas of environmental or public concern unless stringent risk management measures are in place, and certain sensitive locations may not be baited for feral pigs.

A catchment care group from coastal Queensland reports that feral pig populations increased greatly during 2001, with attendant damage to cane crops and semi-aquatic natural areas, but were successfully reduced to a few individuals by 1080 grain baiting. No non-target kills were seen. Poison baiting was preceded by a free-feeding campaign in which increasing amounts of grain were placed late in the evening at locations frequented by pigs. Once regular free feeding was established, green-dyed poisoned grain was laid in the same way, with left over grain cleaned up and destroyed.

Feral cats

Predation by feral cats is listed as a key threatening process under the Environment Protection and Biodiversity Conservation Act 1999. In Queensland, feral cats are now a declared species under new legislation, and a NRME fact sheet (PA26 dated June 2003) has been issued.

There was only one bait product for cats that is captured by this review, but its registration is not current.

4. ENVIRONMENTAL ASSESSMENT SUMMARY

4.1 Environmental exposure

Annual use of 1080 across Australia amounts to around 200 kg. Rabbit control (oat and carrot baits) uses the greatest amount, followed by wild dog control (meat baits). 1080 plays a key role in fox control and is also used against pigs and, in Tasmania, to control browsing native mammals.

General environmental exposure to 1080 is low as overall application rates are low (generally no more than a few grams per hectare) although use in baits leads to higher exposure in small areas where toxic doses are applied. While use of 1080 in this way does not lead to significant contamination of air, soil or water, its dispersal in bait form represents a potential hazard to non-target animals that may take the baits.

As a simple monovalent anion, fluoroacetate would be expected to be mobile in the environment and to be easily degraded. Various lines of evidence confirm these expectations. Studies of the environmental fate of fluoroacetate have confirmed that it is readily degraded in biologically active systems, such as soils, surface waters and living organisms.

Fluoroacetate occurs naturally in some plants, particularly in southwest Western Australia, but has a limited presence in soils and surface waters where these plants occur. The absence of fluoroacetate contamination in areas where it occurs naturally in plants is consistent with its ready degradation.

Studies with baits have shown that fluoroacetate is easily leached from some materials such as oats by rain or even dewfall. Other materials, such as carrots, are more resistant to leaching but quickly desiccate and become unpalatable under dry conditions. Meat baits are also detoxified by rainfall, and more so by blowfly larvae. If not taken, meat baits are likely to remain lethally toxic to dogs and foxes for up to 8 weeks, depending on rainfall and temperature, and may retain toxicity for up to a year under arid conditions.

The usual fate of fluoroacetate in baits is to be consumed by the target pests in the days or weeks following baiting. Prefeeding, which allows users to lay just enough toxic baits to ensure their rapid consumption, is normally conducted for herbivore and pig control (except in WA where a mixture of poisoned and non-poisoned grain is preferred for rabbit control). Similarly, use of bait stations where there are non-target concerns in relation to meat baits allows users to only lay poison baits where target animals are feeding. Such precautions are not always practicable, particularly in remote or rugged terrain where access is difficult. Predator baits may be applied from aircraft in such situations, or in regions such as southwest Western Australia or far western NSW where foxes need to be controlled over large areas and non-target risks have been assessed as low.

Most of the fluoroacetate ingested by animals is rapidly metabolised and/or excreted, with only low levels retained in the carcass. Early reports of relatively high residues in

rabbits, particularly in their livers and kidneys, are exaggerated as the analytical method made no allowance for the substantial defluorination of fluoroacetate that occurs in living animals. When analysed using a specific method, the highest residues in rabbits occur in blood, with very low residues in liver and kidney because of rapid enzymatic detoxification in these organs. Residues in rabbit carcasses remain below 1 mg/kg. Some animals retain higher residues, with up to 9 mg/kg measured in rat carcasses. Stomach contents may also retain high residues, in excess of 50 mg/kg for possums and ground squirrels following use in New Zealand and the US. Pig vomitus can therefore be expected to contain significant levels. High residues (up to 130 mg/kg) have been recorded in New Zealand invertebrates collected from baits.

Column leaching studies and groundwater monitoring downstream from a landfill confirm that 1080 is mobile in soil. However, use as baits presents minimal concerns with respect to leaching because of the low application rates and ease of degradation in biologically active systems.

Environmental effects

Fluoroacetate is itself not toxic. It is absorbed, activated and metabolized in the mitochondria of the cell to fluorocitrate by a process known as a “lethal synthesis”. It is fluorocitrate that is a potent inhibitor of the enzyme aconitase, a step in citric acid or Krebs cycle, which is the major energy producing pathway in the body. When this cycle is blocked the cell ceases to function through lack of energy and citrate accumulates in the tissues and plasma.

Symptoms usually begin to appear between 30 minutes and 3 hours after ingestion by warm-blooded animals, even when massive doses are used. This lag phase probably reflects translocation and cell penetration, conversion to fluorocitrate, and disruption of intracellular functions sufficient to induce gross symptoms. Herbivores generally die of cardiac failure, while carnivores experience central nervous system disturbances and convulsions before dying of respiratory failure. In omnivores, death tends to result from disorders of both the heart and central nervous system. Poisoned animals recover from sub-lethal doses as fluoroacetate is readily metabolised (for example by defluorination) and excreted.

Native species, particularly those from the southwest corner of WA that have existed in close association with fluoroacetate-bearing vegetation, tend to have greater tolerance to 1080 than their overseas counterparts. This developed tolerance is most pronounced in herbivores but is also present in omnivores and carnivores. Some unadapted Australian omnivores and carnivores (bandicoots and dasyurids) also appear to possess an innate tolerance to fluoroacetate when compared with their placental counterparts. This probably reflects the lower basal metabolic rate of the native species. Fluoroacetate is converted to fluorocitrate more slowly in animals with a lower metabolic rate, allowing greater detoxification and excretion to occur.

Extensive toxicity testing has been conducted in a broad range of native and introduced fauna, with much of this work reported in the published scientific literature. Many of these studies predate the development of modern regulatory test guidelines, but their results are generally consistent and considered reliable. The sensitivity of animals to 1080 poisoning can be divided into four broad categories. Highly sensitive organisms are defined as those with LD₅₀s below 2 mg/kg. Moderately sensitive organisms have

LD₅₀s between 2 and 10 mg/kg, while relatively tolerant organisms have LD₅₀s between 10 and 40 mg/kg. Organisms with LD₅₀s above 40 mg/kg can be considered tolerant.

When categorised in this way, all target animals are highly sensitive to 1080, as are sheep and native herbivores (possums, macropods and wombats). The LD₅₀ values in these animals are consistently below 1 mg/kg, with the exception of native animals from the southwest corner of WA that have developed a tolerance to the toxin. Some birds (red-browed firetail, crimson rosella and white-winged chough), rodents (plains mouse, bush rat, swamp rat and cane field rat) and dasyurids (stripe-faced dunnart, brown antechinus, spotted-tailed quoll and perhaps the eastern quoll) are also highly sensitive, although LD₅₀ values in these organisms are mostly above 1 mg/kg.

Most Australian birds are moderately sensitive to 1080, as are most dasyurids (except the ones named above), bandicoots and some rodents.

Some rodents (western chestnut mouse, sandy inland mouse, Mitchell's hopping mouse and Spinifex hopping mouse) are relatively tolerant of 1080. Native birds and mammals from the southwest corner of WA are relatively tolerant or tolerant of 1080. Ducks, raptors and doves from the eastern States are also relatively tolerant (but ducks from NW Australia are moderately sensitive). Emus, reptiles and frogs are relatively tolerant or tolerant of 1080.

Incident reports and field observations are consistent with the foregoing categorisation. Dogs are the most common non-target casualties reported, as may be expected given their sensitivity and broad diet. Foxes are also common non-target casualties of rabbit baiting. Among native mammals, unadapted wombats, macropods, possums and some rodents can be killed by herbivore baits. Some birds may also be killed by 1080 baiting. Scavenging species such as magpies and crows have been recorded as occasional casualties, together with some introduced species (sparrows, starlings, doves and pigeons). There are also anecdotal reports from the early 1990s of crimson rosella (a highly sensitive species) being killed by carrot baits laid for rabbits. Some insectivorous birds have been killed in New Zealand, although it is unclear whether small carrot bait fragments or insects that had fed on baits were the cause. Some insectivorous birds in North America are reported to have been killed when ground squirrels were baited with oat baits.

4.2 Environmental hazard

The potential risks of 1080 to aquatic organisms or to terrestrial organisms drinking from contaminated water in and around baited areas are minimal because of the low application rates needed for effective pest control.

Non-target birds and mammals are potentially at risk from 1080 baiting if they consume the baits (primary poisoning) or scavenge carcasses (secondary poisoning).

For primary poisoning, consideration of the sensitivities of non-target birds and mammals to 1080 indicates a potential risk to most birds and mammals if oat or pellet baits are consumed. Potential risk is highest for macropods and wombats. Some granivorous birds may also be poisoned, based on their sensitivity. The *One-shot 1080 Impregnated Oats* product (42501) used in WA presents a potential risk to most small birds and mammals if they consume a poisoned oat because of the high toxin loading of

4.5 mg. The potential risk is lower for carrot baits because they generally contain a lower concentration of 1080, but some species such as potoroos may be at higher risk from carrot baits because of dietary preferences.

With meat baits for canid control, spotted-tailed quolls are the non-target animal of principal concern because of their rarity, sensitivity and dietary preferences. Phascogales may also face a risk of poisoning from canid baits, but are probably less sensitive and are primarily arboreal feeders. Meat baits for pig control as used in Queensland are much more hazardous than canid baits because of the high toxin loading and represent a potential risk to many scavenging species, extending to raptors and probably goannas.

Secondary poisoning risks in general are relatively low because of the rapid metabolism of 1080 in living animals and the consequent low level of residues in tissues and organs. Secondary poisoning risks in Australia appear generally to be restricted to cats, dogs and foxes. Sensitive insectivorous birds also appear to be potentially susceptible to secondary poisoning if they consume insects that have fed on baits. Although earlier measurements of residues in rabbits indicated a potential secondary risk to some native animals, these findings are misleading because the analytical method used was non-specific and exaggerated the residues present.

Sensitivity is one factor that influences the likelihood that non-target animals will be poisoned during 1080 baiting operations. Other factors include frequency, scale, timing and intensity of baiting, materials used for baiting, methods of deployment, bait placement and the environment where baiting occurs.

The actual degree of impact in the field cannot be determined from the sensitivities of non-target animals but is lower than would be predicted on this basis alone. Bait uptake studies, carcass searching and radio tracking provide greater insight into the likely non-target impact of baiting. The ultimate measure is population monitoring, although interpretation of population changes can be difficult for highly mobile species, and population monitoring can be challenging for rare or cryptic species.

Observations of bait uptake indicate that a range of scavenging birds (currawongs, corvids, raptors) are likely to take meat baits under open field conditions, while some granivorous birds may feed on grain baits laid for herbivores. In forest situations, baits are more likely to be taken by mammals, such as bandicoots, rats, antechinus and quolls, with some interference by forest birds such as lyrebirds also recorded. Quolls have been shown to consume non-toxic meat baits in the laboratory and to interfere with meat baits at bait stations in the field, but the actual level of consumption appears to be relatively low.

Very few non-target carcasses have been recovered following 1080 baiting campaigns. Where radio tracking has been used to facilitate recovery, carcasses have been found in burrows or under cover rather than in open situations, and tend not to be found near water. Carcass recoveries indicate that a range of animals may be poisoned by 1080 baits under field conditions, although confirmatory residue analyses are usually not available. The most likely avian casualties based on carcass recovery appear to be introduced species such as sparrows, starlings and pigeons, scavengers such as currawongs, corvids and kookaburras, and occasional raptors in pig poisoning

campaigns. Among mammals, dogs are the most common non-target casualty; usually following consumption of meat baits or contaminated carcasses. Macropods, possums, wombats and rodents may be killed by grain or carrot baits.

Radio tracking has been particularly useful for measuring the response of quolls to baiting. Northern quolls and western quolls have been shown to be unaffected by baiting. Tiger quolls in NSW and Qld also appear to be unaffected by baiting for canids based on radio tracking, in contrast to earlier trapping studies that found significant population reductions following aerial wild dog baiting.

Population responses integrate the possible negative effects of poisoning with the benefits that accrue from removal of predatory and/or competitive species. A marked increase in native plant growth and return of associated bird life has been reported following rabbit baiting. In WA, the Western Shield fox-baiting program has allowed the recovery of various species including wallabies, bettongs, possums and numbats. Phascogales in WA appear to be unaffected by fox baiting. In western NSW, populations of rock wallabies and mallee fowl are increasing following successful fox control, while fox control in coastal regions has contributed to high fledging success in threatened shorebirds. Victorian baiting programs are beginning to return results, with favourable responses seen in bush-stone curlews, possums, dunnarts, phascogales, potoroos and bandicoots. Even for the target species in Tasmania, monitoring has shown no adverse effects on Tasmanian pademelon, Bennett's wallaby or brushtail possum populations. Wombats, eastern quolls and Tasmanian devils also maintain stable or increasing populations in the face of baiting. Isolated populations of bettongs can be impacted if baiting is carried out inappropriately in their habitat, as demonstrated in one incident in the mid-'90s. Similarly, adult rodent populations have been wiped out locally by 1080 baiting for rabbits, although juveniles quickly recolonised the area.

Effectiveness of 1080 in biodiversity conservation

Rabbits, feral pigs, foxes and wild dogs in Australia cause losses to agricultural production and cause environmental damage by removing native vegetation and/or preying on native animals.

Increase in native plant growth and return of associated bird life has been reported following rabbit baiting. In WA, the Western Shield fox-baiting program has allowed the recovery of various species including wallabies, bettongs, possums and numbats. Phascogales in WA appear to be unaffected by fox baiting. In western NSW, populations of rock wallabies and mallee fowl are increasing following successful fox control, while fox control in coastal regions has contributed to high fledging success in threatened shorebirds. Victorian baiting programs have noted positive effects on populations of bush-stone curlews, possums, dunnarts, phascogales, potoroos and bandicoots.

Impact of 1080 on non-target animals

The main concern with the use of 1080 is the risk of non-target poisoning from consumption of baits and, to a lesser extent, poisoned animals.

- There are differences in sensitivity to 1080 between different animal species. The review proposed to find that with careful attention to bait preparation, placement and timing, target selectivity could be optimised.
- Reliance on a single bait type can lead to bait shyness in target animals when baiting occurs for prolonged periods at moderate to high intensity. Bait shyness can result in non-target animals consuming the bait. The review proposes to find that a range of bait types should be available for each target pest, provided that non-target risks have been carefully evaluated for each bait type.
- The main concern with the baits used for rabbit control is the potential effect on granivorous birds, particularly sensitive species such as parrots and ducks. The review proposes to find that a preliminary free-feeding (feeding of non-poisoned baits) phase will assist in determining whether birds are likely to be attracted to poison baits. Bait stations are another option where significant avian exposure appears likely to occur. Baiting should occur late in the day, so that rabbits consume the baits overnight and minimise the amounts left available for birds. For carrot baits, it is important that baits be cut to a uniform size, avoiding small fragments and chaff that would contain proportionally more 1080 and may therefore lead to higher exposure of birds.
- Because of their dietary preferences, carrot baits are likely to be dangerous for potoroos, and the review proposes to find that they should not be laid in areas where the presence of these animals raises concerns.
- The tendency for rabbits to dehusk oats and eat only the kernel reduces the effectiveness and selectivity of oat baits. Non-target animals that consume the whole grain, including the husk, are likely to ingest more 1080 than the target pest. Furthermore, dehusking by rabbits can lead to sublethal dosing and resistance development. While the dehusking of oats by rabbits may reduce the efficacy of the baits, the review proposes to find that it is unlikely to present significant risks to non-target animals.
- In case of wallabies and possums, options for achieving target selectivity are much more limited, as a broad range of native fauna share their high sensitivity to 1080. The review proposes to find that target selectivity can be achieved by free-feeding to encourage consumption by target pests, the placement of baits away from bush edges where non-target animals such as bettongs are more likely to be active, and avoidance of baiting in or near their known habitat.
- For fox and wild dog control, burial of baits reduces non-target bait takes. However, spotted-tailed quolls, which are of particular concern, are known to dig up and consume baits occasionally. Aerial baiting using biomarkers indicates that a high proportion of resident quolls are likely to locate baits deployed at high rates by this unselective method, and trapping results indicate substantial reductions in tiger quoll populations after aerial wild dog baiting. This is a particular issue around Kosciusko National Park, with adjacent landholders calling for a restoration of aerial baiting within the park because of a perception that resident wild dog populations are increasing, with attendant stock losses. The review proposes to find that to minimise the risk to non-target animals, no more than two baits per kilometre should be laid in locations where carnivorous natives such as quolls are active.

- Foxes can readily become bait shy when exposure to baits occurs over extended periods. Sole reliance on a single bait form is inadvisable when baiting at higher intensities as some foxes are likely to develop an aversion to the baits, with a significant proportion of resident foxes likely to become bait shy in the longer term. Bait shyness may develop following sublethal exposures, which can readily occur when baits lose potency during field exposures. In order to maximise the efficiency of fox control, the review proposes to find that operators should consider switching bait types during a campaign, particularly where there is evidence that foxes are present but not taking baits. Non-target risks may be increased with different bait types, and this needs to be factored into bait campaigns where non-target exposures are of concern, for example in quoll or phascogale habitat.
- Similar principles apply to wild dog control, given that dogs are intelligent and wary animals and that shooting or trapping is often needed to control bait shy individuals. Possums in New Zealand have been shown to develop a bait shyness rather than a toxin shyness, and it is likely that dogs would respond similarly.
- Target selectivity with feral pigs is more difficult to achieve because of their large size and lower sensitivity to 1080 compared with other target pests. Grain baiting would appear generally to be the preferred method for baiting pigs, and the review proposes to find that prior establishment of regular free-feeding would seem essential. Where the main non-target concerns are for herbivores such as macropods, meat baits should be preferred. Baits should be laid late in the day and untaken baits should be recovered before birds begin to feed the next day. Use of fermented grain appears to improve target selectivity, but extra care is required when applying the water-soluble toxin to wet grain.
- Selectivity appears especially problematic with meat baits for pigs as they contain high loadings that are likely to be hazardous to birds of prey and goannas. Meat baits may be preferred in agricultural areas because they are more likely to be taken by pigs that have been preying on livestock, and are probably less likely to be eaten by goannas in such situations. However, the review proposes to find that they would still need to be covered to minimise uptake by birds of prey, or laid in the evening and recovered the next morning in order to avoid exposure of these diurnal feeders. Pig carcasses should be recovered to the extent possible, and burned or buried to minimise secondary exposures.

5. LABEL INSTRUCTIONS FOR 1080 PRODUCTS

Current 1080 product labels do not contain adequate information and instructions for use. Historically much of the supporting information for 1080 use has been provided by state departments of agriculture. Specific directions for use are often contained in a variety of documents issued by individual departments.

These include regulations, codes of practices, manuals or standard operating procedures. In general, it is acceptable for the labels to be accompanied by leaflets or refer to authoritative State documents, so long as they contain risk mitigation measures to address the requirements stipulated by the Agvet Codes. Under section 14 the Agvet Codes, the labels need to contain instructions such as the circumstances in which the product should be used, how the product should be used, the frequency of the use of the

product, the safe handling of the product and any other matters prescribed by the regulations. The review proposes to find that most current 1080 labels do not meet these requirements.

The review proposes that common principles for 1080 use must be included on all labels. Where there are different information requirements, specific to different ecosystems, then that information may be more appropriately included in extension material. However, it is proposed that it be a condition of registration that the information provided in supporting material (eg Code of Practice for the Use of 1080) must not be changed without prior endorsement of the APVMA to ensure they do not negate the necessary risk mitigation measures, or the labelling requirements stipulated by the Agvet Codes.

Some labels specify ‘vermin’ as the target pest. However, ‘vermin’ is not defined. The review proposes that labels must specify target species.

5.1 Grain and vegetable baits

Baits used for rabbit control are likely to be toxic to a range of non-target native birds and mammals. Even in southwest WA, the main rabbit bait used is likely to be toxic to many birds and small to medium native mammals because of the high loading of 4.5 mg 1080 on individual poisoned oat groats. There is some recognition of this risk on current labels, which may advise users to place baits in locations that are inaccessible to non-target animals or to time baiting for when non-target species are not active. These warnings could be better expressed as the following specific instruction: “This product is toxic to birds and other wildlife. Baits should not be laid at times when or in locations where they are likely to be consumed by birds or non-target wildlife. Baiting should occur late in the day to minimise exposure of birds”. Similar restraints are appropriate for feral pig baits based on grain, fruit or vegetables.

The carrot baits used in Tasmania for control of native herbivores present similar hazards. Current labels do not specify the target species, and do not include a restraint with particular reference to bettongs and potoroos.

The baits for herbivore pests, and grain and vegetable baits for feral pigs should continue to be dyed blue or green to minimise uptake by birds.

As the secondary poisoning risk to native species scavenging pig, rabbit (and native herbivore) carcasses appears relatively low, there is no need from the perspective of biodiversity conservation for a label requirement that carcasses be collected. However, such a label requirement would help reduce risks to domestic dogs and avoid attracting scavenging feral species.

5.2 Meat baits

Labels of 1080 products used for fox and wild dog control advise users to bury them to a depth of 8-10 cm, particularly if they are likely to be taken by non-target animals, but burial does not appear to be a legal requirement. Although burial should generally be preferred, to make this a legal requirement would be impractical and counterproductive, given recent research indicating that some kinds of fox baits need not be buried in quoll habitat, and that to require this would reduce the efficiency of baiting.

The meat baits used for canid control are likely to be toxic to native carnivores such as quolls, particularly if more than one bait is taken. The review proposes to find that all labels should therefore contain the following instruction: “This product is toxic to carnivorous native mammals. Do NOT exceed 2 baits per km in locations where carnivorous native mammals are active”.

As baits lose toxicity in the field, baits that are not recovered at the end of a campaign may deliver a sublethal dose to foxes, which in turn can select for bait shyness in fox populations. Development of bait shyness in fox populations has adverse consequences for biodiversity conservation. The review proposes to find that labels should therefore advise users to mark bait stations to facilitate the recovery of baits and their destruction by burning or burial according to State requirements at the end of a campaign.

The meat baits for feral pig control contain higher loadings than the canid baits and are likely to be toxic to carnivorous native mammals, birds of prey and goannas. As for the canid baits, burial is impractical, particularly when baiting in inaccessible areas such as Cape York Peninsula where aerial deployment is the only option. The review proposes to find that labels should carry the following instruction: “This product is toxic to carnivorous native mammals, birds of prey and goannas. Baits should not be laid at times when or in locations where they are likely to be consumed by birds or non-target wildlife. Baits should be placed late in the day and where possible recovered early the next morning to minimise exposure of birds and reptiles”.

5.3 Instructions related to human and domestic animal safety

The users of products containing 1080 are required to notify their neighbours of the impending 1080 baiting, erect warning signs and potential dangers to domestic dogs. The review proposes to find that product labels should contain specific instruction on neighbour notification and display of warning signs.

5.4 Proposed findings

The review proposes to find that labels for 1080 products do not contain adequate instructions to ensure the safe use of the products. The proposed Preliminary Review Findings are that common principles must be included on labels. Where there are different information requirements, specific to different ecosystems, then that information may be more appropriately included in extension material.

However, it is proposed that it be a condition of registration that the information provided in supporting material (eg Code of Practice for the Use of 1080) must not be changed without the prior notification of the APVMA.

The proposed review findings are that label instructions can be varied to contain adequate instructions so that the products can be used without undue risk. The product labels need to be updated to reflect current specifications and standards. The changes to be made to labels include the following:

- delete general terminology ‘vermin’ and replace with specific target animals;
- neighbour notification about imminent baiting;
- minimum distance requirements for bait placement;
- requirement of signage in baiting locations;
- 1080 dose rates;

- bait materials and size;
- bait preparation; and
- storage and transportation of baits.

6. CONCLUSIONS

In summary, the review proposes to find that the available evidence indicates that use of 1080 in Australia does not give rise to widespread or serious impacts on non-target fauna, although many species are sensitive to the toxin. Correct bait placement, or laying baits in the right place at the right time, is essential if non-target impacts are to be avoided. Baits should preferably be laid in the evening in order to minimise interference by birds, after preliminary free feeding to ensure that target animals will quickly consume the poison baits. Baiting should generally be avoided in and around important native habitat as herbivore baits in particular can exert severe impacts on sensitive local populations, as exemplified by local extinctions of bettongs and rodents. Similarly, meat baits need to be placed with great care in spotted-tailed quoll habitat as these animals are sensitive to 1080 and may be negatively impacted by poisoning, although successful fox control is likely to benefit their populations in the longer term.

Baiting practices vary across Australia and even within States because of differing environmental conditions and sensitivities. This makes it difficult to standardise labels for 1080 products. Nevertheless, current labels contain limited information regarding the minimisation of non-target risks. The review proposes to find that labels need to be varied to provide clear advice on optimal baiting practices to suit local environmental requirements.

7. SUMMARY OF THE PRELIMINARY REVIEW FINDINGS

7.1 Environmental contamination

- Application rates of 1080 are low, a few grams per hectare for herbivore control and a gram or less for carnivore control. Although the application rates for feral pigs are higher than those for other vertebrates, they are still low. As such, significant contamination of air, soil or water by 1080 is not expected to occur from these uses as the toxin is susceptible to microbial degradation, except under arid conditions when microbial activity is low.
- The ready microbial degradation of 1080 under moist conditions conducive to microbial activity, and the low treatment rates mean that significant leaching is not expected to occur.
- Low level 1080 contamination of water is possible, particularly if baits fall directly into watercourses, but any contamination that may occur will be at low levels and rapidly diluted to insignificant concentrations.

7.2 Poisoning of non-target animals

- The main concern with the use of 1080 is the risk of non-target poisoning from consumption of baits and, to a lesser extent, poisoned animals.

- There are differences in sensitivity to 1080 between different animal species. With careful attention to bait preparation, placement and timing, target selectivity can be optimised.
- Reliance on a single bait type can lead to bait shyness in target animals when baiting occurs for prolonged periods at moderate to high intensity. Bait shyness can result in non-target animals consuming the bait. A range of bait types should be available for each target pest, provided that non-target risks have been carefully evaluated for each bait type.

7.3 Label instructions

- The labels for 1080 products do not contain adequate instructions to ensure the safe use of the products. However, the label instructions can be varied to contain adequate instructions so that the products can be used without undue risk. The product labels need to be updated to reflect current specifications and standards.

8. PROPOSED REVIEW RECOMMENDATIONS

Taking into consideration the information provided for this review, the following recommendations have been developed in relation to the continued use and availability of 1080 products in Australia.

8.1 Label Variations

In addition to the labelling requirements as defined in the Agvet labelling code, the following instructions must also be included:

Aqueous solutions

These products must carry instructions in relation to bait preparation and must include information on who can prepare baits, bait materials, concentration of 1080 in baits, safety directions and all the related State manuals and legislation.

All formulations

NOT TO BE USED FOR ANY PURPOSE, OR IN ANY MANNER, CONTRARY TO THIS LABEL UNLESS AUTHORISED BY APPROPRIATE LEGISLATION.

RESTRICTED CHEMICAL PRODUCTS – ONLY TO BE SUPPLIED TO OR USED BY AN AUTHORISED PERSON

Short-life and shelf-stable baits

Neighbour notification

Timely notification of adjoining neighbours is essential to allow them to take any actions deemed necessary in the circumstances. This may include an appeal against the laying of poisoned baits, moving stock from adjacent areas, and restraining or muzzling dogs. The labels must include the following instructions:

Neighbours must be notified to allow them to take appropriate action. This notification must be in writing and must be given to all adjoining landholders at least 72 hours in advance except where alternative arrangements (e.g. individual multi baiting letters and/or media notice) are necessary due to large scale projects and the impracticality of individual advice, but where overall safety criteria are met.

A record of the notifications must be kept.

Baiting should commence within seven days of notification or else another three days notice of intent to lay baits is required.

Signage

Signage in the area where 1080 baits have been laid is necessary to inform people using or entering the land of the potential risk. As this risk to domestic dogs in particular will continue, signs should be maintained for a period post poisoning. The following instructions must be included on the label:

Signage is compulsory for all lands where baiting occurs.

Signage must include – date baits laid, contact numbers, toxin name, target animal(s) and a warning that non-target animals can be affected.

The landholder must put up notices immediately before 1080 poisoning operations start on the property.

These notices must remain up for at least 4 weeks, and must be placed:

At every entry to the property;

At the entrance to the actual poisoning site;

At the extremities of the property boundaries where the property fronts a public thoroughfare.

Storage and transportation of baits

Baits should be stored and transported in a secure and safe manner and access to baits should be restricted to approved personnel. Storage of baits by landholders, other than manufactured baits, is not recommended. All the labels must contain the following instructions.

Only authorised personnel can have access to baits. Baits must be transported and stored in such a way that unauthorised personnel cannot have access to baits.

End-users must not store baits.

Do not place the bait in a position accessible to children, livestock or domestic pets.

Do not feed baits to wild or domestic birds.

Do not apply baits to, or in, crops.

Do not allow baits to contaminate foodstuffs, or feed, for human or non-target animal consumption.

Containers which have held product are not to be used for any other purpose and must be disposed of by burning or deep burial.

Do not contaminate dams, rivers, streams, waterways or drains with the product or used containers.

The pesticide is only to be kept or stored in the container, and bearing the label, as supplied the manufacturer

Distance restrictions

The minimum distance 1080 baits can be laid from residences, watercourses, boundary fences and roadways will depend on the relative risk to residents, the general public and domestic animals. All labels must carry the following instruction.

Baits must be placed at least 150 m from a dwelling; 20 m from watercourses and water bodies; 5 m from boundary fences; and 5 m from the edge of formed public roadways.

Protection of domestic and farm dogs

The following instruction must be included for the protection of domestic and farm dogs.

It is advisable to tie up or muzzle dogs during 1080 baiting programs to avoid accidental poisoning.

Bait and carcass recovery

As baits lose toxicity in the field, baits that are not recovered at the end of a campaign may deliver a sublethal dose, which in turn can select for bait shyness in pest populations. Development of bait shyness can have adverse consequences for biodiversity conservation, particularly in fox control where a single fox can do considerable damage. Labels for all 1080 products must contain the following instructions:

To the extent possible, untaken baits must be recovered at the end of a baiting campaign and be destroyed by burning or burial according to the requirements of the State or Territory in which use has occurred.

Although the secondary poisoning hazard of 1080 for native species appears low, carcasses can remain toxic to domestic dogs, and may attract feral scavengers to baited areas if not recovered. Labels for all 1080 products must contain the following instructions:

To the extent possible, animal carcasses must be recovered during and for 14 days after a baiting campaign and be destroyed by burning or burial according to the requirements of the State or Territory in which use has occurred.

Any incidents where it is suspected that non-target animals may have been poisoned by 1080 be notified to State authorities.

Baits used for herbivore pest control

To reduce the potential for harm to non-target wildlife, labels for rabbit bait products (42499, 42450, 42501, 49350, 49351, 49352, 50304 and 52954) must include the following instructions:

This product is toxic to birds and other wildlife. Baits should not be laid at times when or in locations where they are likely to be consumed by birds or non-target wildlife. Baiting should occur late in the day to minimise exposure of birds.

The carrot baits used in Tasmania for control of rabbits and native herbivores present similar hazards. The label for this product (42458) is inadequate in respect of the circumstances in which it may be used. The label should specify target species. To reduce the potential for harm to non-target wildlife, the label must also include the following instructions:

This product is toxic to birds and other non-target wildlife, particularly marsupial herbivores such as bettongs and potoroos. Do NOT lay baits in areas likely to contain isolated populations of bettongs or potoroos. Bait should not be laid at times when or in locations where they are likely to be consumed by birds or non-target wildlife. Baiting should occur late in the day to minimise exposure of birds.

Baits used for fox and wild dog control must contain the following

The meat baits used for canid control are likely to be toxic to native carnivores such as quolls, particularly if more than one bait is taken. The labels for these products (42498, 42500, 42538, 42720, 46434, 49354, 49355, 49384, 50911 and 54616) must contain the following instructions:

This product is toxic to carnivorous native mammals. Do NOT exceed 2 baits per km in locations where carnivorous native mammals are active.

Non-meat used for feral pig control

The labels for non-meat feral pig bait products (42499, 49352) must include the following instructions:

This product is toxic to birds and other wildlife. Baits should be laid late in the day and recovered the next morning. Baits should be buried where possible to restrict non-target access. Baiting for pigs should always be preceded by free feeding to maximise target specificity.

8.2 Proposed Conditions of Registration

It is proposed that the APVMA not be satisfied that the continued registration of 1080 products in accordance with their instructions for use would not be likely to have an unintended effect that is harmful to animals, plants or things or to the environment.

It is proposed that the APVMA can be satisfied of the continued registration of 1080 products if conditions of registration are varied as follows:

[Registrant] must make the [State] Code of Practice for the Use of 1080 version xxxx available on its website.

[Registrant] must make hard copies of the Code or Practice available at point of supply.

[Registrant] must not supply or make available on its website a copy of the [State] Code of Practice for the Use of 1080 in the form other than that specified in these conditions unless [State registrant] has notified the APVMA of any changes to the new form.

8.3 Proposed Regulatory Actions

As an outcome of the review evaluations it is proposed that for 1080:

1. All product labels be varied as discussed in section 8.1.
2. Registration will be varied to impose new conditions as discussed in section 8.2.
3. All product registrations under consideration, as listed in Table 1 be affirmed.

9. PUBLIC INTEREST IN THE REVIEW

Before formally initiating the 1080 review, the APVMA investigated the issues associated with the use of 1080 to define the scope of the review and to establish the data requirements to ensure the efficiency and effectiveness of the review process. In order to do this, in December 2001 the APVMA announced (APVMA Gazette and a media release) its intention to review the chemical 1080 in 2002 and sought information from product registrants, users, industry groups and interested parties on chemical application, accidental poisonings and possible measures to minimise these risks.

Approximately 250 submissions were received from local, state and federal government agencies, environmental organisations and conservation groups, rural lands protection boards, animal welfare groups, industry organisations, community groups, landholders, media groups, and the general public. The nature of the submissions varied from short testimonials through to comprehensive data packages addressing all aspects associated with the use of the chemical. A number of these submissions included copies of key papers relevant to the use of 1080 in Australia, as well as research directions already being planned and implemented. Below is a summary of the submissions.

- 1080 is a naturally occurring compound that does not persist in the environment nor accumulate in wildlife. Its availability and use are tightly controlled by State authorities. Differences in sensitivity (carnivores and especially canids most sensitive, native species more tolerant than introduced) and feeding preferences

allow target selectivity, while greater tolerance in WA makes target selectivity easier to achieve. There are biodiversity conservation benefits from the use of 1080, such as successful fauna reintroductions in WA and elsewhere in Australia.

- Use of 1080 to control browsing mammals in Tasmania exerts a temporary “knock-down” effect on target animals and sometimes kills a few non-target animals, but spotlight surveys indicate that baiting is not reducing populations of target or non-target animals. 1080 is an essential tool for forestry plantation establishment in Tasmania, although not the complete answer.
- More broadly, 1080 is a vital tool for agriculture that also protects flora and fauna; its removal or restriction would lead to increased use of illegal alternatives which are more damaging to the environment, and to increased predation and competition for native animal populations.
- Coordinated area campaigns are most effective for canid control, but may be difficult to achieve in some areas due to opposition by some landholders, mainly because of concerns for dogs. 1080 is known to kill domestic dogs, but many respondents consider that dogs should be under closer supervision. Rare species such as quolls are also sensitive but continue to be seen in previously baited areas, sometimes after not being sighted for many years.
- Agricultural interests expressed a view that the review should focus on labelling and related control of use aspects, and analysis of alternatives with a focus on efficacy.
- A number of respondents while recognising the benefits of 1080 considered that some aspects of its use needed to be further explored or refined.
- The issue of bait uptake was a prominent theme. Further research is needed into bait movement, including caching of baits by foxes, as this may increase non-target risks. The lower palatability and consequent increased rate of caching for commercial baits was identified as a potential shortcoming. There is a general need for specific data on bait uptake by target and non-target species.
- Evidence that 1080 impacts on quolls was presented, and the following issues were identified: bait specificity (whether dried meat baits are less attractive to quolls), mound baiting (optimal depth for bait burial and independent auditing) and possible secondary poisoning during rabbit baiting operations. It was argued that aerial baiting should not occur in quoll habitat as the impact is likely to be significant and could be a major factor in the ongoing decline of mainland species. It was noted that aerial baiting has ceased in Kosciusko National Park because of these concerns, but that adjacent landholders don’t believe that the current ground baiting operation is as effective, even though this occurs throughout the year whereas the former aerial operations were conducted annually. Further research is underway to try and resolve this issue.
- A number of respondents argued that the humaneness of 1080 is a crucial aspect that must be addressed. Research into alternative methods, such as use of the prolactin inhibitor cabergoline or the M44 ejector, was highlighted.

- A minority of respondents to the review were concerned about the use of 1080, with some favouring a ban or tighter restrictions. Issues raised included that distribution to landholders should be banned because of risks to dogs. Some contended that 1080 should be banned completely because of impacts on native fauna. These views were more prevalent in Tasmania, where many people are opposed to the use of 1080 to control native fauna, particularly during the establishment of forestry plantations. Decisions should be based on the precautionary principle.

10. OVERSEAS REGULATORY STATUS

Development and use of 1080 as a predicide and rodenticide occurred in the US in the 1940s, but all registrations were cancelled in 1972 together with those for other predator control agents containing strychnine and sodium cyanide. Registration of livestock protection collars was restored in 1985 and remains the only approved use in the US.

1080 is also used in Mexico and Israel, but the bulk of world usage occurs in New Zealand and, to a lesser extent, Australia. 1080 has been registered in New Zealand since 1964. It has not been assessed since this time and all other registrations have referenced the original data. New Zealand authorities are currently in the process of reviewing all aspects of the registration of 1080.

11. THE VERTEBRATE PEST COMMITTEE

The Vertebrate Pests Committee (VPC) is a sub-committee under the Land and Water Biodiversity Committee, which advises the Natural Resources Management Standing Committee of the National Resources Management Ministerial Council, chaired jointly by Commonwealth Ministers for Agriculture, Fisheries and Forestry, and Environment and Heritage. The VPC called for a review of the policies, practices and procedures for the use of 1080 (sodium monofluoroacetate) within Australia and New Zealand. The review was conducted by a Working Group of VPC, which was made up of representatives from across Australia with expertise in vertebrate pest control.

The objectives of the working group were to conduct a review of a number of recent documents available on 1080 and to produce consistent recommendations on the use of 1080 across Australia. It also reviewed existing legislation relevant to both how 1080 is used and controlled and to other associated issues involved in pesticide use. This review was to also consider the public perception of 1080.

The terms of reference for the review were:

1. Document and review the current information, policies, practices and procedures for the use of 1080 in Australia and New Zealand.
2. Evaluate the role and importance of 1080 in vertebrate pest management in Australia and New Zealand.
3. Recommend policies, practices and procedures necessary to ensure the future availability and effectiveness of 1080 in Australia and New Zealand.

Two of the key objectives of this review were to provide information on the role that 1080 plays in vertebrate pest control in Australia and New Zealand and to highlight areas where improvements can be made in its use to. These improvements will not only allow for more efficient, safe and economical use to be made of 1080 as a vertebrate

pesticide, but will also provide balanced information to parties interested in the general issue of the use of 1080.

11.1 Vertebrate Pest Committee's Recommendations

The following recommendations (unpublished to date; a copy was kindly provided to the APVMA for the purpose of the review) were developed by the VPC. It has to be recognised that there are inherent differences in target species, circumstances, local native fauna, legislation and landholder expectations across the various jurisdictions making the feasibility of national standards difficult but where possible this would be preferred.

1. Neighbours should be notified in writing of an impending 1080 baiting program in sufficient time to allow them to take appropriate action. In general, this notification should be in writing and should be given to all adjoining landholders at least 72 hours in advance.
2. The minimum distance for bait laying should be 150m from a dwelling, 20m from specified watercourses, 5m from boundary fences and at least 5m from formed public roadways.
3. Signage should be compulsory for all lands where baiting occurs and should remain for a minimum period of 28 days after baiting.
4. As a general principal a single bait should contain sufficient toxin to be lethal to a target animal. Specific recommendations of dose rates for target species are recommended.
5. Bait size, placement, 1080 concentration and delivery should take into account target species' behaviour and the presence, behaviour and susceptibility of non-target species. A range of bait materials is recommended for various species.
6. Techniques used should maximise the probability of control of target species while minimising effects on non-target species. In particular, techniques should maximise the delivery of baits of a consistent quality and standard. Some modifications to current practices are recommended.
7. Baits should be stored and transported in a secure and safe manner, and access to baits should be restricted to approved personnel.
8. As there is a need to control native species in some circumstances, current practices need to continue. As a priority however, there is a need to develop alternative control techniques to 1080.
9. General recommendations:
 - a) Each State and Territory should adopt and resource a Quality Assurance approach to 1080 usage.
 - b) There should be development of a 1080 information kit that outlines facts concerning 1080 and which has a consistent message across agencies and States and Territories.
 - c) The existing data in relation to 1080 dose rates used throughout Australia and New Zealand should be reviewed by the States in line with the principles outlined in this document.
 - d) The research requirements detailed in Appendix 2 of the VPC report be considered as high priority for continued and improved use of 1080.

11.2 Vertebrate Pest Committee's Conclusions

VPC recognises the need for appropriate restrictions on the use of 1080 to protect the environment and human health. The committee asked that the APVMA take account not only of the need to manage the risks associated with 1080 use, but also of the broader outcomes that would follow any removal or excessive restriction on 1080 use. These would include a substantial reduction in the effectiveness of vertebrate pest control with correspondingly adverse impacts on agriculture, trade (in the event of an exotic disease outbreak) and the environment (including survival of threatened species).

11.3 VPC's work in the context of APVMA's review

The APVMA wishes to highlight the importance of the work of the VPC in investigating the issues associated with the use of 1080 in Australia and New Zealand.

The APVMA has utilised the information contained in this report, particularly with reference to the summary of use practices across Australia, in conjunction with new advice presented for the review from registrants and States authorities that deal with 1080.

The recommendations from the VPC have not merely been adopted without any consideration. Where recommendations have been utilised from this report the APVMA has carefully considered the implications of such action particularly in relation to whether those recommendations can be enforced either by the APVMA or by the relevant State authorities who control the use of chemicals.

12. OTHER MATTERS NOTED AS PART OF THE REVIEW

The review noted a number of matters that are related to the continuing use of 1080, but have no directed bearing on the reconsideration process. These include alternative non-chemical vertebrate pest control options, government initiatives regarding 1080 use in Tasmania, literature and public submissions on the humaneness of 1080, government initiatives in relation to animal welfare as well as proposals for the regulatory framework for the supply of 1080 concentrate and baits.

Alternatives to 1080

Several other vertebrate pest control techniques- such as fencing, shooting and trapping, tree guards in plantations, repellents, are available as non-chemical alternatives to 1080.

DEH has examined the currently available information submitted to the review on vertebrate pest control techniques. Fences need to be of high quality if vertebrate pests are not to breach them, particularly in rugged and rocky country. Shooting is often used in conjunction with 1080, particularly for control of remnant populations after baiting, but is generally ineffective when used in isolation, particularly where vegetation and/or terrain reduce visibility. Trapping is useful for some species such as possums and dogs but generally needs to be combined with other methods. Shooting and trapping also need to be repeated regularly to be effective. Repellents only seem to be effective when browsing pressure is low, and even then do not protect new foliage.

Guard dogs (and llamas) are used on some properties to protect sheep against attack by foxes and wild dogs. Warren ripping is an important part of rabbit control.

Some of these alternative options are often included in vertebrate pest control programs. It is important that all the vertebrate pest control programs thoroughly consider all the available control options.

12.1 Humaneness of 1080

From public submissions during the nomination and the review scope stages, it was evident that there was strong public concern about the humaneness of using 1080, and that the community considered that this issue should be considered by the review. Although the APVMA notes these concerns about animal humaneness, animal welfare is not a specific criterion in the Agvet Codes that can be taken into account in determining the regulatory outcomes of the review. Animal welfare, in relation to the use of pesticides, is a broader government policy matter that is beyond the responsibilities of the APVMA.

The literature and public submissions relating to the use of 1080 and animal welfare are summarised in the following paragraphs. However, the review has not drawn any conclusions from this literature, as humaneness of a pesticide is not a specific criterion under the Agvet Codes.

In herbivores, poor cardiac performance and ventricular fibrillation induce cerebral anoxia and rapid loss of consciousness. The loss of electrical activity within the cortex leads rapidly to clonic muscular convulsions. One research report suggested that the convulsions seen in herbivores, and associated vocalisations, occur while the animal is unconscious and feels no pain.

With central nervous system disturbances, which are the usual response to poisoning in carnivores, it was suggested in the literature that the observed symptoms are similar to epileptic seizures as electroencephalographs of poisoned dogs display identical cerebral dysrhythmias. It was reported that dogs are believed to become unaware of their predicament and surroundings, similar to the loss of awareness that occurs in humans suffering epileptic seizures.

1080 poisoning has also been compared with hyperinsulinism, as both states reflect a depletion of energy in cells. Hyperinsulinism leads to mental disorientation, convulsions and loss of consciousness. Central nervous system stimulation in 1080 poisoned dogs has been shown to occur under anaesthesia. In case of 1080 poisoning in captive foxes, the average time for appearance of symptoms is a little over 4 hours, with an average time to death of 5.45 hours. There appear to be two distinct phases of activity, separated by a 10-40 minute period of minimal activity. The first period typically begins with retching while the fox is ambulatory. This is frequently followed by collapse, paddling with the feet or sudden tetanic spasms.

Although the measurement of pain in animals must always be a subjective exercise, some insight into the degree of suffering experienced by 1080 poisoned animals can be obtained from humans that have been poisoned in this way. Symptoms in humans involve central nervous system stimulation with clinical signs of anxiety, agitation, nausea and generalised tonic-clonic convulsions, but pain is usually not reported. In one example, a man poisoned during mixing of 1080 powder reported tingling sensations around the mouth and nasal passages, extending to the arms and legs.

However, there was no recollection of pain during the spasmodic contractions of voluntary muscles that occurred in the 2.5 hours before unconsciousness intervened.

Research has been conducted into the use of analgesics and sedatives in 1080 baits, in the interest of animal welfare. Baits containing an analgesic in combination with 1080 are currently being used at two Victorian field sites.

12.2 Government initiatives regarding the use of 1080 in Tasmania

In Tasmania, control of native herbivores is considered essential for the protection of horticultural crops and newly planted forestry plantations. Broad scale population monitoring conducted hitherto indicates that target and non-target herbivore populations are stable. The review proposes to find that the use of 1080 to control browsing native mammals in Tasmania exerts only a temporary “knock-down” effect on target animals and that it does not lead to reductions at population level.

The APVMA notes that the Tasmania government has already commenced phasing out the use of 1080 through the programme known as *Tasmania Together*, one of the goals being the reduced reliance on chemicals. 1080 was targeted as a chemical whose use would cease in Tasmania by 2015.

Tasmania Together is a community owned 20 year Social, Environmental and Economic Plan that was launched in September 2001 following an extensive public consultation phase. It contains 212 benchmarks grouped under 24 goals, the last of which is to “ensure our natural resources are managed in a sustainable way now and for future generations”. This goal encompasses a range of standards, including to “reduce reliance on chemical use by primary, secondary and tertiary industry and the domestic sector”. Usage of 1080 has been selected as an interim indicator, and is to show a reduction of 50% from 1999/2000 levels (around 15 kg/annum) by 2005 and 75% by 2010 with cessation of use by 2015. The following rationale is provided:

“The continued use of 1080 is not acceptable. However, time is needed to develop viable alternatives to 1080 and phase it out in a non-disruptive way. In choosing the level of use of 1080 as an indicator against this standard, the benchmarking committee did not consider it the most relevant, but one for which data was readily available”.

In a recent announcement, the Tasmanian Premier Paul Lennon (September 2004) indicated that there had been many calls for the State Government to ban 1080, used to control browsing animals in forestry plantations. Although there has been significant progress to reduce the amount of 1080 used in Tasmania (the *Tasmania Together* target for 2005 of 7.6kg (of 1080) has been bettered 12 months early), 1080 would be phased out, and its use eventually banned completely in state forests by December 2005.

The APVMA also notes that the Australian Government made statements during the 2004 election campaign that it would provide assistance in phasing out the use of 1080 in Tasmania. In May 2005, the Prime Minister reiterated the Government’s commitment while announcing the agreement between the Australian and Tasmanian Governments that builds on the Tasmanian Regional Forest Agreement. His announcement stated “Use of 1080 on public land will be banned from the end of 2005. Australian Government funds will be used to fast-track development of alternatives to its use on private land”.

These initiatives are not inconsistent with the review outcomes possible under the Agvet Codes. However, the regulatory measures proposed by the APVMA in this review are based on the independent scientific evaluation conducted by the Department of the Environment and Heritage, in accordance with the Agvet Codes. The APVMA cannot consider the Tasmanian and Commonwealth government initiatives in determining its findings.

12.3 Government initiatives in relation to animal welfare

The National Consultative Committee on Animal Welfare

The National Consultative Committee on Animal Welfare (NCCAW) is a non-statutory body that advises the Federal Government on the national implications of welfare issues affecting animals.

This Committee was established in 1989 by the then Minister for Primary Industries and Energy. The Committee consists of representatives from the Australian Government Department of Agriculture, Fisheries and Forestry, Department of the Environment and Heritage, National Health and Medical Research Council, National Farmers' Federation, Australian Veterinary Association, RSPCA Australia, Animals Australia, a representative from each State/Territory government (drawn from State Animal Welfare Advisory Councils/Committees where they presently exist), and Animal Health Australia.

One of the functions of NCCAW is to assess and advise the Federal Government on the national implications of welfare issues affecting animals. It also advises on the effectiveness and appropriateness of national codes of practice, policies, guidelines and legislation to safeguard or further the welfare of animals and protects the national interest. The Committee receives submissions from animal welfare organisations and agencies, industry or individuals concerning animal welfare issues. It has the power to establish working groups to carry out its functions. It prepares and furnishes written reports to the Minister for Agriculture, Fisheries and Forestry on matters that have been subject to inquiry by the Committee.

Australian Animal Welfare Strategy

In May 2004, the Primary Industries Ministerial Council (PIMC) approved the Australian Animal Welfare Strategy (AAWS), which was developed under the auspices of the National Consultative Committee on Animal Welfare (NCCAW).

The Strategy includes animals used in research and teaching, animals used for the production of food and fibre and other products, companion and guide animals, animals used for recreation, entertainment and display, native and introduced wildlife and feral animals.

In the next phase of the implementation of the AAWS, the Primary Industries Standing Committee (PISC) will work with a DAFF implementation team and co-ordinate the development of an implementation plan in consultation with key stakeholders and will provide advice on how best to address the issue of economic impacts that might arise from implementation of the Strategy.

Codes of Practice and Standard Operating Procedures

The Department of the Environment and Heritage contracted the NSW Department of Primary Industries (DPI) to undertake a Natural Heritage Trust project to develop Codes of Practice and Standard Operating Procedures for the humane capture, handling and destruction of feral animals. DPI has undertaken public consultation, including with other State and Territory agencies, in preparing these. While the Codes and Procedures have not been adopted nationally, some organisations are adopting them wholly or in part for their own use.

12.4 Proposed regulatory framework for 1080 products

Currently registered products for 1080 fall into one of the three following formulation categories:

- (a) aqueous solution. These are not used directly to poison the animals, but are loaded into baits. They are only available to authorised personnel of Government agencies, not to private landholders.
- (b) shelf-stable baits, lasting up to 1 year after manufacturing. Semi-dried meat baits and dry oat baits are typical examples of shelf-stable baits. These are supplied to the end-users.
- (c) short-life baits, to be used within a day after preparation. Fresh meat baits and carrot baits are two examples of the short-life baits. These are supplied to the end-users.

The supply and use of 1080 is regulated by a combination of Commonwealth and State legislation. The APVMA regulates 1080 up to and at the point of retail sale. Once sold or supplied to the end-user, it comes under the regulation of individual State legislation.

As a schedule 7 poison 1080 products are available only to specialised or authorised users who have the skills necessary to handle them safely. Products containing 1080 are declared 'Restricted Chemical Products' under the Agvet Code Regulations. As such, the products can only be supplied to or used by 'authorised person(s)'. Individual States set the authorisation criteria taking the APVMA's and State regulatory requirements in to account. Thus the authorisation criteria vary between States.

Currently aqueous solutions, shelf-stable baits and short-life baits are subject to registration. However the practicality of registering short-life baits has often been raised as an issue given the nature of the container in which it is supplied (usually a plastic bag) and the fact that the bait medium (chicken heads, animal offal, carrots etc) is perishable.

The review proposes that while the three product types (aqueous solutions, shelf-stable baits and short-life baits) are agricultural chemical products a more appropriate regulatory framework for 1080 product supply and use instructions would be as detailed in the following table:

Proposed regulatory framework for 1080 product supply and use instructions

Product	Regulatory status	Information to user
Aqueous solution	Registered	Label instructions on how to use concentrate in bait medium
Shelf-stable baits	Registered	Label instructions on how to lay baits. Label can include leaflet or reference to State Code of Practice
Short-life baits	Permit	Supply of leaflet on how to lay bait and adherence to State Code of Practice is a condition of the permit