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© State of New South Wales through Regional NSW 2022. The information contained in this publication is based on knowledge and understanding at the time of writing (February 2022). However, because of advances in knowledge, users are reminded of the need to ensure that the information upon which they rely is up to date and to check the currency of the information with the appropriate officer of the Department of Regional NSW or the user's independent adviser.

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Acronyms, definitions and abbreviations

1080	Sodium fluoroacetate
ACO	Authorised Control Officer
APVMA	Australian Pesticide and Veterinarian Medicines Authority
AQF	Australian Qualifications Framework
CPE	Canid Pest Ejector
CRA	Conservation Risk Assessment
EPA	Environment Protection Authority
FAAST	Feral Animal Aerial Shooting Team
FARMS	Financial and Rural Management System
LLS	Local Land Services
NPWS	National Parks and Wildlife Service, part of Office of Environment and Heritage
DPIE	Department of Planning, Industry and Environment
DPI	NSW Department of Primary Industries
PAPP	Para-aminopropiophenone
PCO	Pesticide Control Order
PPE	Personal Protective Equipment
PUNP	Pesticide Use Notification Plan
RCP	Restricted Chemical Product
RHD	Rabbit haemorrhagic disease
RHDV	Rabbit haemorrhagic disease virus
RSPAMP	Regional Strategic Pest Animal Management Plan
RSPCA	(NSW) The Royal Society for the Prevention of Cruelty to Animals
SDS	Safety Data Sheet
TSR	Travelling Stock Reserve
VPT	Vertebrate Pesticide Training (course provided to landholders by trained LLS staff)

Authorised officer means a person authorised as an authorised officer under a particular piece of legislation. An example of this is under Section 167 of *Local Lands Services Act 2013*. Section 185 of the Act states: ‘an authorising authority may appoint a police officer or any other person (including a class of persons) as an authorised officer for the purposes of this Act.’

Authorised control officer means a person who: –

- (a) holds a current certificate of completion or VET statement of attainment issued by NSW DPI’s Registered Training Organisation or another Registered Training Organisation on completion of the training and assessment components of the Vertebrate Pest Management course delivered by NSW DPI or a Registered Training Organisation; or
- (b) is employed by a public authority that has an EPA approved system for evaluating and establishing recognised prior learning that would, at least, be equivalent to obtaining accreditation for the successful completion of the training and assessment components of the Vertebrate Pest Management course; and
- (c) holds a current certificate of completion issued by NSW DPI for completion of the Vertebrate Pesticide Accreditation course; and
- (d) holds a current certificate of completion or VET statement of attainment on completion of the training and assessment components of a Chemical Accreditation training program assessed at Australian Qualifications Framework levels 3 and 4 and that has been issued by a Registered Training Organisation. To maintain currency of level 3 Chemical Accreditation a person must complete refresher training every 5 years but for level 4 Chemical Accreditation only initial accreditation is required for the duration of their employment, functioning as an Authorised Control Officer; and
- (e) is a person who:
 - (i) is a member of staff of an Local Land Services (LLS), a Wild Dog Destruction Board, NSW DPI, NPWS, or other NSW public authority and is currently employed as part of the Public Service under Part 4 of the Government Sector Employment Act 2013 to enable that NSW public authority to exercise its functions; or
 - (ii) has obtained approval to operate as an Authorised Control Officer from the Chair and CEO of the EPA prior to completing the training requirements in (c) above

Introduction

This manual was written primarily for government officers involved in the control of vertebrate pests in NSW. It provides specific information and guidance on vertebrate pest control procedures for NSW in addition to the requirements specified in Pesticide Control Orders (PCOs) issued under the *Pesticides Act 1999* (Pesticides Act).

The Manual is intended to promote uniform standards for vertebrate pest control throughout the State including guidance on procedures and requirements for storage, use and supply of vertebrate pesticides. It is essential reading for staff of Local Land Services (LLS), National Parks and Wildlife Service (NPWS) and all organisations involved in vertebrate pest control.

Information in this manual has been endorsed by all the major agencies involved in administration and implementation of vertebrate pest management in NSW and by the NSW Pest Animal Council.

Vertebrate Pesticide Training Committee

The Vertebrate Pesticide Training Committee (VPTC) guides the standards and provision of training for Authorised Control Officers (ACOs) in NSW.

The VPTC includes representatives from the NSW Department of Primary Industries (DPI), Environment Protection Authority (EPA), NPWS and LLS.

Tasks undertaken by the VPTC include:

- publish and maintain the accuracy of the NSW Vertebrate Pesticide Manual
- coordinate, deliver and validate the Vertebrate Pesticide Accreditation course
- review/contribute to content of new and existing PCOs for vertebrate pesticides in consultation with the EPA
- provide review of other vertebrate pesticide related publications.

Framework of vertebrate pest management

Whilst the vast majority of pest animal managers operate at a local or regional level, it is useful to understand the way that strategic pest animal management is conducted. An understanding of broader pest animal strategies at both the national and state level may provide a better understanding of, and opportunities to:

1. Target key areas to facilitate the control of existing species and surveillance for new ones.
2. Implement control at more appropriate times or integrating local control with larger scale control activities such as catchment, state or territory-based programs.
3. Adopt long-term planning within a national or state framework.
4. Communicate more effectively among stakeholders.
5. Seek funding and support for local or regional control programs which demonstrate integration with state and national strategies.

Australia Pest Animal Strategy

The Australian Pest Animal Strategy, agreed to by all Australian governments, sets out how governments work with each other, and with business, industry, and the community to manage the issues and problems associated with vertebrate pest animals in Australia.

In overview, the Australian Pest Animal Strategy establishes key objectives and actions that aim to prevent the introduction and spread of new pest animals in Australia and assist in managing the impacts of those that are already established.

The Invasive Plants and Animals committee is responsible for monitoring the implementation and review of the Australian Pest Animal Strategy. The Invasive Plants and Animals Committee reports to and operates in accordance with Terms of Reference defined by the National Biosecurity Committee. Membership of the committee comprises representatives from the Australian, state and territory primary industry or environment departments. The Invasive Animals Cooperative Research Centre, Commonwealth Scientific and Industrial Research Organisation and others have official observer status.

The Invasive Plants and Animals Committee convenes a number of Technical Working Groups (which may include Invasive Plants and Animals Committee members) to advise it on technical matters.

For a copy of the Australian Pest Animal Strategy go to:

<https://www.agriculture.gov.au/sites/default/files/sitecollectiondocuments/pests-diseases-weeds/consultation/apas-final.pdf>

National Wild Dog Action Plan

For many years now, wild dogs have been a major problem across all grazing industries in Australia. The issue is not just a matter of direct stock and financial losses, although these losses run into many millions of dollars each year; wild dogs are also increasingly acknowledged as a source of spread for serious animal-borne diseases. They are highly damaging to regional economies, to local wildlife, and are a significant animal welfare concern.

In response to this major industry concern, Wool Producers Australia initiated the National Wild Dog Action Plan Development Project in February 2013. The aim being to bring together all livestock peak bodies, research organisations and Commonwealth/State and Territory governments to confirm a consensus approach to managing the threat of wild dogs.

The development of the Plan showcases how a government/industry collaboration can quickly harness both goodwill and action against threats to Australian livestock industries. Download a copy from <http://www.pestsmart.org.au/national-wild-dog-action-plan/>

NSW Biosecurity Strategy 2013-2021

Biosecurity is defined as the preventative measures taken to protect the economy, environment and community from the negative impacts associated with pests, diseases, and weeds.

The NSW Biosecurity Strategy sets out the government's long-term objectives for how we will work together to manage biosecurity in NSW.

The NSW Biosecurity Strategy is based on the principle of shared responsibility and has been prepared to increase awareness about biosecurity issues and provide a framework for biosecurity management in NSW.

The strategy will be underpinned by policies, individual program strategies and implementation and operational plans that will provide a detailed road map of how the outcomes of this Strategy will be achieved.

Download a copy from <https://www.dpi.nsw.gov.au/biosecurity/managing-biosecurity/nsw-biosecurity-strategy-2021>

NSW Invasive Species Plan

The principal strategies for managing invasive species (including weeds, vertebrate and invertebrate pests) in NSW are outlined in the NSW Invasive Species Plan. The Plan aims to prevent new incursions, contain existing populations, and adaptively manage widespread species. The goal is to foster a cooperative culture where all relevant parties contribute to the aim of minimising the impacts of invasive species in NSW. The Plan outlines a coordinated response by stakeholders to minimise the impacts of invasive species in NSW using a risk-based approach. The Plan guides current and future investment in invasive species management and includes existing and planned activities as well as new projects that will commence as agencies redirect resources in response to the priorities in the Plan.

The NSW Invasive Species Plan identifies four Goals to realise its vision:

1. Exclude – prevent the establishment of new invasive species.
2. Eradicate or contain – eliminate or prevent the spread of new invasive species.
3. Effectively manage – reduce the impacts of widespread invasive species.
4. Capacity building – ensure NSW has the ability and commitment to manage invasive species.

Download a copy from <https://www.dpi.nsw.gov.au/biosecurity/vertebrate-pests/legislation/state-strategies/nsw-invasive-species-plan-2018-2021>

NSW Wild Dog Management Strategy

The primary objective of the NSW Wild Dog Management Strategy is to improve the management of wild dogs in NSW. In particular it aims to minimise the negative impacts of wild dogs on primary production, the environment and the wider community by clearly defining the roles and responsibilities of land managers and other community members in managing wild dogs. This objective aligns with Goal 3 of the NSW Invasive Species Plan to reduce the impacts of widespread invasive species.

Download a copy from <https://www.dpi.nsw.gov.au/biosecurity/vertebrate-pests/legislation/state-strategies/management-strategy>

State Pest Animal Committee

The State Pest Animal Committee was established in 2017 and has effectively replaced the previous NSW Pest Animal Council. Its terms of reference are broadly consistent with those of the State Weed Committee and key responsibilities include:

- overseeing a consistent approach to the formation and ongoing operation of Regional Pest Animal Committees
- overseeing development of tenure-neutral Regional Pest Animal Management Plans across the State, to ensure they are effective, risk-based, and inclusive of all major stakeholders
- advising on regional and State pest animal policy and regulation
- overseeing the implementation of key policy and strategy documents such as the Wild Dog Management Strategy
- improving the consistency and comprehensiveness of reporting on pest animal management inputs and outcomes across the State
- considering response options for managing high-risk incursions.

Principles of strategic pest animal management

Impacts of vertebrate pests

The focus of a vertebrate pest management plan needs to be on effectively managing the negative impacts of pest animals rather than on pest animal numbers. Such impacts may include:

- Agricultural – damage to crops, predation of livestock, pasture competition, land degradation, soil erosion, stream turbidity and the spread of weeds.
- Environmental – competition for food and shelter, habitat destruction and predation.
- Social – being a nuisance, damaging infrastructure or culturally important sites, causing traffic accidents and social and psychological effects on primary producers and their families and the general public.
- Disease – vertebrate pest animals may act as reservoirs and spread mechanisms for diseases that affect native wildlife, livestock, or people.

Cross-tenure approach

When developing regional or local vertebrate pest management plans consideration should be given to using a 'cross tenure' approach. This method involves the removal of all land tenure issues from the planning stage. This focuses on the problem, rather than on land ownership. Once the problem has been identified and the proposed control actions defined, the tenure boundaries can be reinstated, and the resources and costs allocated proportionally or according to some agreed formula.

Group control programs

Areas of pest animal abundance tend to be defined by topography, territoriality, and food availability. Property fences do not restrict pests, and control strategies should not be limited to artificial boundaries. Most pests are highly mobile and can readily replace those that are killed on individual properties. Unless actions are well planned and coordinated across a broader area of neighbouring properties, individual control programs are unlikely to have a lasting effect. Control programs are likely to be far more effective when multiple landholdings are involved and are strategically planned. Where possible cooperative action should use existing groups such as Landcare, bushfire brigades and social groups, including neighbouring public land managers.

The benefits of group control include better coordination and communication between all stakeholders. For example, during a pest control program everyone in the group knows who is baiting, where baits are laid, how much poisoned bait has been distributed, and when baits are to be picked up or destroyed.

Where a pest may be difficult to control, the use of a group's resources to help one land manager for the benefit of all justifies a coordinated approach. Peer pressure may be applied judiciously to facilitate control within an area if required.

The success or failure of pest animal control groups is largely dependent on the enthusiasm and dedication of the group coordinator. The coordinator should have credibility, be well respected and able to draw on personal and or other people's experiences. The coordinator should liaise closely with their LLS Biosecurity Officer.

Integrated pest management

Integrated pest management uses a combination of practices and control methods to manage pests. The use of an appropriate combination of control methods is likely to be more effective than a reliance on one or two methods alone. When conducting a rabbit control program for example it may be useful to employ poisoned baits in combination with harbour removal, warren destruction and the use of a biological control agent such as rabbit haemorrhagic disease virus (RHDV).

Control methods that may be considered when developing a local management plan could include:

- killing or removal by baiting, shooting, trapping, or mustering
- exclusion fencing or netting
- biological control
- habitat manipulation by removal of surface refuges and warren destruction
- changes in timing of animal husbandry management such as lambing or planting different crops.

Developing local and regional plans

Vertebrate pest management plans should provide a clear understanding of the pest problem in a region or local area, identify the impacts of pest animals, and set clear and achievable, goals objectives and actions as well as how the plan will be monitored. See Appendix A for more detail.

Legislation

Vertebrate pest control professionals, authorised officers and (ACOs) from government agencies (and other organisations) conduct themselves within the framework of a number of NSW and Commonwealth Acts and subsidiary legislation including Regulations and other legislative instruments. It is most important that all pest control professionals, regardless of who they work for, know and understand their various legislative functions, obligations and powers. This knowledge provides a high level of assurance that vertebrate pests are controlled effectively, efficiently and humanely, that the rights and obligations of all land managers are complied with, and that work health and safety hazards are identified, risk rated and appropriately managed.

The purpose of this section is to provide a summary of the key legislation governing pest animal management in NSW, as well as other related legislation. It is not intended to replace or interpret the legislation and all officers are urged to read the full text of the relevant Acts, Regulations and Orders.

Complete copies of the legislation listed below are available at:

www.legislation.nsw.gov.au, www.lawfoundation.net.au or www.austlii.edu.au

Note: Legislation in NSW for vertebrate pest management and pesticide use varies from legislation in other States and Territories. All agencies and officers from interstate jurisdictions, conducting pest animal management need to be aware of the relevant legislative requirements in their own State or Territory.

Pesticides Act

The *Pesticides Act 1999* is the primary legislative instrument controlling the use of pesticides in NSW and is administered by the NSW Environment Protection Authority (EPA).

The underlying principle of the Pesticides Act is that pesticides must only be used for the purpose described on the product label or an Australian Pesticides and Veterinary Medicines Authority (APVMA) permit and all the instructions on the label or permit must be followed. Consequently, all label or permit directions must be read by or explained to the user prior to each use of the pesticide.

The relevant sections of the Pesticides Act are summarised in Table 1 below.

This summary is not intended to replace or interpret the Pesticides Act and Pesticides Regulation 2017 (Pesticides Regulation) it is intended only to give a broad overview of the duties and responsibilities of ACOs as well as public and private land managers.

The Pesticides Act aims to protect and reduce the risk associated with the use of pesticides to human health, the environment, property, industry and trade and to promote collaborative and integrated policies and establish a legislative framework to regulate the use of pesticides.

Table 1. Summary of relevant sections of the Pesticides Act with regard to pest animals

Part 1 – Preliminary
<p>Section 4 – Definitions</p> <p>Harm an animal or plant includes poison, injure, contaminate, infect, distress, maim, impair or kill the animal or plant.</p> <p>Injury to a person includes any kind of physical or psychological injury whether temporary or permanent, including conditions such as nausea, allergic reaction, dizziness, headache, stress, and running nose or eyes.</p> <p>Section 5 – Definition of “pesticide”</p> <p>(1) A pesticide means:</p> <ul style="list-style-type: none">a) An agricultural chemical product (within the meaning of the Agvet Code), orb) A veterinary chemical product (within the meaning of the Agvet Code) that:<ul style="list-style-type: none">(i) is represented as being suitable for, or is manufactured, supplied or used for, the external control of ectoparasites of animals and(ii) is concentrated and requires dilution or mixing in water before use and(iii) is not prescribed under the <i>Stock Medicines Act 1989</i> as a low risk veterinary chemical product. <p>Note: The Agvet Code defines an agricultural chemical product to be a substance or a mixture of substances that is represented, imported, manufactured, supplied or used as a means of directly or indirectly:</p> <ul style="list-style-type: none">a) destroying, stupefying, repelling, inhibiting the feeding of, or preventing infestation by or attacks of, any pest in relation to a plant, a place or a thing, orb) destroying a plant, orc) modifying the physiology of a plant or pest so as to alter its natural development, productivity, quality or reproductive capacity, ord) modifying an effect of another agricultural chemical product, ore) attracting a pest for the purpose of destroying it. <p>The term also includes a substance or mixture of substances declared by regulations to be an agricultural chemical product. However, the term does not include a substance or mixture of substances declared by regulations not to be an agricultural chemical product.</p> <p>(2) For the purposes of this Act, a pesticide continues to be regarded as a pesticide even when it is mixed with some other substance (whether or not the other substance is a pesticide). However, a pesticide does not include a prescribed mixture or a mixture of a prescribed class or description.</p> <p>Note: Subsection (2) generally deals with the situation where a pesticide is diluted, or is mixed, before being used. The effect of the provision is that the mixing of a pesticide does not mean that it is no longer a pesticide.</p>

Penalties summarised

The Pesticides Act contains penalties of up to **\$250,000** in the case of a corporation, or **\$120,000** in the case of an individual for various offences under each Section.

Some Sections provide defences against prosecution such as:

'On-farm' exception where a person does not commit an offence if the person establishes:

- (a) that the injury or damage occurred, or is likely to occur, only on the agricultural farmland in respect of which the pesticide was used, and
- (b) that the person is the occupier of that land or is employed or engaged by the occupier of that land.

'On-farm'/residential premises exception where a person does not commit an offence if the person establishes:

- (a) that the harm occurred only on the agricultural farmland, or the residential premises, in respect of which the pesticide was used, and
- (b) that the person is the occupier of that land or those premises, or is employed or engaged by the occupier of that land and/or those premises.

Some Sections have a 'due diligence' defence where it is a defence in any proceedings against a person for an offence under this section if the person establishes:

- (a) that the commission of the offence was due to causes over which the person had no control, and
- (b) that the person took all reasonable precautions and exercised all due diligence to prevent the commission of the offence.

While other Sections state it is a defence in any proceedings against a person for an offence under sub-section 1 if the person establishes that

- (a) (Repealed)
- (b) the person complied with the relevant instructions on an approved label that was, at the time of the alleged offence, affixed or attached to, or appeared on, the container for the pesticide that was used; or
- (c) the person:
 - i. used the pesticide at a concentration or rate lower than that specified in the instructions on an approved label for the pesticide (provided any such lower concentration or rate was not prohibited by the instructions or by any pesticide control order), and
 - ii. otherwise complied with the relevant instructions on the approved label.

'Wilful or negligent misuse' of pesticides is distinguished from 'misuse of pesticides' in the Pesticides Act. There are higher penalties for people who wilfully or negligently misuse pesticides causing injury, damage or harm.

Part 2 – Control of Pesticides

Division 1 – Wilful or negligent misuse of pesticides

Section	What it does
Section 7 Injury to persons or damage to property resulting from pesticide use	(1) A person is guilty of an offence if the person wilfully or negligently uses a pesticide in a manner that: <ol style="list-style-type: none">(a) injures or is likely to injure any other person, or(b) damages or is likely to damage any property of another person.
Section 8 Harm to animals or plants resulting from pesticide use	(1) A person is guilty of an offence if the person wilfully or negligently uses a pesticide in a manner that: <ol style="list-style-type: none">(a) harms any non-target animal or non-target plant, or(b) if there is no approved label or permit for the pesticide – harms any animal or plant.
Section 9 Material harm to endangered, vulnerable or protected animals	(1) A person is guilty of an offence if the person wilfully or negligently uses a pesticide in a manner that materially harms: <ol style="list-style-type: none">(a) an animal that is a threatened species within the meaning of the <i>Biodiversity Conservation Act 2016</i>, or(b) any protected fauna within the meaning of the <i>Biodiversity Conservation Act 2016</i>. (2) When considering material harm, the following matters are taken into consideration: <ol style="list-style-type: none">(a) the number of animals harmed,(b) the type of animals harmed,(c) the local population of the type of animal harmed.

Division 2 – Misuse of pesticides	
Section	What it does
Section 10 Injury to persons or damage to property resulting from pesticide use	(1) A person must not use a pesticide in a manner that: <ul style="list-style-type: none"> (a) injures or is likely to injure any other person, or (b) damages or is likely to damage any property of another person
Section 11 Harm to animals or plants resulting from pesticide use	(1) A person must not use a pesticide in a manner that: <ul style="list-style-type: none"> (a) harms any non-target animal or non-target plant, or (b) if there is no approved label or permit for the pesticide – harms any animal or plant
Division 3 – General offences relating to the control of pesticides	
Section	What it does
Section 12 Possession of unregistered pesticide	A person must not possess an unregistered pesticide unless the person: <ul style="list-style-type: none"> (a) is authorised to do so by a permit, and (b) complies with the permit
Section 13 Use of unregistered pesticide	A person must not use an unregistered pesticide unless the person: <ul style="list-style-type: none"> (a) is authorised to do so by a permit, and (b) complies with the permit
Section 14 Requirement to read approved label and permit	(1) A person must on each occasion before using a registered pesticide <ul style="list-style-type: none"> (a) read an approved label for the pesticide or (b) ensure that an approved label for the pesticide is explained to the person (2) If a permit is in force in respect of a pesticide, a person to whom the permit applies must on each occasion, before using the pesticide: <ul style="list-style-type: none"> (a) read the permit, or (b) ensure that the permit is explained to the person (3) If a pesticide is mixed with any other substance, any requirement under subsection (1) or (2) in relation to that pesticide is not affected. <p>Note. The mixing of a pesticide with another substance still means that the approved label or permit for the pesticide must be read.</p>
Section 15 Using pesticide contrary to approved label	(1) A person must not use a registered pesticide in contravention of any instruction on an approved label for the pesticide unless the person: <ul style="list-style-type: none"> (a) is authorised to do so by a permit, and (b) complies with the permit (2) If a registered pesticide is mixed with any other substance, the requirement under subsection (1) in relation to the pesticide is not affected. <p>Note: The mixing of a registered pesticide with another substance still means that the relevant instructions on the approved label for the pesticide must be followed.</p>
Section 16 Keeping pesticides in container without approved label	(1) A person must not, without reasonable excuse, keep a registered pesticide in a container that does not have an approved label attached to the container.
Section 17 Use or possession of restricted pesticides	(1) A person must not possess or use a restricted pesticide unless authorised to do so by: <ul style="list-style-type: none"> (a) a restricted pesticide authorisation or (b) a pesticide control order

Part 4 – Pesticide control orders	
Section	What it does
Section 38 Making of pesticide control order	(1) The Environment Protection Authority may, with the approval of the Minister, make a pesticide control order.
Section 39 Operation of pesticide control order	(1) A pesticide control order may: (a) prohibit or control the use of a pesticide or class of pesticide that is specified in the order, or (b) authorise the use or possession of a restricted pesticide or class of restricted pesticide that is specified in the order.
Part 6 – Licences and restricted pesticide authorisations	
Division 1 Licensing of prescribed pesticide work	
Section	What it does
Sections 45 to 53	These sections detail the requirements for licensing for specific commercial pesticide work as defined under Part 2 of <i>The Pesticides Regulation 2017</i> . Persons applying pesticides (e.g. 1080 baits) by aircraft are required to hold an Aerial Applicator Pilot licence and also hold or be employed by a business or person who holds an Aerial Applicator Business licence. There are also licence requirements for Pest Management Technician and Fumigation work.
Part 10 – Procedural provisions	
Division 6 – Other procedural provisions	
Section	What it does
Section 111 Causing or permitting offence	(1) A person who causes or permits, by act or omission, another person to commit an offence under a provision of this Act or the regulations is guilty of an offence under that provision and is liable, on conviction, to the same penalty applicable to an offence under that provision.
Part 11 – Miscellaneous	
Section	What it does
Section 119 Regulations	(1) The Governor may make regulations, not inconsistent with this Act, for or with respect to any matter that by this Act is required or permitted to be prescribed or that is necessary or convenient to be prescribed for carrying out or giving effect to this Act.

Other relevant legislation

The other major pieces of legislation that need to be considered when conducting pest animal management and using pesticides in NSW includes but is not limited to:

- *Biosecurity Act 2015*

The *Biosecurity Act 2015* (Biosecurity Act) embeds the principle that biosecurity is a shared responsibility of government, industry and individuals within communities. It provides for a flexible, outcomes-based approach to managing the biosecurity risks and impacts posed by animal and plant pests and diseases, weeds, contaminants and by pest animals.

- *Agricultural and Veterinary Chemicals Code Act 1994*

The registration of agricultural and veterinary chemicals and their products is conducted through a national registration scheme. All aspects of agricultural and veterinary chemicals up until the point of retail sale are controlled by this Act.

- *Firearms Act 1996*

Prescribes and controls the use of firearms in NSW.

- *Game and Feral Animal Control Act 2002*

Game and feral animal hunting in NSW is subject to regulations to ensure the safety of all users of public land.

- *Local Land Services Act 2013*

The *Local Land Services Act 2013* (LLS Act) outlines the role of LLS in administering, delivering and/or funding programs and advisory services associated with agricultural production and biosecurity.

- *National Parks and Wildlife Act 1974*

Native birds, reptiles, amphibians, and mammals, except the dingo are protected in NSW under this Act.

- *Prevention of Cruelty to Animals Act 1979*

Regulates acceptable standards for animal welfare.

- *Protection of the Environment Operations Act 1997*

Principally deals with the regulation of activities that have the potential to pollute or otherwise harm the NSW environment.

- *Weapons Prohibition Act 1998*

This Act deals with prohibited weapons that may be used in certain pest control programs e.g. noise suppressors in urban pest control.

- *Work Health and Safety Act 2011*

Provides a balanced and nationally consistent framework to secure the health and safety of workers and workplaces.

- *Biodiversity Conservation Act 2016*

This purpose of this legislation is to maintain a healthy, productive, and resilient environment for the well-being of the community, now and into the future, consistent with the principles of ecologically sustainable development.

Summaries of Sections of the Acts listed above under the heading “Other relevant legislation” are provided in Appendix B.

Pesticide Control Orders

When the APVMA declares pesticides to be restricted chemical products (RCP), such RCPs can only be supplied to and used by authorised persons under the Pesticides Act. The Pesticides Act requires a person who uses a RCP to be authorised to do so by way of PCOs or a restricted pesticide authorisation. PCOs specify controls over the preparation, use, clean-up of equipment and disposal of RCP, bait material, and animal carcasses.

Each PCO is published in the NSW Government Gazette and commences on the date specified in the order. An advertisement is also placed in certain newspapers so that the public are made aware that the EPA has made these orders.

Currently, sodium fluoroacetate (1080), pindone concentrate, 4-aminopyridine, alphachloralose, RHDV and para-aminopropiophenone (PAPP) are all classified as RCPs and must be used in accordance with the directions of the relevant PCO.

ACOs should ensure that they always have current PCOs for the RCPs they issue to land managers. ACOs are also required to provide land managers with a copy of the PCO for each RCP they issue to land managers. PCOs can be downloaded from the EPA website at <http://www.epa.nsw.gov.au/pesticides/pco.htm>

All pesticide users should take reasonable care to protect their own health and the health of others when using a pesticide. They should also make every reasonable attempt to prevent damage occurring from the use of a pesticide, such as off-target drift onto sensitive areas or harm to domestic and non-target animals, endangered and protected species.

Pesticides Regulation

The Pesticides Regulation specifies amongst other things the requirements relating to:

- user qualifications
- record keeping and
- notification requirements for a person to use pesticides when carrying out agricultural or commercial operations.

Records

Records must be made within 48 hours of application, be in legible English, and kept for not less than 3 years.

If a contractor, LLS or other authority applies pesticides to a person's property, then they must provide a copy of the record of pesticide application to that person.

While no set form has to be used, records must include the following:

- The full product name of the pesticide used, such as 1080 poison in chicken wingette baits, Foxoff®, etc.
- Description of the situation for which you used the pesticide, such as rabbit control in pasture.
- The rate of application and the quantity of pesticide bait applied e.g. amount of baits per hectare and total number used.
- A description of the equipment used such as bait layer, using cut furrow-trailing method.
- The property address and a delineation of the area where the pesticide baits were laid, such as, 2km trail of bait laid in paddock D, a sketch of the area may be useful.
- The date and time of the application including start and finish times and the date baits were retrieved.

-
- The name, address and contact details of the person who applied the pesticide.
 - The name, address and contact details of the owner or the person who has the management or control of the land.
 - Weather conditions – this only applies to using spray equipment however the EPA recommends recording wind speed and direction and any significant changes that occur during application when aerially applying vertebrate baits.

A factsheet on Pesticide Record Keeping Vertebrate Pest Baiting is available at <http://www.epa.nsw.gov.au/resources/pesticides/baiting.pdf>

LLS and other authorised agencies keep a record of the supply and usage of baits using various systems e.g. the Financial and Rural Management System (FARMS) and Vertebrate Pesticide Registers. This record shows details of the bait type used, the person the bait was issued to and the property the bait is destined for, it is not a pesticide use record.

A pesticide use record must be made by the end user; this may be the land manager, an employee or contractor, or an LLS, NPWS or other government agency staff member who places the baits on public or private land.

Record keeping and licence requirements for aerial application of baits

Different record keeping rules apply to situations where poisoned baits are distributed from an aircraft. A pesticide application record applicable to the bait line must be completed by the aerial contractor and supplied to the land manager. Contact the EPA if further information on record keeping rules for aerial pesticide application is required.

Licence for aerial applicators and operators

Baits can only be applied from an aircraft if the pilot holds a NSW EPA Aerial Applicator Pilot Licence, has an agricultural rating and the aircraft has an air operator's certificate endorsed for pesticide application and is employed or is the holder of an EPA Aerial Applicator Business licence. Bait droppers need to have at least Australian Qualifications Framework (AQF) level 3 chemical use accreditation.

User training

All pesticide users must complete the prescribed training qualifications in pesticide use and renew this training every five years by completing a refresher course. This includes anyone who uses in their work any type of pesticide which includes herbicides, insecticides, fungicides, bactericides, poisoned baits, poisoned lures and rodenticides.

If a person is working as a pest management technician, conducting fumigation or working as an aerial pesticide applicator under the Pesticides Act the following training requirements do not apply as there are separate training requirements necessary for these types of work.

AQF level 2 accreditation is the minimum prescribed level of competency. An AQF level 3 accreditation is required for unsupervised chemical application.

An ACO must hold an AQF level 4 and complete all other training requirements including the Vertebrate Pesticide Accreditation course, which gives them the authority to supply RCPs such as 1080 pindone and provide instruction to land managers on the safe and effective use of these restricted products.

The minimum pesticide use training requirements for land managers who only use pre-prepared or manufactured vertebrate pest products and no other pesticides is the upgraded Vertebrate Pesticide Training (PRT) course provided by specially trained LLS staff.

Pesticide Use Notification Plan

Clause 40 of the Pesticides Regulation requires a public authority to develop a Pesticide Use Notification Plan (PUNP) for public spaces where pesticides are applied and to which the public has access. Public spaces requiring a PUNP may include gardens, picnic areas, playgrounds, parks, sporting fields, road verges, electricity or rail easements legally accessible by the public, national parks, state forest, and crown land. Water bodies on public lands must be included in a PUNP if aquatic weeds are to be sprayed or if pest fish are to be controlled by application of pesticides to water.

The plan has to define the means by which the community will be notified, such as on-site signs, letters to affected community members, and news items in the local paper or on the local radio.

The PUNP should set out what information will be provided to the community. This should include, the product name of pesticide applied, the purpose for which the pesticide was applied such as fox control, the place, the date, applicator contact details (phone number and/or internet address) and warnings in regards to restricted entry during the application period.

Agricultural fumigant use

The occupational use of certain fumigants in NSW requires an EPA fumigation licence which is issued under Section 49 of the Pesticides Act – previously this was a function carried out by NSW WorkCover (now called SafeWork NSW). The LLS, NPWS and landholders have an exemption from the requirements of having a fumigation licence for the application of aluminium phosphide. These exemptions currently have an expiry date and will be renewed by the EPA prior to reaching their expiry date.

Regulation of fumigants with regards to work health and safety provisions continue to apply under the *Work Health and Safety Regulation 2017* of SafeWork NSW.

Governance

Control of vertebrate pest species in NSW

Under the Biosecurity Act government, industry and the people of NSW share the responsibility for protecting the economy, environment and community by preventing, managing or eliminating the negative impacts of pest animals.

Regional Strategic Pest Animal Management Plans (RSPAMPs) have been developed for each of the Local Land Services (LLS) regions in consultation with public and private landholders and key regional stakeholders.

The RSPAMPs inform community members of the priority pest animal species within their region, provide guidance on the general biosecurity duty and other regulatory provisions in place to regulate the management of pest animals. They also provide examples of control and containment activities that a landholder or other community member can participate in to discharge their general biosecurity duty.

Exceptions or limits to the protection of native animals

Some native birds are not protected in certain parts of NSW because they are either agricultural or pastoral pests:

- Sulphur-crested cockatoos and galahs have been declared 'locally unprotected' west of the Great Dividing Range (in the Central and Western divisions of the state), because of the damage they do to grain and oilseed crops.
- Crows and ravens (corvids) are protected only in the counties of Camden (Illawarra region), Cumberland (Sydney basin) and Northumberland (Hunter region), because they are blamed for the deaths of lambs in other areas.
- The purple swamphen (*Porphyrio porphyrio*) is not protected in 10 irrigation districts and areas in the Riverina region, where the species causes considerable damage to irrigated crops such as rice.

The householder has the responsibility for rat and mouse control in urban areas, and control is often carried out by private pest control firms. When mice reach plague proportions in rural areas, individual land managers may attempt control. LLS and NSW Department of Primary Industries (DPI) may provide advice on control.

Domestic dog issues are handled by local government under the *Companion Animals Act 1998*.

If native animals are shown to be a threat to human safety, damaging property and/or causing economic hardship, land managers may apply to the NPWS for a licence under the *National Parks and Wildlife Act 1974* (NPW Act) to manage the impact.

NPWS regional pest management strategies aim to manage weeds and pest animals in national parks and reserves and for threatened species across NSW. These strategies provide a strategic approach to pest management on lands managed by the NPWS under the NPW Act, and feed into the delivery of the NSW Biosecurity Strategy 2013-2021. NPWS pest management is focused on threatened species protection, where pests are likely to affect neighbouring lands and where other park values are affected.

Two legislative instruments drive the focus of activities. Under the NPW Act activities are undertaken to protect the environment and manage pest animals on NPWS estate. The *Biodiversity Conservation Act 2016* aims to support conservation and threat abatement actions to slow the rate of biodiversity loss and conserve threatened species and ecological

communities in nature and to support and guide prioritised and strategic investment in biodiversity conservation.

Responsibilities for vertebrate pest management in NSW

Department of Primary Industries – Biosecurity

The DPI has an enabling role for pest animal management in NSW. Its primary responsibilities are:

- establishment of the regulatory framework for pest animal management in NSW
- facilitation of the State Pest Animal Committee to promote coordination and improvement in pest animal management
- delivery of training in the management of pest animals
- administration and governance of treasury funding allocated to pest animal management
- delivery of state level reports on the management of pest animals including: NSW State of Biosecurity report, NSW Invasive Species Plan and the publication of distribution maps for priority pest animals.

Local Land Services

LLS are formed under the *Local Lands Services Act 2013* (LLS Act). LLS bring together agricultural production advice, biosecurity, natural resource management and emergency management into a single organisation. LLS are also charged with developing LLS Strategic Plans to give state and region direction and priorities.

In relation to pest animal management Local Land Services works with the community and relevant stakeholders and Regional Pest Animal Committees to prepare and deliver Regional Strategic Pest Animal Management Plans.

Environment Protection Authority

The EPA regulates the use of all pesticides in NSW, after the point of supply under the Pesticides Act and the Pesticide Regulation. This involves developing and enforcing pesticide use laws for NSW, such as producing PCOs which stipulate how vertebrate pesticides which are RCPs can be used to reduce exposure and minimise impacts on the environment, non-target animals and plants, people and trade. The EPA also provides information and advice on management of pesticides.

Department of Planning, Industry and Environment (DPIE) - National Parks and Wildlife Service

NPWS is responsible for managing National Parks and Nature Reserves for the protection and conservation of biodiversity in NSW. This involves the development and implementation of Regional Pest Management Strategies which prioritise programs and specific actions for invasive species including vertebrate pests on lands managed under the NPW Act.

NPWS also works with other government agencies and the community to protect biodiversity and agriculture on neighbouring private lands. It also provides advice and undertakes species recovery, threat abatement and community education programs and research to ensure that threatened species are protected.

DPIE - Regional Operations Group

Delivers integrated and customer focused services at the regional and local level to strengthen communities and partnerships across NSW. This includes services, programs and grants to support land use planning, threatened species, native vegetation, education, community engagement, energy efficiency, volunteering, environmental water management, coast and flood protection, compliance and enforcement, adapting to a changing climate and private land conservation.

Land managers, communities and special interest groups

Effective long-term pest animal management requires the cooperation of a majority of land managers in any area. Private land managers may be obligated under PCOs to control some pest animals on their land. Pesticide Control Orders assist in allowing for coordinated pest animal control programs across affected land tenures. Acknowledgement should be given to the important role of community volunteers and special interest groups in the management of vertebrate pests. These individuals and groups provide hundreds of hours each week assisting in the management of private and public lands through direct vertebrate pest control and monitoring activities.

DPIE - Crown Lands

DPIE – Crown Land is a significant land manager in NSW administering and managing Crown land. DPIE – Crown Lands implements and participates in coordinated invasive species management strategies on land under its direct control. It also supports activities undertaken by Crown land managers that manage land on its behalf.

Forestry Corporation

Forestry Corporation of NSW is the largest manager of commercial native and plantation forests in NSW. Managing more than two million hectares of forests, the corporation balances the need for products and services, such as timber and recreational opportunities, with the needs of forest ecosystems to ensure sustainable management of the State's forests. In terms of pest animal management, Forestry Corporation has developed and implemented Pest Animal Management Plans and works with other government agencies as well as adjoining landowners.

Department of Primary Industries - Game Licensing Unit

The Game Licencing Unit within DPI is established under the *Game and Feral Animal Control Act 2002*. The Game Licensing Unit is responsible for the administration of public land hunting in NSW. This includes hunter licensing, hunter education, assessing compliance of game hunters and enforcing hunting regulations.

Local government and other public land managers

All public land managers including Local Councils and County Councils have an obligation under the LLS Act to manage declared pests on land they own, occupy or manage.

Industry

Industry has three main roles in invasive species management:

- Managing pests on land and in aquatic environments used for production.
- Managing the trading of known invasive species held by zoos or collectors.
- Preventing vectors or pathways for invasive species establishment through movement of goods, produce and equipment or related activities.

Vertebrate pest management planning

Local Land Services strategic plans

The LLS Act under Part 4 specifies the requirements for both State-wide and Local Strategic Plans. Each LLS is required to develop a Local Strategic Plan under Part 4 of the LLS Act. These strategic plans must address the state priorities for LLS. One of these priorities is biosecurity, including animal pest and disease and plant pest and disease prevention, management, control and eradication.

The purpose of the strategic plans is to set the vision, priorities and overarching strategy for LLS at the state and local level, with a focus on appropriate economic, social and environmental outcomes. The State Plan will have effect for a period of ten years whilst the Local Plans will have effect for five years.

Local Land Services Regional Strategic Pest Animal Management Plans

Each LLS will have a RSPAMP for its region as part of their documented planning, monitoring and control work regarding pest animals.

The RSPAMPs:

- identify the priority pest species in each local area
- outline management outcomes for each pest type
- outline local management approaches and provide local guidance on how people can contribute to managing pest animals.

LLS also:

- provide advice, education and guidance to land managers about pest management
- coordinate local pest management programs and distribute Restricted Chemical Products vital for effective management of many priority pest animals.
- enforce the regulations when necessary.

Appendix C provides guidelines.

Local Pest Animal Management Plans (LPAMP) should be developed for the priority pest animal species listed in the RSPAMP. A LPAMP allows priority pest animals to be managed efficiently across-tenure, tailored to a community's specific needs and available resources with a process for monitoring and review of the plan's success.

NPWS Branch Pest Management Strategies

NPWS Branch Pest Management Strategies (BPMS) detail priorities for each region, including actions listed in the Saving our Species Plans and Threat Abatement Plans as well as other actions such as wild dog and feral pig control to protect neighbouring properties and site-based weed control.

NPWS BPMS were developed in consultation with the community. They aim to minimise the adverse impacts of pests on biodiversity, protected areas and the community. They achieve this by identifying the highest priority programs and focusing on these, ensuring that actions are achievable, and delivering measurable outcomes.

The BPMS recognise that pest species are a problem across the landscape. Programs are developed and often carried out in collaboration with neighbours, other government agencies, LLS, local councils, regional pest committees, universities and community groups.

NPWS Programs

NPWS pest management programs are defined by;

- Reserve: where the program is taking place
- Site name: clearly identifies where in the reserve(s)
- Target pest animals or weeds: may be multiple species
- Asset at risk: ecological, heritage, agricultural, economic
- Aim of control: eradication, containment or asset protection
- Action: control techniques and monitoring
- Priority: critical, high, medium, low.

Prioritisation ensures resources are given to programs and actions where it is most needed for protection of NPWS assets (e.g. biodiversity) and our neighbours' assets (e.g. livestock).

Four critical priorities are:

- Threatened Species Conservation
- New and Emerging pest species
- Economic Impacts on neighbours
- Health and Disease.

Vertebrate pesticides

This section provides information on the preparation and use of pesticides to control vertebrate pests. It also covers the authorisations to obtain, store and supply the RCPs; 1080, pindone concentrate, PAPP and RHDV.

These pesticides have significant economic, social, public health and environmental benefits; however, many vertebrate pesticides are toxic to non-target species and there are environmental risks associated with their use. Consequently, they are strictly regulated in NSW. It is essential that suppliers and users of vertebrate pesticides comply with legislation for pesticide use. Vertebrate pesticides need to be used in a safe, efficient, and economical manner to maximise their benefits and to ensure their continued availability. Pesticides are just one element of pest management and should be used in combination with other techniques as part of an integrated pest animal management plan.

A number of RCPs are available for use in NSW under the *Agricultural and Veterinary Code Act 1994*. A summary of the main vertebrate pesticides currently registered and permitted for use in NSW are listed in Appendix D.

A number of government agencies and organisations will have their own standard operating procedures in relation to vertebrate pest use and management. These must be followed in addition to this document.

Access to restricted chemical products

The PCOs issued under Section 38 of the Pesticides Act specify the requirements around the possession and use of RCPs such as 1080 liquid concentrate, pindone liquid and powder concentrate, PAPP and RHDV for the preparation and supply of baits by ACOs subject to the conditions specified in the relevant PCO or APVMA permits.

An ACO is a person who is a member of staff of LLS, Border Fence Maintenance Board, DPI, NPWS or other NSW public authority and has undergone specific training and received accreditation in the storage, preparation and use of these RCPs. The requirements to gain and maintain accreditation as an ACO are outlined in the PCOs.

Vertebrate pesticide usage and supply record

Separate, clear and accurate registers (manifests) must be kept by all ACOs using vertebrate pesticide concentrates and manufactured products. Records in these registers must be made within 48 hours of the activity and kept for at least three years from the last date recorded in it.

The register must contain every usage and supply record and may be a hard copy or electronic. Only ACOs who use the vertebrate pesticides may make or approve entries into the usage record, subject to ACOs who work together having some prior agreement.

Auditing vertebrate pesticides

- For all RCP concentrates and manufactured products monthly audits must be undertaken by the ACO and submitted to the 1080 Supervisor each month. This should be within the first three working days each month where practicable or by local agreement.
- The 1080 Supervisor will undertake twice yearly audits of all RCP concentrates and manufactured products.
- For all other vertebrate pesticides a minimum of a quarterly audit is undertaken by the ACO responsible for those pesticides. The 1080 supervisor must be shown the results of these audits and they must audit these pesticides annually.

Auditing 1080 liquid concentrate

To undertake audits of 1080 liquid concentrate ACOs should measure by weight. Use a set of accurate digital scales that will measure with at least 1-gram graduations. Scales need to be calibrated and equipment maintained as part of the twice-yearly audits by the 1080 supervisor.

When receiving 1080 liquid from your supervisor, enter the amount in mls or grams to your register that has been calculated by your supervisor. This happens automatically for LLS staff through FARMS transfer. This calculation is made by subtracting the average bottle weight, including cap, label and attached “Directions for use” booklet (from manufacturer), from the total weight, bottle, cap, label, “Directions for use” booklet and 1080 liquid. If you receive 1080 direct from manufacture, then apply the same rule and add this amount to your register.

Prior to using a new bottle of 1080 remove the clear wrapping, leave the label intact.

To audit 1080 liquid concentrate, (Bottle).

1. Weigh the container of 1080 liquid concentrate, label, “Directions for use” and cap on.
2. Subtract the average weight of the bottle + cap. (* from manufacturer see below)
3. This gives the weight of 1080 solution.
4. Enter this amount into your register as grams or mls.

To audit 1080 liquid concentrate (injection gun with bottle attached or injection gun, bottle and plastic line).

1. Empty injection gear of all 1080 solution and weigh.
2. Substitute this weight for average bottle weight in 2 above and then follow same directions to 4 above.

There may be instances where the “Directions for use” booklet are removed from the bottle. Whenever 1080 concentrate is ACO to ACO transferred the “Directions for use” booklet must be attached.

Worked example - Audit of 1080 bottle

Total weight of bottle + 1080 liquid concentrate + “Directions for use” booklet = 1110 g

Weight of bottle = 100 g

Amount of 1080 liquid concentrate = 1110 g – 100 g = 1010 g

1010 g/mls is the audit amount entered into the register

* Bottle weights with and without attachments is provided in Table 2 below.

Table 2. Bottle weights for 1080 Concentrate with and without attached “Direction for use” booklet.

Product	Bottle weight (g) with cap and attached “Directions for use” booklet	Bottle weight (g) with cap and “Directions for use” booklet removed
ACTA 1080 Concentrate 200 ml	*generally, doesn't have booklet attached	30
ACTA 1080 Concentrate 1L	100	75
ACTA 1080 Concentrate 5 L	230	205
PAKS 200 ml	30	-
PAKS 1L	80	-

Minimum information for usage and supply records

The following is a list of information that should be recorded when completing usage and supply records. Appendix E provides the list below in a format that can be ticked and used for recording purposes.

- Type of vertebrate pesticide register e.g. 1080 liquid concentrate or manufactured bait.
- Date - month and year of record.
- Agency or organisation's name.
- ACO/s name/s.
- Carried forward balance.
- Usage and supply records to end users.
- Daily receipt (from), transfer (to) record and use for that month.
- Balance left in stock.

The usage and supply records to end users.

- Bait type such as red meat (wild dog) carrot (rabbit).
- Number or quantity (kg) of bait used.
- Name of person the bait was supplied to.
- Location of bait usage (property name).

Vertebrate pesticide storage

Below is the list of essential storage requirements (including *Work Health and Safety Regulation 2017* (WHS Regulation) and the Australian Standards (*AS 2507-1998 The storage and handling of agricultural and veterinary chemicals*) that the ACO's employer must comply with for all vertebrate pesticides. Additional requirements for specific vertebrate pesticides must also be complied with and are listed under the relevant headings on the following pages.

General storage requirements

The general pesticide storage facility requires all of the following features:

- Located in a dry area out of direct sunlight.
- Located in a secure separate building or in a secure segregated area that is not used as an office.
- Concrete or impervious floors bunded with spillage containment.
- Storage area shall be ventilated as required (dilution, natural or mechanical ventilation).
- Impervious shelving and spill control trays on shelving.
- The store should be constructed from non-combustible materials.
- Locked room and/or caged area accessible only to ACOs and those persons approved by ACOs.
- Lighting sufficient to allow labels to be read i.e. at least 200 lux, but not so that labels are exposed to direct sunlight, which causes deterioration.
- Spills kit.
- Appropriate fire extinguisher(s).
- Free access to safety showers and eye wash facilities (or portable shower and eyewash kits).
- All electrical installations shall be kept to a minimum.
- Fuse board with residual current device must be kept outside the building.

- Emergency contact details – Poisons Information Centre (131126), 000 for ambulance, police and fire brigade, local hospital and doctor, State Emergency Services, SafeWork NSW (131050).
- Appropriate signage (see examples Figure 1), (Clause 353 of WHS Regulation requires a safety sign to control an identified risk in relation to using, handling, generating or storing hazardous chemicals at a workplace and warn of a particular hazard associated with the hazardous chemicals). For placarding refer to SafeWork NSW guidelines for “[Placarding for storage of hazardous chemicals](#)”.
- When manifest threshold quantities of hazardous chemicals are involved, provide a manifest and site place (Division 4 Placards as per *WHS Regulation 2017*) and notify SafeWork NSW of this circumstance.
- A current Safety Data Sheet (SDS) for every chemical and poison should be located in a readily accessible weatherproof container positioned outside the building where they can be easily retrieved by emergency service personnel in case of an incident.
- Personal protective equipment (PPE) for handling of pesticides must be retained on the premises in a separate cabinet.

Figure 1. Example of signage for pesticide storage facility.



For all workplace purposes Globally Harmonised System pictograms can be used and when chemicals stored above the placard quantities, your above Dangerous Goods pictograms can be used see Figure 1.

For details such as displaying placards, maintaining placards, placards for bulk storage, placards for packages etc. refer WHS Regulation, Schedule 13 – Placard requirements.

The best practice for operation of the pesticide storage facility encompasses:

- Segregation of classes of chemicals from one another e.g. flammable from non-flammable product aerosols by three metres; combustible liquids from flammable solids by five metres; corrosive substances from other chemicals by three metres (refer the storage incompatibilities segregation guides).
- Scheduled poisons shall be stored as required by poisons schedule (as per manufacturer’s SDS)
- Storage of liquid containers beneath containers with dry formulations e.g. powders and granules.
- Ensuring all chemical containers are sealed and labels intact.
- Do not decant or dilute the chemicals inside the storage area.
- Use of older stock first – this is facilitated by the dating on the storage register.
- Keep the amount of flammable and combustible substances at the lowest practicable quantity.

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- Opening flammable liquid containers, Dangerous Goods Class 3, outside the chemical store in a purpose-built or well-ventilated area.
 - Securing leaking or damaged containers within a larger drum or by decanting into a secure container and transferring the label or label information to the new container.
 - Keeping packages and liquid containers at least 600 mm from the inner crest of the bund wall.
 - Keeping the storage clear of residues and combustible wastes.
 - Clearing the ground outside the store of combustible vegetation or refuse for at least three metres.
 - Ensure entry and exits are not blocked and do not store or handle chemicals in such a way that block entrance or exit in an emergency.

Additional storage requirements for vertebrate pesticide concentrates

- A bund made from concrete or impervious material, able to contain a spillage of at least 110% of the largest container or 25% of the total volume of liquid being stored, whichever is largest.
- A locked storage cabinet constructed from metal accessible only by ACOs.
- Access to water for washing, particularly an eye wash.
- The storage cabinet must be affixed to the building.
- The building and cabinet where hazardous chemicals are stored must have appropriate safety signage to warn of any hazards associated with the hazardous chemicals.
- For placarding refer to SafeWork NSW guidelines for [“Placarding for storage of hazardous chemicals”](#).
- For storage of pindone liquid the storage cabinet can be a locked refrigerator.

Additional storage requirements for manufactured baits and Canid Pest Ejector capsules

- These items must be kept in a locked metal storage cabinet. This cabinet must be in a locked room and/or caged area and must only be accessible to ACOs and those persons approved by ACOs
- The building where hazardous chemicals are stored and the cabinet must have appropriate safety signage to control an identified risk and warn of a particular hazard associated with the hazardous chemicals.
- For placarding refer to SafeWork NSW guidelines for [“Placarding for storage of hazardous chemicals”](#).
- The storage cabinet must be affixed to the building.

Additional storage requirements for rabbit haemorrhagic disease virus

- Store RHDV freeze dried product in a locked refrigerator below 4 - 8°C that is only accessible by ACOs.
- RHDV bait or manufactured product must be stored in a lockable storage area ready for use and only be accessible by ACOs and those persons approved by ACOs.

Additional storage requirements for fumigants

- Cross-flow ventilation by vents in opposite walls above bund height.
- At least five metres from any ignition source.
- The building and cabinet where hazardous chemicals are stored must have appropriate safety signage to warn of any hazards associated with the hazardous chemicals

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- For placarding refer to SafeWork NSW guidelines for “Placarding for storage of hazardous chemicals”.
 - Access to water for washing, particularly an eye wash.

Aluminium phosphide:

- Should be stored away from water and other liquids which will cause immediate release of phosphine gas.
- At least 5 m away from Schedule 6 and 7 poisons such as 1080, Larvacide® (chloropicrin) and pindone.
- Do not store aluminium phosphide containers in a small enclosure that has no ventilation.
- Dispose of the residues/wastes appropriately as per SDS directions.

Chloropicrin:

- Should be stored away from extreme heat.
- Do not store near oxidising material or water.
- Chloropicrin must be stored securely in a tray capable of holding at least 100% of the largest container or 25% of the total volume of liquid being stored, whichever is largest.
- Soda ash or lime should be stored to be used to neutralise any chloropicrin spillage that occurs. Keep approximately an equal amount of soda ash or lime and chloropicrin. That is, if there is usually about 50 L of chloropicrin in store then keep about 50 kg of soda ash or lime on hand.
- Refer to SDS for spill management.

Carbon monoxide storage

DEN-CO-FUME® fumigant cartridges are classified as Dangerous Goods Class 1.4G and must be stored and transported safely. When DEN-CO-FUME® cartridges are stored in bulk consider Dangerous Goods Storage related regulatory requirements. It is flammable, so consider compatibility and separation issues.

Store carbon monoxide fumigant cartridges in the closed, original container in a dry, cool, well ventilated area out of direct sunlight and away from other heat or ignition sources or oxidising agents.

Bait preparation vertebrate pesticides

Bait preparation sites

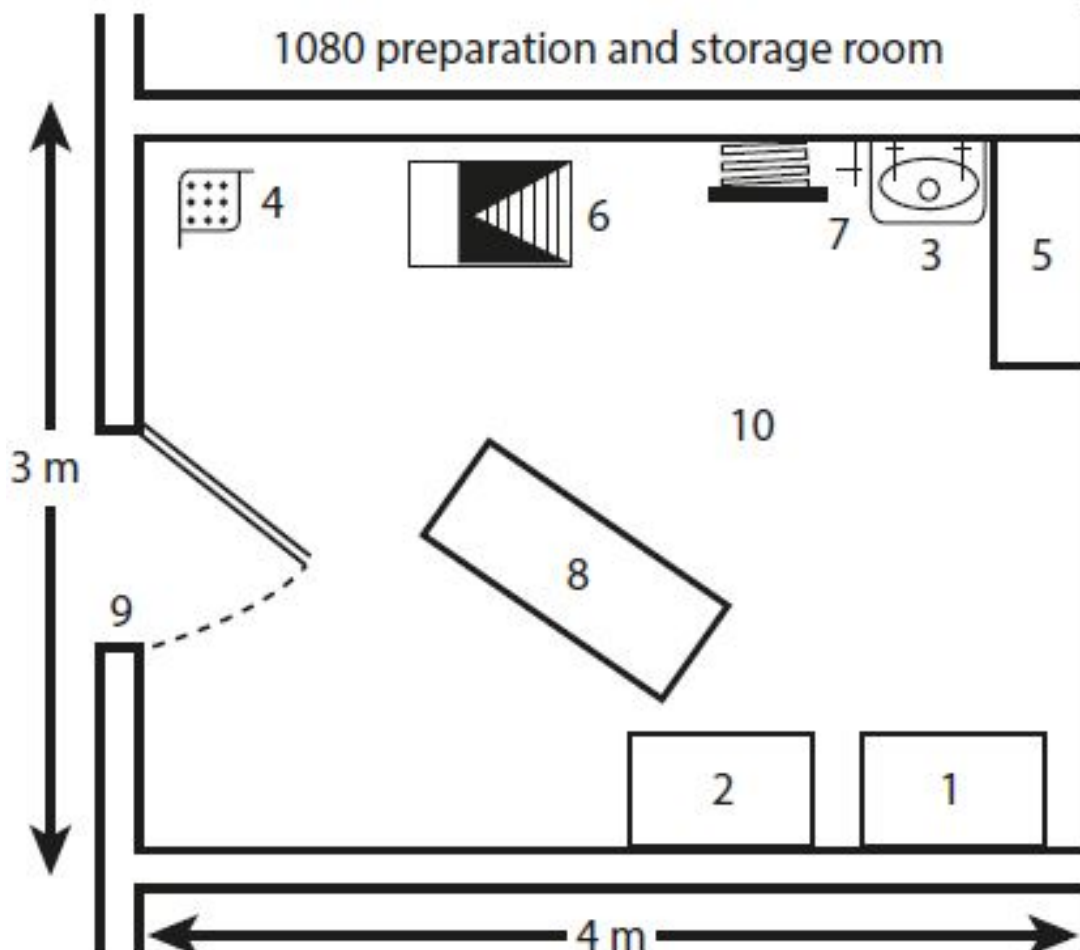
Facility

The bait preparation area must meet the following conditions:

- Bunded or appropriately sloped impervious floor, drained for effective washing down into a dilution pit or septic system. The dilution pit or septic system, of at least 50 L capacity, must be accessible for sampling. All liquid waste must be able to be held for at least one hour if it enters a sewerage system unless approvals have been received from the relevant authority for liquid waste to flow directly into the sewerage system.
- Drain must be sealable and closed off at all times other than when the equipment or the area is being hosed down.
- Sealed floor that must be able to contain the total volume of concentrate in use if the entire contents were spilled.
- Drainage of waste, rinsate and wash down from each facility, whether into a septic or sewerage system, is regulated by local government. Contact the relevant council for the requirements for waste disposal systems.

-
- Labelled equipment used for measuring and handling pesticides must be thoroughly rinsed and cleaned and securely stored in an area only accessible by an ACO. All equipment used for mixing 1080 bait and preparing ejector capsules must be clearly labelled '1080 Poison' in large red lettering.
 - Hypodermic syringes and needles must be stored in a container that is labelled "1080 poison" in red and kept in the bait preparation area. Triple rinse syringes and needles if they are to be reused. Needles should be stored with their protective cover.
 - Adequate space for bait cutting and mixing machines, packaging of baits and temporary storage of poisoned baits awaiting distribution.
 - Tap with a hose for washing down the facility and equipment after bait has been prepared.
 - Provided with sink or hand basin with water facility
 - Absorbent material such as hydrated lime to soak up any major spillage.
 - Other people can access the facility to use bait cutting machines and to load bait if under the authorisation or supervision of the ACO.
 - Access to the 1080 locked safe or metal storage locker is ONLY permitted by an:
 - ACO
 - 1080 Supervisor
 - An authorised DPI Officer or
 - EPA or SafeWork NSW inspector.

Figure 2. Example of a facility for storage and bait preparation that will satisfy requirements.



1. Lockable 1080 storage locker.
2. Locker for gloves and respirator.
3. Hand basin.
4. Sealable floor drain into dilution pit or absorption pit.
5. Locker for plastic bags, etc.
6. Carrot cutter (optional).
7. Tap with hose.
8. Bait mixer (optional).
9. Lockable door.
10. Bund/spill containment.
11. Fire-fighting equipment.
12. First aid kit.
13. Spill kit.
14. Emergency shower and eye wash facilities.
15. Ventilation.
16. Ventilation above the mixing area.
17. Distance between the chemical storage and bund crest (600 mm distance).
18. Appropriate signage on the door.

Field preparation

Vertebrate pesticide baits may be prepared in the field providing the following conditions are met:

- A risk assessment for in-field bait preparation must be carried out by the ACO, this will provide a guide for burial of rinsate and signage requirements.
- Only ACOs are permitted to handle 1080 and pindone concentrate.
- All PPE as required such as washable hat, overalls, chemical apron, gloves, eye protection, respirator or duck mask, and plenty of water are taken to the site.
- The concentrate is transported in a sealed and locked metal or strong plastic box securely fixed to the vehicle, with appropriate signage.
- All bait preparation and mixing should be done over an impervious surface to ensure any spills, chaff or blood is contained for appropriate disposal.
- At the completion of bait preparation all equipment must be washed down before leaving the site. If practical rinsate should be drained into a burial pit. The burial site must be clear of permanent and ephemeral waterways to avoid pollution.
- Alternatively, all rinsate may be collected into a hard plastic container labelled “poison” in large red lettering and transported to the bait preparation facility for disposal.
- See Appendix E for a checklist that can be used to assist with meeting the record keeping requirements when completing pesticide usage and supply records.

Equipment for bait preparation

Preparing bait material for poisoning

When preparing bait material the ACO must ensure that no unauthorised person(s) are in close proximity to ensure their safety and the security of the concentrate being used.

Prior to bait preparation ensure plugs are in all drains to prevent any off-site spillage.

It may be appropriate to notify office staff that bait preparation is being undertaken and advisable to have a communication protocol in place.

PPE - Personal protection equipment

The minimum personal protection equipment to handle concentrate is:

- impervious gloves
- cotton overalls buttoned to the neck and wrists or chemical apron
- washable hat
- impervious footwear
- face shield or eye protection when injecting baits, and
- P2 dust mask when mixing dusty baits such as grain or pellets.

Equipment

Equipment must include:

- Towel, soap, or washing facilities.
- Plenty of clean water.
- Laboratory grade equipment is required whenever preparing baits or measuring concentrate. Laboratory grade equipment must be used as most domestic measures are inaccurate; some vary by up to 50 mL.
- A set of accurate digital scales that will measure with at least 1 g graduations.

Other equipment may be required depending on type of baiting and include:

- Injection gun, with 0.1 mL graduations. A plastic shield that fits behind the needle may be used to protect the user from splash back. The injector gun must be directly attached to a 120 mL or 200 mL bottle or via a clear plastic tube to a 1 L 1080 liquid concentrate bottle.
- Lab grade hypodermic syringes with 0.1 mL graduations and needles (for use when small amounts of meat bait is being prepared)
- Appropriate scales for weighing bait.
- Moree mixer or other suitable mixer (optional).
- Carrot cutter (optional).
- Draining racks for meat or offal baits (optional).

Figure 3. Injector guns set up to prepare meat baits (Rob Hunt).



Bait Colour

All 1080 liquid concentrate purchased from the distributor comes pre-mixed with a blue dye, so there is no need for an ACO to incorporate dye into baits. The reasons for dyeing baits are:

- the distinctive blue colouring readily identifies the bait as being poisoned with 1080
- scientific studies show that bait uptake by rabbits and pigs is not affected by normal quantities of dye being added, however the addition of dye reduces bait uptake by birds
- the dye readily indicates where 1080 liquid concentrate moves throughout the bait preparation and distribution process. This should assist ACOs to improve work practices and reduce contamination of clean work areas by 1080 liquid concentrate
- the dye indicates the efficiency of the 1080 bait mixing process.

When baiting is to be carried out in areas known to be populated by satin bower birds with a known attraction to the colour blue; a green dyed bait may be used. ACOs can add a yellow dye to the concentrate until it is a definite green.

Bait mixers

Used only for the preparation of rabbit, feral pig and rodent baits, bait mixers provide even mixing of poison concentrates with the product and protects the operator from exposure to the poison and dust from some grain and pellet products.

Many variations of bait mixers are in use in LLS bait facilities. Most however, will be similar in design to the original “Moree mixer” or drum mixer.

Moree mixer

The delivery method of the toxin can vary. The Moree mixer in its original form will have a hand pump fitted which allows liquid toxin to be delivered via spray nozzles. Alternatively, toxins in both liquid and powder form can be poured/tipped direct on to the bait during agitation. This method requires the lid of the mixer to have a safety system in place that prevents hand access to the drum during operation.

Mortar mixer

Mortar mixers are a cheaper option for use as a bait mixer and are readily available through hardware outlets such as Mitre 10 or Bunnings. As the name suggests, mortar mixers are designed for mixing pointing mortar and grout products. The beater action also makes them suitable for bait preparation. The top of mortar mixers is covered with a mesh lid with a safety cut-off leaving the product exposed during treatment. Mortar mixers have beaters that rotate horizontally at a lower speed than Moree mixers, therefore the potential for airborne dust is minimised.

Using the bait mixer

Wherever possible, baits should be prepared in a purpose designed facility, capable of containing spills. All mixers must have a cut-off switch on the lid and a safety system that prevents hand access to the mixer when in operation.

1. Load the mixer with the quantity of bait to be prepared. In most cases 20kg of carrot, grain or pellets will be the maximum load.
2. Secure an approved and correctly labelled bag to the chute of the mixer.
3. With the mixer switched on, apply the toxin via the appropriate method for the mixer being used.
4. Mix for a sufficient period of time to ensure even coverage of the toxin on the bait material.
5. Poisoned bait is removed via the chute at the bottom of the mixer into the poison bag.
6. Wash the mixer out with water and degreaser or detergent.

Figure 4. 1080 rabbit bait with poisoned and un-poisoned carrot (David Croft).



Figure 5. Moree drum mixer on the left and mortar mixer on the right (Mal Leeson)



Mixing in bags

When mixing carrot or grain in small quantities such as 10 kg, it can be mixed manually in an appropriately labelled bag or in a bag before placing in an appropriately labelled bag. Measure the required amount of grain or carrot and mix with the required amount of vertebrate pesticide (depending on species being targeted). Hand mixing should be undertaken using a primary (bag) and secondary (container) containment process in case bags split or fall open. This can be undertaken in the bait preparation room or in the field just prior to use.

Figure 6. An ACO preparing 1080 poisoned grain for feral pig control (Rob Hunt).



Vertebrate pesticide preparation

Application and mixing rates for RCP concentrates and bait material is detailed in Appendix F.

Preparation of meat baits for wild dogs and foxes

1080 bait types for wild dogs and foxes

Shelf stable baits

Shelf stable baits are available from manufacturers.

Fresh meat baits

Fresh meat baits for wild dogs and foxes are prepared locally by ACOs.

Types of boneless red meat that may be used as bait material may include but are not restricted to cattle, horse, deer, goat, sheep meat and kangaroo meat subject to NPWS approval or commercial availability.

The use of offal for wild dog and fox control includes tongue, liver and heart.

Meat baits should be as close to a cube shape as possible to ensure the poison is in the centre of the bait.

Meat baits should be drained to a point where a light skin has formed, and the bait is not leaking blood or fluid. Draining removes excess fluid that might otherwise leach out the 1080 liquid concentrate and cause it to collect in the bottom of the appropriately labelled plastic bag.

Meat baits cannot be dried beyond 70% on private land or 80% for National Parks of their minimum required weight as stated below.

If baits have not been picked up due to an unforeseen event, for example, the weather being unsuitable to lay baits the ACO can freeze baits for the purpose of disposal only.

Preparation of 1080 bait for wild dogs

Legislative requirements under the Pesticides Act for the preparation of 1080 wild dog baits are detailed in the current 1080 PCO under Schedule 5.

The wet mass for meat or offal should be approximately 250g.

Only the bait materials listed below may be used when preparing 1080 poisoned baits for wild dogs (for ground and aerial baiting):

- Boneless red meat (mammalian includes pork).
- Offal (heart, tongue, and liver).

Where possible all fresh poisoned baits should be used on the day of preparation. Baits must be used within 7 days. Fresh poisoned baits must be kept in the labelled plastic bag/container supplied by the ACO and must not be frozen. Poisoned baits must be stored in a lockable storage area away from children, animal food, foodstuffs, seed and fertiliser.

When determining the number of baits to be supplied to an authorised person (as defined in the PCO) the following conditions apply.

1. A risk assessment must be undertaken and part of this is to determine the area of the baiting location taking into consideration other requirements within the PCO such as distance restrictions.
2. Once the area of the baiting location is determined the maximum number of baits to be supplied must not exceed 1 bait per 5 ha. NB: the area of the baiting location may be less than the total area of the holding.

For further information on risk assessments and baiting procedures see Appendix G and K.

Preparation of 1080 bait for foxes

Legislative requirements under the Pesticides Act for the preparation of perishable 1080 fox baits are detailed in the current 1080 PCO under Schedule 5.

Only the bait materials listed below may be used when preparing 1080 poisoned baits for foxes. The minimum wet mass for boneless red meat or offal is 100 g.

- Boneless red meat (mammalian includes pork).
- Offal (beef tongue, heart and liver. An exemption applies for whole lamb tongue and whole lamb kidney, but they must weigh more than 70 g).
- Fowl heads.
- Chicken or turkey wingettes.
- Bird eggs (ground baiting only).
- Manufactured sausage.

The recommended poison injection sites for the various bait types are:

- Fowl heads – inject through the eye into the brain cavity.
- Tongue – inject into the fleshy underneath meat.
- Chicken or turkey wingettes – inject between the two major bones.
- Bird eggs – inject into the pointy end of bird eggs using a vaccinator gun. Seal the hole with paraffin wax, candle wax or similar and place in an egg carton with ‘1080 poison’ in large red letter. Each bird egg must be labelled ‘1080 poison’ in red lettering.

Refer to Appendix F for more details.

Preparation of 1080 capsules for Canid Pest Ejectors

Only ACOs who have successfully completed Ejector training as per the conditions of the 1080 Ejector Capsule PCO can prepare 1080 ejector capsules.

Preparation of poisoned baits for rabbits

1080

Legislative requirements under the Pesticides Act for the preparation of 1080 rabbit baits are detailed in the current 1080 PCO under Schedule 5.

Only the bait materials listed below may be used when preparing 1080 poisoned baits for rabbits:

- carrots (preferred)
- oats
- manufactured pellets.

Carrots are generally the most effective bait for rabbits, being used extensively throughout two-thirds of NSW, combining high acceptability with reasonable economy.

Cut carrots manually or in a carrot cutter before 1080 liquid concentrate is applied. The carrots should be cut with a swift, clean action. Avoid small chaffy pieces that dry quickly or large chunks that rabbits find hard to eat. Prior to treatment with 1080 and during free feeding carrots must be kept chilled. Rabbits can be fussy eaters and it is very important to present carrots in a fresh condition.

Although carrots are preferred, oat grain has certain advantages in dry seasons because it is readily available, suitable for storage, easier to handle and does not deteriorate or require processing. Pellets have similar advantages to oats.

Section 7 of Schedule 4 requires that a person must free feed rabbits on at least three occasions at intervals of at least two days to determine the amount of bait to be poisoned with 1080. The amount of bait to be poisoned is determined when there is a small amount (up to 10%) of the free feed remaining the morning after the free feed bait is laid. The amount of bait to be poisoned shall be no more than two thirds the amount used for the final free feed.

Pindone

The pindone product label and details below should be followed to ensure legislative requirements are met for the preparation of pindone bait.

Only the bait materials listed below may be used when preparing pindone poisoned baits for rabbits:

- carrots (preferred)
- oats.

Carrots are generally the most effective bait for rabbits, being used extensively throughout two-thirds of NSW, combining high acceptability with reasonable economy.

Cut carrots manually or in a carrot cutter before pindone concentrate is applied. The carrots should be cut with a swift, clean action. Avoid small chaffy pieces that dry quickly or large chunks that rabbits find hard to eat. Prior to treatment with pindone and during free feeding carrots must be kept chilled. Rabbits can be fussy eaters and it is very important to present carrots in a fresh condition

Although carrots are preferred, oat grain has certain advantages in dry seasons because it is readily available, suitable for storage, easier to handle and does not deteriorate or require processing.

Preparation of RHDV Products

Humans cannot contract Rabbit haemorrhagic disease (RHD) however allergic reactions may occur with some users of RHDV. When mixing the virus on oats or carrots, it is advisable to wear impermeable gloves and a full-face shield to reduce the opportunity for the foreign protein to contact skin, eyes, or mucous membranes.

Instructions for the preparation of RHDV treated baits are provided on the product label. Only carrots or oats may be treated with RHDV products. Oats should be intact oat grain with husks attached. Carrots should be of good quality and freshly diced.

The appropriate quantity of feed material is added to the mixer. The RHDV product should be reconstituted according to label instructions and the viral solution should then be added to the mixer, preferably through spray nozzles inside the drum. The bait and viral solution should be evenly mixed. The bait is then delivered directly into plastic bags, (labelled with Rabbit Haemorrhagic Disease Virus Suspension) which meet the specifications outlined in the current APVMA Permit.

Note: Baits must be used the day of inoculation.

Preparation of poisoned baits for feral pigs

Legislative requirements under the Pesticides Act for the preparation of 1080 feral pig baits are detailed in the current 1080 PCO under Schedule 5.

Only grain and manufactured pellets may be used when preparing 1080 poisoned baits for feral pigs (unless authorised by APVMA permit).

In some areas fruit and vegetables may increase bait acceptability and can be mixed with grain or pellets as attractants to a bait station during free feeding. Fruit and vegetables must not be poisoned. Other attractants like molasses can be mixed on grain to get pigs eating.

Grain is generally recommended and when soaked for 12 to 24 hours in water the swollen grain is more likely to be taken by feral pigs than dry grain. This needs to be well drained prior to poisoning. An alternate is to use cracked grain to soak that is more absorbent than whole grains. Oats is not a preferred grain for pig poisoning due to the hull on the grain that some pigs “husk” when eating, that increases likelihood of sub lethal dosing as the majority of the poison is in the hull. However, in some situation baiting with oats may be mandatory to prevent off target impact. For example, the current 1080 PCO allows for other 1080 bait material to be approved for use under an APVMA permit. If meat, offal or swill are to be used then DPI must also issue an approval under clause 71(2) of the *Stock Diseases Regulation 2009* before this can be done.

Feral pig approved delivery device assessment

Under the current 1080 PCO (Schedule 3) feral pig baiting using an approved delivery device allows for extended presentation of 1080 bait in the field. An approved delivery device (Appendix M) must demonstrate both target selectivity and effectiveness as a feral pig control device under closely monitored field conditions prior to endorsement.

A number of baiting methods can be used to increase target selectivity when baiting for feral pigs. Unless formally approved as a delivery device these methods must adhere to all conditions under the current PCO.

Field monitoring of a proposed delivery device for feral pig control

Innovation in delivery and presentation of bait types is regularly undertaken by those involved in pest animal management. In order to identify the level of target selectivity and effectiveness of these presentation methods the following conditions are considered to be the minimum requirements for assessment as an approved delivery device for feral pig control:

- The presentation device must contain free feed (un-poisoned) bait during the monitoring period.
- A minimum of 3 trial sites with 1 delivery device per site. Sites may be run concurrently or in sequence as resources allow. Sites should be a minimum of 2 km apart.
- A minimum field trial period per site of 30 days giving a total of 90 bait presentation nights across the 3 sites.
- Remote cameras capable of capturing attendance and behaviour of species at each individual site must be used. A suitable camera would have the capacity to take multiple rapid shots with no delay set between image captures and have less than one second response speed.
- Remote camera memory cards would require at least 16 gb of memory with regular checking of sites to ensure no blank periods where cards are full or batteries have discharged. Weekly checks will allow these conditions to be met and ensure free feed (un-poisoned) bait can be replenished.
- To ensure remote cameras capture images of both large and small non-target species, cameras must be positioned 3 m from delivery device and 1m above ground level. The delivery device should be centre of frame with camera positioned on a suitable tree or star picket.
- In order to be considered as an approved delivery device images from remote cameras must identify a consistent uptake of bait by feral pigs and low level presence/interest of non-target species.
- When summarising images to assess species attendance at a trial site the following applies. If a species comes in and out of camera frame and the interval of absence is less than 30 minutes it should be recorded as one species. If, however the interval of absence is greater than 30 minutes, or a different species enters frame then it should be recorded as a new species visit.

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- A report summarising the results of the proposed delivery device monitoring should be submitted to the Vertebrate Pesticide Training Committee (email: birgitte.verbeek@dpi.nsw.gov.au) for review.

1080 Felixer Cartridges

The Felixer is a set and leave infield device that uses rangefinder sensors to distinguish between target animals, cats and foxes, from non-target wildlife and humans. When target animals are positively distinguished the Felixer fires 1080, as a gel, onto the side of the target animal. 1080 is ingested when the animal grooms itself. The 1080 gel is stored in the Felixer in specifically designed cartridges (1080 Felixer cartridge).

Felixers armed with 1080 Felixer cartridges are undergoing evaluation under an APVMA research permit (PER80926).

Persons who are authorised to possess and use 1080 Felixer cartridges must adhere to the conditions detailed in the “Pesticide Control (1080 Felixer Cartridge Trial) Order 2019” and the APVMA research permit.

Containers and labelling of poisoned baits

Under the Regulations of the *Agricultural and Veterinary Chemicals Code Act 1994*, 1080 bait material must be supplied to the user in an approved container impervious to the poison and of sufficient strength to prevent leakage arising from the ordinary risks of handling and transport.

Each Schedule (condition 2.5) in the current 1080 PCO for the supply of baits by an ACO to an authorised user allows for manufactured 1080 bait product to be placed in an appropriately labelled plastic bag or a container from an appropriate registered 1080 pesticide product.

Suitable plastic bags are a minimum of 100 µm thick and are printed with the required labelling, as specified in the Schedules of the current 1080 PCO.

1080 ejector capsules must be supplied in containers that comply with Section 18(1) of the Agvet Code Regulations. Attached to the container must be a printed label as per the Schedule of the current 1080 Ejector Capsules PCO or any order that subsequently replaces this.

An ACO may only supply pindone baits in either an appropriately labelled plastic bag or in a container supplied by the manufacturer of registered bait products.

Suitable plastic bags are a minimum of 100 µm thick and printed with the appropriate approved label.

Buckets may be used for all 1080 baits. The PCO specifies high-density polyethylene or polypropylene Category 5 (HDPE) plastic, however in case where a suitable bucket in HDPE cannot be found polypropylene may be used as long as the bucket is strong and has a lid that can provide a secure seal. The appropriate label must be applied to the bucket. This can be a lithographed label or a water-proof sticker.

Buckets and lids which have been used to contain 1080 bait products must not be used for any other purpose. When the bucket is empty or at the end of any ground baiting program, the bucket and lid must be returned to an ACO for reuse or disposed of in accordance with condition 3.8 of the current 1080 PCO.

Where buckets are to be returned to an ACO for reuse, the buckets and lids must be triple rinsed or pressure rinsed, and rinsate must be:

- (a) buried on the property where the 1080 bait products were used, in a disposal pit covered with at least five hundred (500) mm of soil; or
- (b) disposed of within the 1080 storage and mixing facility.

Washing and cleaning procedures

Washing and cleaning: 1080 and pindone

As 1080 and pindone liquid concentrates are very soluble in water, all equipment, trays and benches must be cleaned by washing with plenty of cold water. All equipment should be thoroughly rinsed and allowed to drain. When washing down in the field, wastewater, bait and other waste should be buried in a pit or collected in a container marked 'poison' and returned to the 1080 facility for disposal. ACOs should wear impervious gloves, washable hat, overalls or apron and rubber boots while washing equipment that has been contaminated with 1080.

To safely remove the ACO's PPE, wash the gloves, remove the eye protection, hat and overalls then the gloves, then thoroughly wash hands and face with soap and water.

Washing and cleaning: RHDV

Equipment used to prepare the bait should be decontaminated and cleaned at the completion of bait preparation each day by rinsing with 0.5% sodium hypochlorite (bleach). Following this, rinse the bait mixer and utensils with water and allow to dry.

Accident and incident reporting

Following a risk assessment each pesticide storage facility should have an Emergency Plan that details steps to take in event of fire or other incident at the facility. The Emergency Plan may include:

1. Who to contact
2. Activation procedures
3. Evacuation procedure
4. Control and containment of spills and leaks
5. Fire-fighting procedures
6. Protection of persons engaged in emergency assistance
7. Assistance by emergency authorities such as police and fire brigade
8. Emergency contacts
9. A list of individuals and organisations to be provided with a copy of the emergency plan.

All incidents that require activation of the Emergency Plan procedures should be recorded and reported to the SafeWork NSW or other relevant authority.

Disposal of 1080 containers and unused bait

After triple rinsing break, crush or puncture and dispose of empty containers in local authority landfill. If no landfill is available, bury containers and rinsate below 500 mm of soil in a disposal pit specifically marked and set up for this purpose clear of water ways, desirable vegetation and tree roots. Empty containers may be burnt in an incinerator.

Disposal of pindone containers and unused bait

After triple rinsing break, crush or puncture and dispose of empty containers in local authority landfill. If no landfill is available, bury containers and rinsate below 500 mm of soil in a disposal pit specifically marked and set up for this purpose clear of water ways, desirable vegetation and tree roots. Empty containers should NOT be burnt.

Any bait that is uneaten four days after bait consumption ceases should be collected and destroyed either by incineration (where permitted) or burying at a depth of 500 mm of soil. Alternatively, trails of poisoned carrot or oat bait can be covered with sufficient soil to prevent non-targets from gaining access. Carcasses of poisoned rabbits should be collected for a

minimum of 12 days after the last application of poisoned bait. The carcasses should be destroyed by incineration (where permitted) or buried under 500 mm of soil in a disposal pit.

Disposal of RHDV vials and unused baits

Used vials should be soaked in 0.5% sodium hypochlorite, or 1 in 20 dilution of household bleach containing 10% sodium hypochlorite and water and buried in a local authority landfill or buried below 500 mm of soil in a disposal pit specifically marked and set up for this purpose. Empty vial containers and products should not be burnt. Unused bait and bags must be disposed of by deep burial.

Aerial baiting

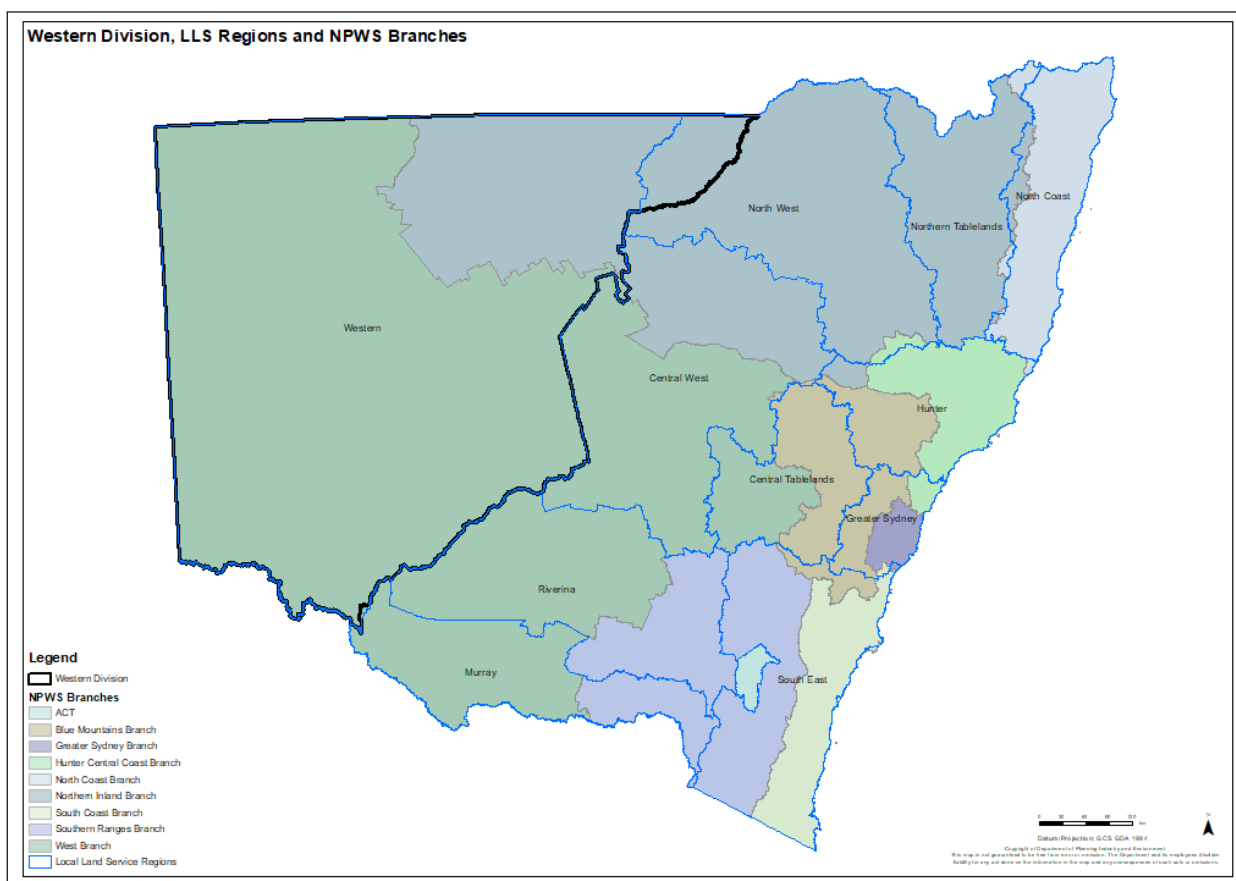
Aerial baiting is restricted to areas and situations that meet the restrictions stated in the LLS and NPWS approved guidelines/procedures for aerial baiting.

Written approvals to undertake aerial baiting are required as stipulated in the current 1080 PCO.

Aerial baiting is allowed in NSW where the conditions of the current PCO can be met.

Aerial baiting must only use bait types and rates as specified under the [Vertebrate pesticide preparation](#) heading above.

Figure 7. Map of NSW showing Western Division, LLS regions and NPWS branches



Issuing pesticide products and assessing risk

An ACO must undertake a risk assessment of the proposed programs with the persons authorised to use the baits. (see Appendix G and K)

Poisoned baits must be issued only after an approval by the ACO has been given and the occupier has received the relevant PCO and signed an Indemnity Form.

Indemnity versus consent forms

An indemnity is a legal document that passes on ownership and responsibility of vertebrate pesticides to the person taking possession – 1080 PCOs mandate the requirement for an indemnity to be completed and signed for each property being baited. A consent is a voluntary agreement that allows the authorised person to act on behalf of another.

Indemnity and Consent Forms must be kept for a minimum of three years so that they can be correlated with the vertebrate pesticide usage and supply record in case of legal action.

Indemnity Form – issuing pesticide baits to a private land manager

Before supplying 1080, pindone, PAPP, and RHDV bait or strychnine cloths, the ACO must get the person being supplied baits to sign an Indemnity Form that releases the LLS ACO and the LLS from any liability for accidental poisoning on the land manager's property. This also applies in situations where the ACO is employed by an approved government agency, Wild Dog Destruction Board or any other public authority that supplies baits to private land managers.

The ACO must explain to the person being supplied baits what is contained in the Indemnity Form and ensure that the person signing understands that it is a legal document. The Indemnity Form is either filled out by the person signing the form or they can request help filling out the form from the ACO or someone else. Once signed, a copy of the Indemnity Form must be provided to that person and a copy kept on file by the LLS or other public authority.

An ACO must only supply 1080 bait material to a person authorised, their nominated person or the authorised agent of the owner or occupier of the land on which the 1080 baits are to be used.

Written approval is required from the landholder or occupier for an authorised agent to lay baits on their behalf.

When supply of bait material is to another government agency the agency must provide written approval for the authorised agent. See Appendix L for ACO to ACO record of RCP transfer (external agency only).

A person who owns or occupies more than one property must complete a separate Indemnity Form for each property or program before any 1080 bait may be used on the specified property.

The minimum information that should appear on an LLS Indemnity Form is (for other government agencies refer to their own SOP):

- Name and contact information of the authority or agency issuing the baits
- Specify which pesticide the form relates to
- Name and address and chemical accreditation card number details of the person authorised to lay the baits and name of authorised agent if applicable
- Name of property where baits are to be laid
- An acknowledgement that the person has received the following information:
 1. A copy of the PCO and relevant Schedule relating to wild dogs, foxes, feral pigs and rabbits for 1080. Customise as required for other pesticides.
 2. The person has been advised that all baits must be laid in accordance with the label and PCO or permit as required.
 3. The person has been reminded that other requirements under the Pesticides Act such as record keeping must also be complied with
- Details of the notification process that has been carried out
- Acknowledgement of amount and type of bait material received, for which pest species for use on stated property

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- Acknowledgement of amount of signage received to identify baiting location and the area being baited in hectares
 - A statement indemnifying the authority or agency
 - Section for the authorised person or agent and officer of the authority or agency to sign and date.

Consent Form – baiting at the request of a land manager

Where an ACO is undertaking the baiting on behalf of a landowner, occupier or manager, a consent form must be completed by the owner, occupier or manager and a copy provided to the ACO.

Authorisation Form

All persons taking possession of 1080, pindone, PAPP, RHDV bait or strychnine cloths on behalf of another landholder, as their authorised agent, must provide evidence to the ACO of the authorisation given to them by the landholder whose property is being baited. The authorisation must not cover a period of time greater than 12 months.

Supplying bait to authorised persons

Supplying 1080 and pindone baits

An ACO must only supply or give approval to supply baits to a person who is an authorised user or their agent.

For RCPs, an authorised user is defined in the relevant PCO.

A person taking possession of 1080 baits must first complete and sign an Indemnity Form for each property or NPWS Regional Pest Management Strategy program on which baits are to be used.

When an ACO is supplying 1080 prepared or manufactured baits to another ACO only the ACO who is taking possession of the 1080 prepared or manufactured baits needs to have completed a risk assessment for the program being undertaken. For example, when an LLS ACO supplies baits to a NPWS ACO the NPWS ACO will be responsible for the risk assessment.

The conditions to supply pindone baits to an authorised person are the same as supplying 1080 baits.

A person taking possession of prepared pindone baits from an ACO must first complete an Indemnity Form for each property on which baits are to be used.

Supplying RHDV baits

ACOs may only supply baits inoculated with RHD virus to people who meet the criteria in the current Pesticide Control (Rabbit Haemorrhagic Disease Virus) Order 2017 (RHDV PCO).

A person taking possession of baits inoculated with RHD virus must receive or be given a copy of the current RHDV PCO, copy of the approved RHDV label with the relevant instructions on how to use the bait material or how to inject.

Vertebrate pesticide risk assessment guideline

An ACO must conduct a risk assessment to determine if it is appropriate to supply 1080 and PAPP baits to any person. Risk assessments should consider threats to non-target species particularly domestic dogs, human health and the environment.

ACOs must conduct a risk assessment of planned group baiting programs where baiting occurs less than the prescribed minimum distances provided in the current 1080 or PAPP PCO.

When issuing other vertebrate pesticides ACO's must consider if a risk assessment is relevant.

The following should be considered as a guideline only and is not an exhaustive list of risks that need to be considered when undertaking a baiting program. ACOs should consider any specific or local issues that may constitute a risk.

A risk assessment may assist to demonstrate that risks were appropriately assessed and recorded and that due diligence was exercised in relation to a vertebrate pest control program.

When undertaking a risk assessment, consider:

1. Can the requirements of the PCO or label be met? If not, then the program may not proceed.
2. Are there risks to human safety? Assess the risk and whether the program can proceed by minimising the risk to an acceptable level by, for instance, isolating with signage or fencing the area.
3. Are there risks to the environment (e.g. threatened, endangered or non-target species that are vulnerable or susceptible to 1080)? Assess the risk and whether the program can proceed by determining the measures acceptable to minimise the risk of baiting on the environment.
4. Are there risks to domestic livestock? Assess the risk and whether the program can proceed by considering methods of husbandry necessary to minimise the risk; such as removing grazing livestock from a paddock during a rabbit baiting program.
5. Are there risks to domestic pets? Assess the risk and whether the program can proceed by minimising the risk to an acceptable level. For instance, will domestic pets need to be restrained or caged during the baiting program?
6. Are there risks to working or guard dogs? Assess the risk and whether the program can proceed by minimising the risk to an acceptable level. For instance, will working or guard dogs need to be muzzled during the baiting program?
7. Are there other risks not mentioned or risks that may have adverse outcomes such as negative media coverage of the program? If so, manage risks appropriately.

A risk assessment template is provided in Appendix G. This template may be used as a guide to record each risk and the management controls used to mitigate or minimise the risk to acceptable levels. Where a Conservation Risk Assessment (CRA) has been undertaken and endorsed by an ACO such as for aerial baiting, there is no need for an additional risk assessment to be undertaken for that activity.

Under NPWS policy a CRA is not required for ground application as long as the risk is found to be low in the ACO risk assessment. Where the risk is assessed to be medium or high a CRA is required. In these instances, it should be noted that a CRA does not replace an ACO risk assessment unless:

- the CRA also addresses all non-target risks (particularly to domestic animals), risks to humans, risks to the environment
- and is endorsed by a NPWS ACO.

ACO to ACO transfer of RCP (LLS to other agency)

In order to maintain accurate Restricted Chemical Product (RCP) registers, transferring RCP's ACO to ACO (concentrate and baited products) must occur every time a transfer is done from LLS to another agency which employs ACOs.

LLS FARMS poison registers used by LLS do not have the ability to electronically link across Government agencies. Therefore, paper-based evidence must be used to record any transfer of RCP between agencies. For LLS, the table at Appendix L is the agreed template for this purpose. This table along with the "transfer of product outside authority" transaction recorded in FARMS provides sufficient evidence of RCP use/transfer during auditing.

Transfer of an RCP concentrate, prepared bait and manufactures bait

RCP concentrates (1080 solution, RHDV vials, pindone liquid etc.) and bait products can be transferred directly from an ACO to another ACO, regardless of agency. The concentrate or bait

product must be physically received by the receiving ACO. The receiving ACO must sign the LLS table Appendix L transfer record. Under no circumstances can the concentrate be received by or delivered to a person who is not an ACO.

Collection of concentrate or baited products by non-LLS ACO

When baited product is collected by an ACO from another agency, there is no requirement for the LLS ACO to complete an indemnity form. In this instance Appendix L is completed and signed by the receiving ACO as a LLS record of the transaction.

Note: The RCP concentrate used in the manufacture of baits is transferred from the LLS ACO register via a **transfer of product outside authority** ACO to ACO in the FARMS register (see figure 7 below).

Upon receiving the concentrate/product the non-LLS ACO will enter the concentrate or baited product into their respective agency register for the relevant storage location.

All ACO to ACO transfers must occur in person

Risk assessments

LLS Risk Assessments (RA) are not required when RCP or baited products are received by an ACO from another agency i.e. ACO to ACO transfer. Other agencies have an agreed agency RA process that is undertaken prior to the placement of any bait product on their estate. LLS ACOs can contribute to the risk assessment process if their input will improve the overall quality of the assessment.

Indemnity form

LLS indemnity forms are not required when RCP concentrate, or baited product(s) are transferred from ACO to ACO. Other agency ACOs have agreed internal indemnity processes which meets the PCO requirements for ACOs to issue bait to their end users.

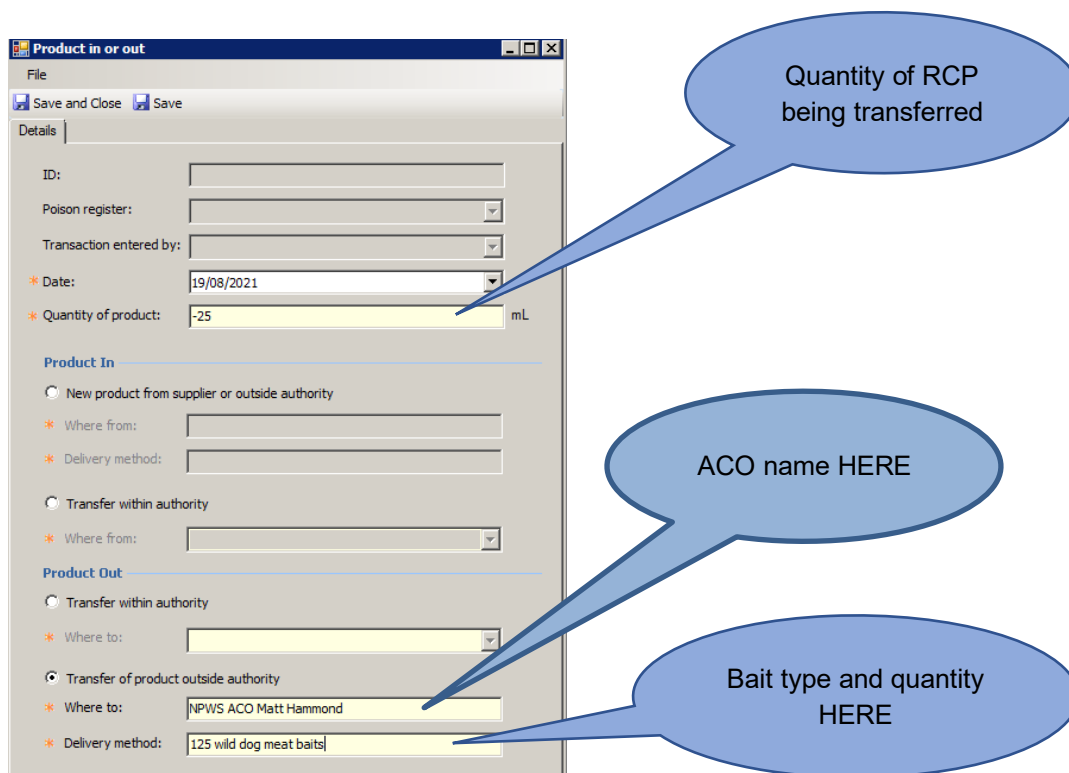
Procedural steps - RCP concentrate transfer (ACO to ACO)

1. LLS ACO populates the LLS RCP transfer record (Appendix L) according to the RCP type and other agency ACO receiving the RCP
2. Other agency ACO signs transfer record
3. Other agency ACO physically receives RCP concentrate from LLS ACO
4. LLS ACO finalises the process by updating the relevant RCP FARMS register. The method is a “transfer of product outside authority”.

Procedural steps - baited product transfer and recording of RCP use

1. Request to prepare bait product is received (minimum 3 days’ notice) from NPWS ACO/staff
2. Bait is prepared by the LLS ACO
3. Other ACO arrive to collect bait product:
 - a) LLS ACO populates the LLS RCP transfer record (Appendix L) according to the RCP used, bait prepared and person receiving the bait
 - b) Physical handover of bait product
 - c) LLS ACO finalises the process by updating the relevant concentrate FARMS register. The method is a “transfer of product outside authority” as per the below screenshot example.

Figure 8. FARMS register screenshot (ACO to ACO transfer only)



Toxicity

Toxicity is the degree to which a substance can damage an organism. Most substances are toxic under some circumstances. When the amount of toxin exceeds the body's ability to excrete or inactivate it there is a risk to health.

Users of poisons must have an understanding of toxicity:

- for their safety
- to control the target pest economically
- to minimise the risk to non-target animals.

The toxicity of a poison varies with the:

- species
- weight, age and health of the animal
- method of administration. Poisons are, generally, more toxic when ingested than when applied to the skin.

Measuring toxicity

Toxicity is measured by use of the lethal dose for 50% of a group of test animals under experimental conditions and is known as the LD₅₀.

Lethal dose, 50% (LD₅₀)

The Lethal Dose 50% (LD₅₀) is the amount of the active ingredient of a formulation of poison, expressed in milligrams per kilogram (mg/kg) live weight that will kill 50% of a group of animals of one species under experimental conditions. The LD₅₀ of a poison is used to compare different poisons and the effect of one poison on different animal species. The lower the LD₅₀ the more susceptible the species is to the poison.

The LD₅₀ benchmark is used as there are always individual animals of the one species that are more tolerant to a poison and this tolerance of one animal in a test group may skew the results of the average toxic dose for the rest of the group. This means that LD₅₀ is not the lethal dose for all subjects; some may be killed by much less, while others survive doses higher than the LD₅₀. Appendix I shows the LD₅₀ for a range of species to 1080. Note the comparatively low LD₅₀ for dogs, foxes and cats.

Absolute lethal dose (LD₁₀₀)

The Lethal Dose 100% (LD₁₀₀) is the amount of active ingredient of a formulation of poison, in milligrams per kilogram (mg/kg) live weight that will kill 100% of a large group of animals of one species. The LD₁₀₀ is more difficult to determine because there are always individual animals that are more tolerant to a poison. So, an LD₁₀₀ figure will depend on the number of highly tolerant animals in a test group and the sample size needs to be very large.

Application of lethal dose rates

The LD₅₀ rate is the main method to determine the toxicity of a poison however it is not the amount of poison applied to pest animal baits.

The aim of a baiting program is to kill all the target animals that consume bait. For example, the LD₅₀ of 1080 for wild dogs is 0.1 mg/kg. Therefore, 1 mg of 1080 will kill 50% of wild dogs weighing 10 kg and 3 mg of 1080 will kill 50% of wild dogs weighing 30 kg.

To ensure that the largest, most tolerant wild dogs die from eating baits poisoned with 1080 and to account for seepage and microbial breakdown in the environment, 6 mg of 1080 or 0.2 mL 1080 liquid concentrate is injected into wild dog baits.

Acute and chronic poisoning

Acute poisoning occurs when a poison is administered with a single lethal dose, e.g. a rabbit suffers acute poisoning by eating an adequate amount of 1080 carrot bait.

Most vertebrate pest poisons are acute poisons.

The acute or immediate toxicity of a pesticide is reflected in the Poisons Schedule or poison warnings, which appear on the label.

Chronic poisoning occurs when poisons are administered in smaller doses that have a cumulative effect that causes death such as pindone.

First and second generation anticoagulants

First generation anticoagulants require multiple feeds to deliver a lethal dose whilst second generation anticoagulants are more toxic and persistent and generally only require one feed to consume a lethal dose. Second generation anticoagulants may pose a greater secondary poisoning risk due to its persistence in carcasses.

Primary and secondary poisoning

Primary poisoning occurs when the target animal consumes a toxic substance. For example, a rabbit suffers primary poisoning by eating 1080 poisoned carrot bait.

Secondary poisoning refers to one animal being poisoned after consuming the flesh or regurgitated material of another animal which has digested the poison such as when a carnivore consumes the carcass of a poisoned animal or poisoned animal vomit.

The pesticide 1080 may persist in the muscle tissue and stomach contents of poisoned animals long after death. Because most canids are highly susceptible to 1080 poison, it is highly likely that sufficient poison remains in the carcass of a poisoned rabbit to cause the death of a working dog.

Secondary poisoning may be a significant risk factor to working dogs and domestic pets immediately after a baiting program and may remain a threat longer in cold or dry conditions that slow down the breakdown of pesticide residues.

The 1080 PCO requires users cover or collect all uneaten bait material and poisoned carcasses and to dispose of them by deep burial to reduce the risk of secondary poisoning of non-target animals.

Birds of prey and other avian scavengers can also be poisoned by invertebrate pesticides such as 1080. However, they are significantly less susceptible to 1080 than target species; because of this they infrequently consume enough carcasses to be fatal. Avian fatalities are more likely to occur with a pesticide such as pindone which has a cumulative affect over time.

1080

1080 is a S7 (Dangerous Poison) used to control wild dogs, foxes, rabbits and feral pigs. It was discovered by Belgian researchers in 1896 and was first used around 1944 as a rodenticide in the United States. It was introduced into Australia for rabbit control programs in the early 1950s.

1080 is the synthetic form of sodium fluoroacetate – the chemical occurs naturally in 41 species of the family Fabaceae including 39 species of *Gastrolobium* and two species of *Acacia*. These species grow in Western Australia, across northern Australia in the Northern Territory and in central Queensland.

1080 Physical and chemical properties

In its pure form, 1080 is a synthesised organofluorine compound that is stable in the absence of water. It is an odourless white powder that is highly soluble in water. It produces a clear solution when mixed with water. Commercial 1080 liquid concentrate contains 1 part 1080 powder to 30 parts of water. A dark blue dye is added to distinguish the resulting solution from water. 1080 liquid concentrate is not soluble in organic solvents such as fats or oils. It becomes unstable above about 110°C and decomposes at about 200°C. Once in solution, 1080 is readily degraded in the environment by microbial action.

1080 Mode of action

1080 can be absorbed through the stomach, intestines, lungs, mucous membranes, eyes and open cuts. It is not readily absorbed through healthy skin. 1080 acts by disrupting the 'Krebs cycle', the complex metabolic pathway in the mitochondria that breaks down food providing glucose and energy for cells to function. Once the energy reserves are depleted, death occurs fairly quickly from heart or respiratory failure. Cardiac failure is the most common cause of death in herbivores poisoned by 1080. Carnivores experience central nervous system disturbances and convulsions as their energy supplies are exhausted, eventually leading to respiratory failure. In omnivores, death tends to result from disturbances of both the heart and central nervous system.

The heart, brain and lungs are organs significantly affected by 1080 due to their high energy usage. The diaphragm is also affected.

Death usually occurs within 4 to 24 hours after ingestion of a lethal dose of 1080 poison. Animals that eat sub-lethal doses of 1080 may show mild signs of poisoning, but the 1080 is metabolised and excreted within one to four days and the animal recovers. All traces of 1080 are excreted within one week.

There is no known antidote for a lethal dose of 1080. However, some animals seen ingesting 1080 baits may be saved so emergency action should be taken if 1080 poisoning is suspected. See Appendix H for further details.

Advantages of 1080 as a poison

- Cost – 1080 poison is relatively cheap. This is important for cost-effective vertebrate pest control and in removing any temptation for unscrupulous people to seek less acceptable 'home-made' alternatives.
- Convenience – 1080 bait products are easily prepared and the clean-up process is quick, safe and efficient.
- Availability – Currently 1080 is the predominate pesticide used in wild dog, feral pig, wild rabbit and fox control as there are limited alternative pesticides available in NSW.

Species sensitivity and susceptibility to 1080

Species vary widely in their sensitivity to 1080. The susceptibility of different animals during 1080 poisoning programs depends on the amount of 1080 consumed and the body size of the animal. Carnivores, especially dogs and foxes, are the most sensitive to 1080 poisoning, followed by herbivores, with birds and reptiles less sensitive. Introduced species are generally more sensitive than native wildlife.

More information on susceptibility of a range of animals is available in Appendix I.

Environmental fate of 1080

Studies, both in Australia and New Zealand demonstrated that 1080 is rapidly degraded by microbial action. Degradation occurs by enzymes defluorinating fluoroacetate. The rate of detoxification in baits depends on:

- bait type
- placement of baits, such as buried or exposed on the surface
- soil temperature and moisture
- microbial action.

In laboratory experiments, the amount of 1080 remaining in soils was reduced to 50% after 10 days at 23°C, 30 days at 10°C and 80 days at 5°C. Leaching experiments in soil showed that traces of 1080 might be leached through soil, particularly if heavy rainfall occurred shortly after 1080 was applied.

Most soils can be expected to contain micro-organisms such as *Pseudomonas*, *Fusarium* and *Penicillium* capable of degrading 1080. This means that residues of 1080 that leaches from baits or carcasses should have little persistence in soils. The loss of 1080 from distributed baits by leaching or microbial degradation is highly variable depending on bait type and environmental factors, but most baits have low toxicity after several weeks in the field.

Breakdown of 1080 residues occurs rapidly in water. At 21°C, micro-organisms in water degrade 1080 in two to six days. At lower temperatures, microbial action is slower and degradation may take two weeks, or longer, at temperatures below 7°C.

1080 is also rapidly diluted in water. This dilution effect, especially in flowing water, quickly reduces the level of 1080 to insignificant concentrations compared to the time taken by micro-organisms in the water.

The 1080 in CPE ejector capsule is likely to remain viable for a number of years due to the capsules being sealed, providing limited opportunity for degradation of 1080 due to lack of contact with soil or water

1080: Minimising the risk to non-target animals

Differences in susceptibility to 1080 between species means that application rates can be varied to kill target species whilst minimising the risk to others. For example, a single poisoned bait prepared to kill a fox will not kill a Wedge-tailed eagle.

Differences in dietary preferences between species can be exploited by selecting bait substrates that are more attractive to target species and less attractive to non-target species.

Bait placement strategies can utilise feeding behaviours between species such as burying baits for wild dogs and foxes to make baits less available to non-target species. Risk reduction strategies to minimise ingestion by non-target animals include:

- monitoring bait sites prior to baiting programs for non-target species activity
- using the most appropriate bait size
- using the most appropriate type of bait material
- burying, tying down and dyeing baits
- injecting liquid concentrate into the centre of freshly prepared meat baits
- making baits attractive to pest species only
- using fencing or bait stations that exclude non-target animals from bait sites
- using CPE ejectors as they require an animal to possess sufficient strength to exert an upward pull force to be activated and cannot be cached or moved
- timing bait placement when pest species are most vulnerable and non-target animals are least vulnerable
- using pulse baiting to reduce the opportunity for multiple bait take and caching by an individual animal, particularly predators such as foxes.

Note: The non-target animals most at risk from 1080 poisoning are domestic dogs.

See Appendix H – First aid for working dogs and other domestic animals.

Applying 1080 baits

Distance restrictions

Minimum distances for laying 1080 baits and 1080 ejector capsules have been established to minimise the risk to non-target animals particularly humans, domestic dogs and cats. If control is necessary in the areas excluded from baiting, other control methods must be used. Instructions relating to distance restrictions are contained in the current 1080 PCO.

Public notification

Persons who use 1080 baits and 1080 ejector capsules on their own land or on public land are required to notify others before laying 1080 baits. The requirements for public notification are contained in the current 1080 PCO and it outlines who must be notified, how they are to be notified and when they are to be notified, before 1080 bait is laid. In addition to this, all public land managers must have and follow a PUNP.

1080 poisoning notices

Persons using 1080 must erect notices before laying baits and/or ejector capsules on any land. The notices must remain displayed for at least 4 weeks after the last day of baiting (meaning the last date baits were laid). Refer to the current 1080 PCO for details on where notices must be placed.

Notices must specify the following:

- that 1080 (wild dog, fox, feral pig or rabbit) baits and /or ejector capsules are laid on this property, and
- the dates on which 1080 (wild dog, fox, feral pig or rabbit) baits and /or ejector capsules are first laid or the dates between which baits will be laid, and
- contact details of a person that can be contacted to get details on the baiting program, and
- a warning that domestic animals may be affected.

Authorities must keep adequate supplies of these notices for each animal species. Notices for ejector capsules should specify ejector capsules as opposed to baits. Where both baits and ejector capsules are being used, notices are required to mention both.

The following are the recommended specifications for the notices.

Size and materials

- 253 gsm white System board (cardboard) or a similar synthetic Corflute® of approximately 40 cm × 30 cm (A3 Size).

Lettering

- Lettering is to be in red or a colour that contrasts with the background:
 - about 5 cm or larger for the words '1080'
 - 3 cm or larger for the words 'RABBIT', 'WILD DOG', 'FOX' or 'FERAL PIG' 'POISON',
 - 2 cm or larger for the words 'LAID ON THIS PROPERTY' (or Area); and
 - about 1 cm high for the words 'DATE POISON LAID / / '. The date can be written in permanent marking pen.
 - Warning - domestic animals may be affected.

Figure 9. A 1080 poisoning notice that shows the recommended style and layout for NPWS on far left (Grant Eccles) and LLS in the middle and on the far right (Dean Chamberlain, Mal Leeson).



First Aid: Specific recommendations for 1080

In all cases seek immediate advice from the Poisons Information Centre (131 126) or a doctor and get the affected person to a doctor or emergency centre as soon as possible.

The following information is taken from the relevant SDS.

- 1080 is a dangerous poison. Prompt treatment is vital whenever contact is made with this product
- Seek immediate medical assistance and transport to hospital. If ingested DO NOT induce vomiting; if conscious get patient to drink large quantities of water if medical treatment is delayed
- If chemical enters the eye, hold eye open and run under water for at least 15mins
- Do not attempt to remove contact lenses unless trained to do so
- If skin contact occurs, remove contaminated clothing immediately and wash skin thoroughly with soap and water. Transport to hospital or doctor if skin irritation develops. This risk is minimal as the product is supplied as an aqueous concentrate.

For medical practitioners.

The standard references for doctors (not first aiders) are:

- Reigart & Roberts, Recognition & Management of Pesticide Poisonings, 5th ed. 1999
- Poisons Information Centre 131 126.

PAPP

History

PAPP was originally studied as a treatment for cyanide poisoning but due to its high toxicity to dogs (*Canis* sp.) it has been evaluated as a potential agent for use against coyotes (*Canis latrans*) in the USA and more recently against a variety of mammalian predators in New Zealand and Australia.

PAPP Mode of action

Once ingested PAPP is transformed into an enzyme that rapidly oxidises haemoglobin (the protein which carries oxygen around your body) into methaemoglobin (which is not effective at carrying oxygen) in the blood. This lack of oxygen in the blood leads to loss of consciousness, and death due to respiratory failure.

Symptoms of methaemoglobinaemia are proportional to the concentration of the methaemoglobin in the blood. One of the first visible signs of the effect of increased levels of methaemoglobin in the blood is the pale bluish appearance of skin and mucus membranes. Death usually occurs within two hours of a lethal dose being ingested and animals become lethargic and sleepy before they die.

The effects of PAPP can be overcome by administering an agent that reduces methaemoglobin back to haemoglobin in the blood. The chemical methylene blue converts methaemoglobin back to haemoglobin and immediately reverses the effects of PAPP poisoning, with full recovery usually occurring within an hour. The antidote must be administered intravenously by a vet soon after the poison is taken and is most effective if given within 30 minutes.

Physical and chemical properties of PAPP

PAPP in its pure form is a yellow crystalline powder which has low solubility in water and many organic solvents. Commercially PAPP will be supplied in bait products containing 400 mg of PAPP in a 35 g fox bait (FOXECUTE Fox Bait®) and 1000 mg of PAPP in a 60 g wild dog bait (PAPP Wild Dog Bait®).

Species sensitivity and susceptibility to PAPP

Mammalian carnivores and monitors (*Varanus* sp.) are more susceptible to PAPP than other species. Birds tend to be less susceptible, although some species such as mallard ducks (*Anas platyrhynchos*) are adversely affected.

More information on susceptibility of a range of animals is available in Appendix I.

Advantages of PAPP as a poison

PAPP when delivered at a lethal dose causes a rapid increase in levels of methaemoglobin quickly leading to death with minimal symptoms of distress. Secondary poisoning is unlikely to occur due to the rapid degradation of PAPP and the low concentrations of PAPP in tissue of poisoned animals. One of the main advantages of PAPP is that it has a simple antidote that will reverse its effects.

Environmental Fate of PAPP

PAPP is readily broken down in the soil and water by microorganisms.

PAPP: Minimising risks to non-targets

Monitors, quolls, bandicoots and domestic dogs are at risk of poisoning and a risk assessment will specify control measures that must be put in place. The requirement to bury baits in holes approximately 8 cm deep is an example of how to minimise uptake by non-target species.

Notification of baiting program is required to minimise risk to domestic dogs. Whilst there is a means to reverse the effects if PAPP for dogs, people still need to be very vigilant. The reality is if a dog strays and takes a PAPP bait unless they can get the dog to the vet quickly (within 30 minutes most desirable) and the vet has the antidote methyl blue in stock it is highly likely the dog will die.

Investigation has occurred to have an antidote available for landholders to administer. However, nothing is available at this point in time.

Applying PAPP baits

Distance restrictions

Minimum distances for laying PAPP baits have been set to minimise the risk to non-target animals particularly humans, domestic dogs and cats. If control is necessary in the areas excluded from baiting, other control methods must be used. Instructions relating to distance restrictions are contained in the current PAPP PCO.

Public notification

Persons who use PAPP baits on their own land or on public land are required to notify others before laying PAPP baits. The requirements for public notification are contained in the current PAPP PCO and it outlines who must be notified, how they are to be notified and when they are to be notified, before PAPP bait is laid. In addition to this, all public land managers must have and follow a PUNP.

PAPP poisoning notices

Persons using PAPP must erect notices before laying baits on any land. The notices must remain displayed for at least 4 weeks after the last day of baiting. Refer to the current PAPP PCO for details on where notices must be placed. Notices must specify the following:

1. that PAPP (wild dog, fox) baits are laid on this property, and
2. the dates on which PAPP (wild dog, fox) baits are first laid or the dates between which baits will be laid, and
3. contact details of the person who will lay the PAPP or in the case of a public authority a person whom can be contacted for information and
4. a warning that the health of domestic animals may be affected.

Authorities must keep adequate supplies of these notices for each animal species. The following are the recommended specifications for the notices.

Size and materials

- 253 gsm white System board (cardboard) or a similar synthetic Corflute® of approximately 40 cm × 30 cm (A3 Size).

Lettering

- Lettering is to be in red or a colour that contrasts with the background:
 - about 5 cm high for the words 'PAPP' and
 - 3 cm high for the words 'WILD DOG' or 'FOX' 'POISON'
 - 2 cm or larger for the words 'LAID ON THIS PROPERTY' (or Area); and
 - about 1 cm high for the words 'DATE POISON LAID / / '. The date can be written in permanent marking pen.

-
- non-target animals including dogs may be affected.

See Figure 8 example for 1080 as a guide.

First Aid - specific recommendations for PAPP

Swallowed: Rinse mouth. Call Poisons Information Centre or transport to the hospital immediately. Do not induce vomiting unless advised by Poisons Information Centre or doctor. Apply artificial respiration if not breathing.

Eye: Hold eye(s) open and wash with running water for at least 15 minutes until product is removed. Ensure irrigation under the eyelids by occasionally lifting the eyelids. Transport to hospital or doctor immediately if eye irritation develops. Do not attempt to remove contact lenses unless trained.

Skin: If skin contact occurs, remove all contaminated clothing including footwear and wash skin thoroughly with soap and water. Transport to hospital or doctor if skin irritation develops.

Pindone

Pindone is a first-generation anticoagulant used to control rabbits in areas where distance restrictions and the impact on non-target animals and domestic pets make 1080 unsuitable. These include urban and closer settled semi-rural areas, golf courses, sporting fields and horticultural areas.

Pindone has a long history of use in Australia; the pindone acid formulation was introduced into Western Australia in 1984. Both pindone acid and pindone sodium formulations are registered in Australia for use as a vertebrate poison to control rabbits.

An advantage of pindone compared to 1080 is that there is an antidote for use where domestic animals may be exposed.

Anticoagulants have a low level of hazard to humans and domestic animals when used according to the label. Pindone should be considered where:

- rabbits are to be controlled in urban or closely settled areas and areas where 1080 is restricted from use
- the land manager objects to the use of 1080 and is willing to use pindone
- stock are required to be returned to a treated paddock soon after a control program.

Pindone physical and chemical properties

Pindone is a green synthetic chemical product available in both powder and liquid formulations containing either pindone acid or pindone sodium. The main difference between the two is that baits prepared from pindone sodium may be expected to lose the toxicant more rapidly under wet conditions because the sodium salt is water-soluble, whereas pindone acid is water insoluble. Pindone acid is mainly available in Western Australia.

There are several registered products containing pindone; ready-to-use bait products and pindone powder and liquid concentrates. While ready-to-use baits are available through rural merchants and some LLS, the liquid and powder concentrate products are restricted for use by ACOs.

Pindone concentrates typically used by ACOs are Pindone-25 Rabbit Bait Rodenticide® powder containing 2.5% pindone as a sodium salt in an inert base of caster sugar and corn starch or as RABBAIT Aqueous Pindone Concentrate® or ALDI Pindone 25 Liquid Concentrate®; the latter two also contain 2.5% Pindone as a sodium salt in solution.

Rabbits are generally more sensitive than other vertebrates to pindone. See Appendix I. Pindone is considered safer than 1080 however caution should be taken in areas to be baited that are

frequented by native wildlife as some raptors and kangaroos are highly sensitive to pindone. Strategies should be put in place to prevent access to pindone bait by non-target animals.

After ingestion with pindone rabbits will show signs of lethargy and anorexia followed by manifestations of haemorrhage including anaemia, laboured breathing, pale mucous membranes and weakness. Bleeding may be visible around the nose, mouth, eyes and anus and animals may pass bloody faeces.

Pindone Mode of action

Pindone is a cumulative poison and reduces the clotting ability of blood by disrupting the vitamin K cycle. Rabbits die from internal haemorrhaging within 24 hours to 24 days after the initial dose.

At least three applications of pindone poison bait are required at 3 – 5 day intervals to ensure rabbits receive a lethal dose. Few rabbit carcasses are seen after poisoning, because most rabbits die in the warren, but rabbits may be active in the treated area for many days after eating the poisoned bait. Where possible carcasses should be collected and disposed of according to the pindone label.

Symptoms of anticoagulant poisoning are:

- haemorrhaging and bruising
- anaemia
- listlessness
- general lethargy.

Species sensitivity and susceptibility to pindone

Rabbits are generally more sensitive than other vertebrates to pindone, see Appendix I. Some raptors appear to share the high sensitivity of rabbits, based on results for wedge-tailed eagles and brown goshawks. Kangaroos also appear highly sensitive, based on results for western greys.

It should be noted that while pindone is considered a safer option than 1080, extra care must be taken in areas to be baited that are frequented by native wildlife. Baits should be contained in bait stations that prevent access by animals larger than rabbits to reduce the risk to these non-target animals.

More information on susceptibility of a range of animals to pindone is available in Appendix I.

Environmental fate of pindone

Pindone is likely to dissipate slowly in baits, particularly under wet conditions. Small amounts may be leached from baits under wet conditions, but any residues entering soil would be expected to be degraded by bacteria in 5 – 6 weeks in moist sheltered areas and leaves no harmful residues. Pindone will breakdown under the ultra-violet light of sunlight in 2 – 3 weeks if left exposed.

Most of the pindone eaten by rabbits should be absorbed and metabolised within a few days. Based on the limited information available no significant or persistent contamination of the environment by both pindone formulations is expected from rabbit control operations using pindone baits.

Pindone baits are likely to pose minimal threat to aquatic organisms.

Pindone: Minimising the risk to non-target animals

Poisoning of non-target species can occur either directly by eating the carrot or oat baits intended for rabbits or through the tissues from a dead or dying poisoned animal. Although information on the toxicity and non-target impacts of pindone is limited, it is thought to be moderately toxic to a range of species.

Secondary poisoning may occur in species which feed on poisoned rabbits and carcasses such as quolls and raptors. Rabbits dying from pindone poisoning can become lethargic and less aware of their surroundings. This can predispose these animals to predation which can in turn place predators at greater risk from secondary poisoning. Non-target species that accidentally receive a high enough dose of pindone may exhibit the same clinical signs as rabbits.

Pindone is slow acting, so accidental poisoning of stock or companion animals may be treated with vitamin K1 to be administered by a veterinarian.

To minimise the potential for toxic baits to be lethal to non-target animals, the following baiting strategies are recommended:

- Starting with unpoisoned bait – allows an assessment of what animals are eating the bait.
- Bait type – use of surface coated rather than vacuum impregnated oat baits may reduce exposure of grain eating birds to the toxin. These birds may eat the kernel and discard the poisoned husk.
- Colouring of baits – pindone baits are dyed green in colour to reduce exposure to birds.
- Use of bait stations – bait should be placed under mesh canopies where it is accessible to rabbits but access by non-target species such as kangaroos and wallabies is restricted.
- Placement of bait – poisoned bait may be broadcast instead of concentrated in a trail, to decrease the consumption of poisoned bait by non-target species. Poisoned bait should be placed in the prime feeding areas of rabbits.
- Timing of baiting – rabbits mostly feed at night, therefore bait laid in the evening will be mostly consumed overnight before non-target species such as birds will have access. However, nocturnal mammals will be at risk when bait is laid in the evening.
- Collection of uneaten baits and rabbit carcasses – any uneaten bait and poisoned rabbit carcasses are collected and either destroyed by incineration or buried.

Note: Where there is a significant risk of exposure to non-target animals, measures must be taken to reduce this risk, or bait should not be laid.

Applying pindone baits

Persons applying pindone bait material must do so in accordance with the current Pindone PCO and the pindone pesticide label. Persons receiving ACO prepared bait must be supplied with the LLS Pindone directions for use before being issued baits.

The Pindone PCO direction for use and label gives detailed information on but is not limited to general restrictions of use, distance restrictions and public notification.

First Aid – specific recommendations for pindone

Swallowed: If swallowed contact medical assistance and transport to a hospital or doctor immediately. Effects are cumulative and delayed.

Eye: Hold eye(s) open and wash with running water for at least 15 minutes until product is removed. Ensure irrigation under the eyelids by occasionally lifting the eyelids. Transport to hospital or doctor immediately if eye irritation develops. Do not attempt to remove contact lenses unless trained.

Skin: If skin contact occurs, remove all contaminated clothing including footwear and wash skin thoroughly with soap and water. Transport to hospital or doctor if skin irritation develops.

Inhalation of Powder: Remove victim to fresh air. If breathing has stopped, ensure the airway is clear and apply resuscitation. If breathing is shallow apply oxygen if available. Transport to hospital or doctor immediately.

Advice to doctor: Vitamin K1 (phytonenadione) is an antidote if the patient shows signs of bleeding or haemorrhage.

Sodium nitrite

History

Sodium nitrite is a simple chemical compound that is used at very low concentrations, worldwide, as a preservative for processed meats to control the growth of microorganisms. It is also used to preserve the colour and flavour of meat. Sodium nitrite also occurs naturally in some common fruit and vegetables.

Mode of action

When ingested in higher doses sodium nitrite causes the conversion of normal haemoglobin in the blood to methaemoglobin effecting the transport of oxygen. Death occurs due to oxygen depletion in the brain and tissues. Affected animals lie down, become unconscious and die with limited outward symptoms.

Sodium nitrite physical and chemical properties

Sodium nitrite is an odourless, white, or slightly yellow solid. It is hygroscopic and very soluble in water.

Species sensitivity to sodium nitrite

Most animals can tolerate modest amounts of sodium nitrite however pigs are uniquely susceptible as they don't have the protective enzymes that are present in other species. Pigs that consume lethal doses of sodium nitrite succumb relatively quickly within 1 – 3 hours and are usually found within 200 m from where they consumed the bait (Hoggone®) containing sodium nitrite.

Advantages of sodium nitrite

Advantages of using sodium nitrite as a pig poison include:

- Sodium nitrite is not a restricted chemical
- Pigs die relatively quickly and humanely from sodium nitrite poisoning
- Residues of sodium nitrite in carcasses poses no risk to non-target scavenging animals
- There is an antidote for sodium nitrite poisoning – methylene blue.

Environmental fate of sodium nitrite

Sodium nitrite actively absorbs moisture. Once wet, it can readily breakdown via a range of reactions that generate aversive gases and other derivatives before oxidising to fertiliser (sodium nitrate). This means that degradation in the environment is total, and any partially degraded bait will be unpalatable to many animals, including pigs.

Brodifacoum

Brodifacoum is an Schedule 6 poison and it must be used in accordance with the product label.

Brodifacoum is a second-generation anticoagulant poison like bromadiolone. It is commonly available to the general public in retail stores in the form of pellets or wax blocks.

As a second-generation anticoagulant, brodifacoum usually requires only a single feed to deliver a lethal effect. APVMA minor use permits may be utilised to enable use of brodifacoum in the form of bait for bait stations or to be distributed with spreading equipment, on islands off the coast of NSW (by Lord Howe Island employees or contractors).

Rabbit haemorrhagic disease virus

Rabbit haemorrhagic disease (RHD), is an acutely acting, highly contagious viral disease which only affects the European wild rabbit *Oryctolagus cuniculus* and its domestic relatives. The virus was first reported in China in 1984 and rapidly spread across China and Europe. Subsequently it has also occurred in northern Africa, North America and on islands in the Indian Ocean. To date it has been reported in over 40 countries world-wide.

Two RHD virus types are present in Australia. RHDV1 was first registered as a biological control agent in Australia in 1996. It is now registered for use as a viral suspension that can be delivered via carrot or oat bait or through an injection of the product into a live rabbit.

RHDV2 was first identified in the Australian rabbit population in May 2015. RHDV2 first appeared in Europe in 2010. The disease process is the same as RHDV1, however RHDV2 is not species specific. It infects both European rabbits and a number of hare species; although its effectiveness in the European hare (*Lepus europaeus*), Australia's only hare species is unknown. It is not known how RHDV2 entered Australia.

RHDV1 is now prevalent in the majority of wild rabbit populations in Australia and high levels of immunity to the virus occur periodically. It is not recommended to release RHDV1 into a population of rabbits with high immunity.

The spread and impact of RHDV2 is under evaluation. Its ability to overcome antibodies to RHDV1 is unknown, however it appears it can overcome the protection provided by vaccinations for RHDV1 in some cases.

RHDV biological properties

RHDV comprises an RNA molecule, enclosed in a protein coating. Like all viruses, it reproduces only within the living cells of the host. The virus is harvested from laboratory rabbits that have been inoculated with the virus. The currently registered strain is designated CAPM V-351. Further research on other strains is ongoing.

RHDV mode of action

In most adult rabbits the disease progresses rapidly from fever and lethargy to sudden death within 48–72 hours of the time of infection. The virus replicates within the liver causing liver necrosis; this in turn leads to disseminated intravascular coagulation which creates micro-clots in vessels, which in turn uses up clotting factors and leads to generalised haemorrhage and death.

Effectiveness of RHDV

Rabbits infected with the virus develop the disease within one to three days. The virus is lethal in more than 75% of infected susceptible rabbits. Many juvenile rabbits have received maternal antibodies that are sufficient to provide partial or full protection from RHDV1 if exposed to the virus before about 12 weeks of age. Young rabbits that survive infection become immune adults. RHDV2 appears to be lethal to young rabbits; animals as young as 4 weeks.

Since its release in 1996, natural outbreaks of the RHDV1 continue to have variable effects on rabbit populations. This variability is due to many factors. One factor is that natural outbreaks do not always coincide with times when rabbit populations are most susceptible to the disease.

Secondly, some populations of rabbits in high rainfall areas have partial immunity to RHDV1 because they carry a benign strain of the virus, RCA-A1. The new K5 strain of RHDV1 was selected because it can overcome the protective effects of the benign virus. Because of the presence of RCA-A1 in the high rainfall, cool wet regions of the country the impact of RHDV1 CAPM V351 has generally been greatest in the arid and semi-arid zone.

The timing of RHDV spread is important. If an outbreak occurs early in spring when kittens are young, their exposure is less likely to be lethal and instead provide immunisation to the virus.

When outbreaks occur in autumn or winter the effectiveness of RHD is likely to be greater. Therefore, the optimum time to release RHDV into a susceptible rabbit population is early autumn.

RHDV: Minimising the risk to non-target animals

RHDV1 has not been known to infect or cause death to any other animal species in the wild apart from rabbits. All rabbits in Australia are derived from the European wild rabbit and are therefore potentially susceptible to infection. Farmed and pet rabbits should be vaccinated against RHDV1. Vaccinations are available from veterinary practitioners.

The vaccine currently available for use in Australia only offers partial protection against RHDV2 using a modified vaccination schedule (approved by the Australian Veterinary Association).

New vaccines have been developed in Europe, but they are not currently available in Australia.

Applying baits inoculated with RHD virus suspension

Persons applying bait materials inoculated with RHDV must do so in accordance with the current PCO for Rabbit Haemorrhagic Disease and the RHDV Lyophilised label.

General restrictions

Restrictions include:

- treated baits may only be administered to wild rabbits
- rabbits visibly affected by myxomatosis should not be baited
- baiting of rabbits older than 12 weeks is recommended
- decline of rabbit numbers can increase predation on critical populations of vulnerable or endangered native animals. Advice should be sought from State or Territory conservation agencies so that appropriate predator control measures can be implemented if necessary.

Free feeding

Rabbits should be free fed according to the label instructions. Free feeding should occur at least twice when using carrots and three times when using oats. Treated baits should be applied at a rate of 10% of the rate applied in the final night of free feeding.

First aid – specific recommendations for RHD virus

Thoroughly wash exposed skin with soapy water after preparing bait feed. If injected or an adverse reaction occurs, seek immediate medical advice.

Fumigants

DO NOT store fumigants in an airtight building. **DO NOT** transport fumigants in the cabin of a vehicle. All fumigants must be stored in well-ventilated areas and never opened in an enclosed space. Where possible, fumigants should be stored adjacent to a vent or metal grill that opens to the outside and the storage facility should be fitted with roof ventilators.

Phosphine

The main diffuse or static fumigant used in NSW is phosphine gas. Poisoning occurs by inhalation, although phosphine is highly toxic to humans and can kill if the tablets are swallowed or the liberated gas is inhaled. The gas is not readily absorbed through the skin. There are a number of registered phosphine tablet products available. Search the APVMA Pubcris database to see what products are currently available. <http://portal.apvma.gov.au/pubcris>

Phosphine physical and chemical properties

Phosphine is a colourless gas, about 20% heavier than air, with a slight garlic odour. Phosphine gas is generated when aluminium phosphide tablets are exposed to moisture in the air. It remains gaseous at ambient temperatures and spreads quickly. The gas can react with copper, compounds, silver and gold at high temperatures.

Tablets weigh 3 g and begin to emit phosphine immediately on exposure to moisture in the air. Complete decomposition takes about 48 to 72 hours depending on the humidity. Tablets come in tubes and packs with varying numbers ranging from 30 to 100 tablets.

Fumigation tablets contain 560 to 570 g/kg of aluminium phosphide which produces 330 g/kg phosphine gas. Each 3 g tablet releases 1 g of phosphine gas when exposed to moisture in the air or soil.

Phosphine mode of action

Phosphine is a systemic poison which depresses the central nervous system and respiratory function. It is highly toxic to humans; therefore, operators performing warren fumigation must take adequate precautions to safeguard against accidental exposure.

Time to death can be highly variable depending on the concentration of gas in the burrow. For example, at concentrations of 400 ppm phosphine can kill rabbits in 30 minutes whereas at 25 ppm death will take 4 hours. The time taken to reach high concentrations throughout the warren largely depends on the amount of moisture in the soil and air, or on the tablets. In low humidity, complete release of phosphine gas from the tablets may take hours or even days. Higher humidity will cause a rapid rate of diffusion and therefore result in higher concentrations of gas so that the rabbit will be exposed to a lethal dose in a shorter time and will have less chance to dig out of the burrow.

Sensitivity and susceptibility to phosphine gas

Phosphine is not species specific and is highly toxic to humans and animals.

For humans, the short term exposure limit is 0.3 ppm and concentrations of 50 ppm are immediately dangerous to health.

Environmental fate of phosphine

Aluminium phosphide will break down spontaneously in the presence of water to form a gaseous product, and so it is non-persistent and non-mobile in the soil environment and poses no risk to groundwater. It is highly unlikely that aluminium phosphide or phosphine will be found in surface waters. Phosphine decomposes in the atmosphere within 5–28 hours.

It should be noted that phosphine gas, when liberated by contact with moisture, can be toxic to fish and aquatic organisms, and every care should be taken to avoid contamination of aquatic environments.

Phosphine: Minimising the risk to non-target animals

Fumigation of rabbit warrens is one of the most target-specific means of rabbit destruction and will have little impact on non-target species if used correctly. Fumigation must only be used in active, occupied warrens. If a warren appears to be empty or possibly occupied by a non-target species (e.g. wombats, dingoes, lizards, snakes), fumigation must not be performed.

There appears to be no significant risk of secondary poisoning if carcasses of gassed animals are consumed by non-target predatory or scavenger species. If using dogs to work an area prior to warren fumigation, the following should be observed:

- Dog handlers must be experienced and the dogs well trained. The dogs must be easily controlled by a whistle or call and obey the handlers' commands
- Dogs must not chase or attack non-target animals including livestock

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- Dogs are not allowed access to treated warrens
 - To ensure that dogs are not exposed to phosphine gas or allowed access to treated warrens, handlers must ensure that dogs are well restrained during and after fumigation.

Using aluminium phosphide tablets – health and safety

- Operators must strictly follow the directions on the approved label when using and storing aluminium phosphide tablets. They must not be used for any other purpose than the destruction of rabbits in active warrens.
- Fumigation must always be carried out by two trained persons and must not be carried out in wet conditions when it is likely that the tablets will become wet before insertion in the burrows.
- As phosphine gas is heavier than air consider working from low areas to high rather than operating in areas where phosphine gas may pool.
- Consider purchasing phosphine tablets on-route to work site and using all phosphine tables in a canister at the worksite to reduce risk of storage and transport.
- Phosphine is highly toxic to humans and can kill if the tablets are swallowed or the liberated gas is inhaled. Avoid contacting the skin with aluminium phosphide or breathing phosphine gas.
- Symptoms of overexposure to phosphine gas include headache, dizziness, nausea, and difficulty breathing. Severe exposure may damage liver, kidneys, lungs, and nervous and circulatory systems, and may cause death.
- Appropriate PPE should be worn when using aluminium phosphide fumigants. This includes:
 - overalls
 - elbow length PVC or rubber gloves
 - full-face respirator with combined dust and gas cartridge (canister) or breathing apparatus with air supply. Cartridges should be changed after each day use.
- After use and before eating drinking or smoking, wash hands, arms and face with soap and water.
- After use, wash contaminated clothing and gloves.
- For further information refer to the SDS available from the supplier.

First Aid – specific recommendations for aluminium phosphide

If poisoning occurs, go to a doctor or hospital immediately.

If swallowed, rinse mouth thoroughly with water and contact the Poisons Information Centre on 131 126. Urgent hospital treatment is likely to be needed. Do NOT give mouth to mouth resuscitation if this product has been swallowed. If a patient has swallowed aluminium phosphide, they may begin emitting toxic phosphine gas. First aid and medical staff should take precautions against exposure to phosphine emitted by such a patient.

If eye irritation occurs flush the contaminated eye(s) with lukewarm, gently flowing water for 5 minutes or until the product is removed, while holding the eyelid(s) open. Obtain medical advice immediately. If irritation persists, repeat flushing and obtain medical advice. If any unusual symptoms become evident, or if in doubt, contact the Poisons Information Centre on 131 126 or a doctor.

If inhalation occurs seek medical assistance immediately. Remove source of contamination and move the patient to fresh air as soon as possible.

DO NOT administer mouth-to-mouth resuscitation – use other forms of resuscitation. DO NOT allow victim to move about unnecessarily. Symptoms of pulmonary oedema can be delayed up to 48 hours after exposure.

Chloropicrin

Chloropicrin is registered as a soil fumigant in Australia. It is considered inhumane for use as a vertebrate pest control option. It also carries significant work health and safety risks.

The EPA provides licences to fumigators that use chloropicrin. Exemptions apply to farmers who do not need a licence to apply chloropicrin fumigants in agriculture. (Note: agriculture includes horticulture, growing fruit or vegetables and the use of land for animal husbandry such as keeping or breeding livestock, poultry or bees.)

Carbon monoxide physical and chemical properties

Carbon monoxide is a colourless and odourless gas. Carbon monoxide is formed when DENCO-O-FUME® cartridge is ignited by the lighted fuse. The subsequent smoke is poisonous if inhaled. The smoke is non-irritating.

DEN-CO-FUME® cartridges weigh 240 g and contain 65% sodium nitrate and 35% charcoal. These cartridges are capable of producing concentrations of carbon monoxide up to 3% in a dead volume of 1000 litres (1 m³).

Carbon monoxide mode of action

When inhaled carbon monoxide combines with haemoglobin in red blood cells, with an affinity 250 times that of oxygen, to form carboxyhaemoglobin. This results in reduced oxygen-carrying capacity and reduced delivery of oxygen to cells. Hypoxia, the reduction of oxygen supply to the tissues, eventually leads to unconsciousness and death.

While exposure to very low levels of carbon monoxide may cause no symptoms or only slight headache and shortness of breath, longer exposure to higher concentrations of carbon monoxide will convert more than 50% of blood haemoglobin to carboxyhaemoglobin. Prolonged exposure to concentrations of carbon monoxide over 1000 ppm (0.1%) causes loss of consciousness, failure of the respiratory system followed by death. Death occurs without pain and while the animal is unconscious. Time to death depends on the final carbon monoxide concentration but is typically within minutes or a few hours at a concentration greater than 1%. Higher concentrations are achieved in smaller dens.

Sensitivity and susceptibility to carbon monoxide

Carbon monoxide is extremely hazardous to humans and is highly toxic to most mammals and difficult to detect. Species specificity is achieved from accurate identification of occupied fox natal dens. Effects may be rapid if exposed to high concentrations of carbon monoxide.

Environment fate of Carbon monoxide

Carbon monoxide is biologically degradable and will not accumulate in soil or water.

Carbon monoxide: Minimising the risk to non-target animals

Fumigation of occupied fox natal dens is very target-specific and will have little impact on non-target species if used correctly. To minimise the risk to non-target species, monitor the den to ensure other species are not using the den before fumigation is undertaken.

Using carbon monoxide fumigant cartridges and work health and safety

Operators must strictly follow the directions on the DENCO-O-FUME® label and SDS when using and storing carbon monoxide fumigant cartridges. This product must not be used for any purpose other than the fumigation of active fox natal dens.

Carbon monoxide is highly toxic to humans and can kill if the resulting smoke and gas is inhaled. It is essential to have adequate fresh air available to the operators during use of cartridges. Do not inhale smoke.

Appropriate personal protective equipment should be worn. This includes:

- protective gloves
- protective glasses
- respiratory protective equipment is recommended although in the SDS it is stated as not necessary when fumigation is conducted in the open air.

Manufacturer's recommended method of use:

Determine the location of active fox natal dens.

Before igniting, unwind the 50 cm fuse and open holes at the top of the cartridge around the inserted fuse. Using a broom handle or flexible hose establish that no animals are within 1.5 m of the entrance.

Place the cartridge, in the direction of the arrow, into the entrance of the active fox natal den. Bend the fuse back along the cartridge so it can be lit.

Ignite the fuse, confirm that the cartridge has ignited and seal the entrance to the den with earth. If smoke emerges from any other entrances attempt to seal these with earth also.

Do not disturb the den after fumigation.

Rates of application of carbon monoxide

When dens are in enlarged rabbit warrens with several entrances or of large volume it may be appropriate to use two cartridges. The total carbon monoxide concentration achieved with multiple cartridges is additive that is 2 cartridges produce up to 6% carbon monoxide.

First aid – specific recommendations for carbon monoxide

If poisoning with carbon monoxide occurs, immediately move person to fresh air, if safe to do so. Contact a doctor or Poisons Information Centre, Phone 131 126. Have the SDS or the product label with you.

Contents are poisonous if swallowed and may irritate the eyes, nose and throat. Once the Denco-O-Fume® cartridge is ignited it will burn vigorously until completely spent and is capable of causing severe burns to exposed skin and clothes.

Swallowed: Seek medical attention.

Eye: Flush thoroughly with copious amounts of running water. If symptoms persist, seek medical attention.

Skin: Remove contaminated clothing. Wash skin thoroughly with soap and water.

Inhaled: If headache or drowsiness occurs transfer victim from contaminated area to fresh air and give oxygen if available. If unconscious, give artificial respiration and get to a hospital or doctor quickly.

Strychnine

Use of strychnine treated cloths on traps should only be considered in extraordinary circumstances, and only used after undertaking and documenting a rigorous risk assessment process. There are significant work health safety and animal welfare issues associated with its use. It is not appropriate to use strychnine cloths as a response to decreasing budget allocations or other resource limitations. Use of strychnine is only permitted under a current APVMA permit.

Strychnine impregnated cloths may be used on rubber jawed traps for wild dog control when traps cannot be serviced daily. Trap-jaws are bound with strychnine-laced cloths to hasten death and prevent prolonged suffering.

Strychnine is extremely dangerous to both humans and wildlife. Even where circumstances suggest it may be appropriate, it must only be used provided the following requirements are met as a minimum:

- An ACO issuing strychnine must undertake a risk assessment covering humaneness considerations for both target and non-target species. This needs to include procedures to deal with animals captured which have not chewed the strychnine cloth.
- An ACO issuing strychnine must complete a Safe Work Methods Statement or Job Safety Analysis that covers work health safety requirements of not only the person setting strychnine traps but also members of the public or anyone else who may come into contact with strychnine if attempting to release animals from traps.
- PUNP requirements must be met where strychnine is to be used on public lands and must include;
 - Appropriate notification to all those who could be exposed, prior to the trapping program being undertaken
 - Appropriate signage throughout the course of the trapping program to ensure anyone in the area is aware of the issue/danger.

As identified in Appendix I the lower limit of strychnine LD₅₀ for a 70 kg human is 70 mg. The current APVMA Strychnine permit stipulates a dose rate of 1g (1000mg) for strychnine cloths with up to 2 cloths per trap. This is a potential presentation in the field of over 14 lethal human (70 kg) doses per single strychnine cloth. For comparison 1080 LD₅₀ for a 70 kg human is 140 mg with a fox bait containing just 3 mg of 1080 and a wild dog bait containing 6 mg of 1080.

Procedure for the use of strychnine cloths on wild dog traps in NSW

NSW DPI recommends that padded jaw traps are checked daily to maximise the effectiveness of programs, minimise stress of trapped animals and enable the safe release of non-target species. The use of strychnine on padded jaw traps is not a preferred option for wild dog control in NSW.

A 'strychnine cloth' is a strip of fabric wrapped around the jaw of a padded jaw trap to which strychnine is applied. When caught, the wild dog must chew on the cloth to receive a fatal dose of poison.

There are occasions when, for whatever reason, the dog does not chew the cloth, the cloth or wire attaching it unravels in the initial encounter with the trap or the strychnine is leached out with excessive rain and the poison is dispersed. For these reasons checking traps should be a daily requirement of any trapper.

A risk assessment must be undertaken and recorded to determine if the use of strychnine cloths on padded jaw traps is a suitable and safe strategy to control wild dogs in a particular location.

Operators using strychnine must strictly follow the directions on the current APVMA permit when preparing for use, using, storing or disposing of the pesticide.

Strychnine physical and chemical properties

Strychnine hydrochloride is the hydrochloride of the alkaloid strychnine, which is obtained from the seeds of *Strychnos nux-vomica* L. and other species of *Strychnos*. In its solid form strychnine hydrochloride is described as colourless prismatic crystals or a white crystalline powder, with an intensely bitter taste.

Strychnine mode of action

Strychnine is highly toxic and can enter the body and be rapidly absorbed through inhalation, ingestion and broken skin. Once absorbed, strychnine enters the blood stream and acts on the central nervous system, affecting the transmission of nerve impulses which control muscle contraction. Strychnine also causes an increase in the levels of glutamic acid in the brain. This can lead to the skeletal muscles becoming hyper excitable causing simultaneous muscle

contraction, convulsions and seizures which prevent respiration. Death generally results from suffocation or exhaustion. Fortunately, the kidney and liver work to eliminate the poison from the body and if a sub-lethal dose is taken, this inhibition is reversible.

Sensitivity and susceptibility to strychnine

Strychnine-sensitivity is fairly broad and it is therefore more difficult to achieve target specificity. Dogs are moderately susceptible to strychnine. Appendix I shows the susceptibility of different animals to strychnine.

Environmental fate of Strychnine

Strychnine shows little or no breakdown by exposure to light.

Strychnine can be degraded in some soils as a result of microbial activity. However, this degradation is generally very slow. Microbial degradation doesn't appear to occur in some instances because the strychnine gets bound to soil particles, a factor that is influenced by the soil pH.

Strychnine: Minimising the risk to non-target animals

Species other than canids may not gnaw at the jaws of the trap and so will be unlikely to be poisoned by contact with strychnine cloths. However, it should be noted that traps are not target specific, so a wide range of non-target species may be caught. These can include birds, kangaroos, wallabies, rabbits, hares, goannas, possums and sheep. If there is a high risk of trapping non-target animals, traps should not be set.

Storage and disposal of Strychnine

- All strychnine powder, strychnine cloths and mixing equipment must be stored in a locked metal cabinet and only the ACO who uses it is permitted access.
- All strychnine containers must have sufficient strength and be impermeable to prevent leakage of its contents and have a label that clearly identifies it as strychnine hydrochloride, a schedule 7 poison and have safety directions and first aid instructions.
- Containers that have held cloths are not to be used for any other purpose and must be disposed of by deep burial.
- Used cloths must be recovered and disposed of by deep burial.
- Do not contaminate dams, rivers, waterways or drains with the cloths or used containers.

Applying strychnine to the padded jaw trap

1. Check traps for wear and repair if necessary.
2. Wearing the correct PPE and using either a trap setting device or sufficient manual force, open the jaws and wedge open or clamp the springs to prevent the trap closing.
3. Position the trap so there is easy access to the jaw normally held under the dog or tongue of the trap. This jaw will be wrapped in the cloth.
4. Place strychnine pad on one jaw only (see Figure 9 below).
5. Cut hessian or similar coarse fabric into strips about 6.5 cm wide and 30 cm long for Lanes size traps or 20 cm long for Victor or similar sized traps and a 30 cm piece of soft wire.
6. Wrap the cloth strips in a bandaging pattern around one section of the held jaw, overlap the cloth by 50% as it wraps around the jaw.
7. Make 2 full wraps of the jaw.
8. Along the cloth place 1 g of strychnine crystals on, what is normally, the top surface of the jaw when the trap is closed.

9. Continue wrapping the jaw with the remaining length of cloth, making sure the area treated with strychnine is well covered.
10. Using a piece of soft wire, fasten the cloth pad at one end and starting on one side of the cloth pad, firmly wrap the wire several times around the jaw and pad. Make sure the wire cannot cause injury to a trapped animal.
11. Twist the wire underneath the jaw and cut off the excess. Repeat for the other end of the cloth pad, ensuring that the central 4 cm of the cloth pad is free of wire.
12. Ensure the wire is firmly attached and will not be ripped away before the dog chews on the soft wrapping, otherwise, the wrapping may be torn away and the wild dog may not ingest any poison.
13. As a precaution against strychnine loss through the cloth, some trappers may bind the finished strychnine pad with a thin wrap of electrical insulation tape.
14. Remove clamps, set and place the trap.

Figure 10. Strychnine cloth wrapping of a lanes trap and covered with electric tape



Minimum PPE for strychnine

Appropriate PPE must be used;

- Overalls buttoned to the wrist, boots and washable hat, use of chemically impervious gloves, a face mask or safety glasses, dust mask appropriate to inhalation risk with Class P1 particulate respirator or full-face class P3 particulate respirator.
- After use and before eating drinking or smoking, wash hands, arms and face with soap and water. Wash contaminated clothing and gloves.

For further information on strychnine refer to the SDS, available from the supplier.

First aid – specific recommendation for strychnine

Signs of poisoning include muscle rigidity, joint stiffness, muscle aches, weakness, headache, light sensitivity.

A low level of tolerance to strychnine appears to develop; however, repeated higher doses can lead to convulsions and other acute signs. Continual chronic exposure may ultimately cause severe incapacitation.

IF POISONING OCCURS IMMEDIATELY CALL 000 TO REQUEST AN AMBULANCE!

Call 131 126 for Poisons Information.

Remove any contaminated clothing from the patient.

Wash any affected skin thoroughly with free-flowing clean water.

Do not induce vomiting.

NOTHING should be administered to the patient by mouth.

Place the patient into the recovery position to ensure their airway remains clear. If the patient stops breathing only administer resuscitation if sure that there is no risk to the rescuer ingesting

the poison from the patient through mouth-to-mouth contact. A suitable barrier mask should be used if applying resuscitation.

Be aware that the patient may have convulsions.

Reassure the patient and keep them calm. If possible, keep the patient in a quiet dark place because they may be highly sensitive to noise and light.

Depending on circumstances either take the patient to doctor or hospital as soon as possible or if instructed wait for medical staff.

Make sure the strychnine product container, label and SDS is available to medical staff.

Transport of strychnine

Strychnine products and padded jaw traps with strychnine pads must be transported in a locked metal container firmly attached to a secured part of the vehicle and outside the cabin. Strychnine must never be transported with foodstuffs. Vehicles carrying poison must not be left unattended. Domestic animals must be separated from the poison. Placing the strychnine container in a small locked toolbox inside an anchored and locked metal toolbox would be ideal for transportation.

Disposal of carcasses

Dispose of poisoned carcasses by deep burial at least 500 mm deep and cover with soil.

Do not store traps with fabric attached unless intended for immediate use and dispose of all strychnine impregnated fabric after 3 months.

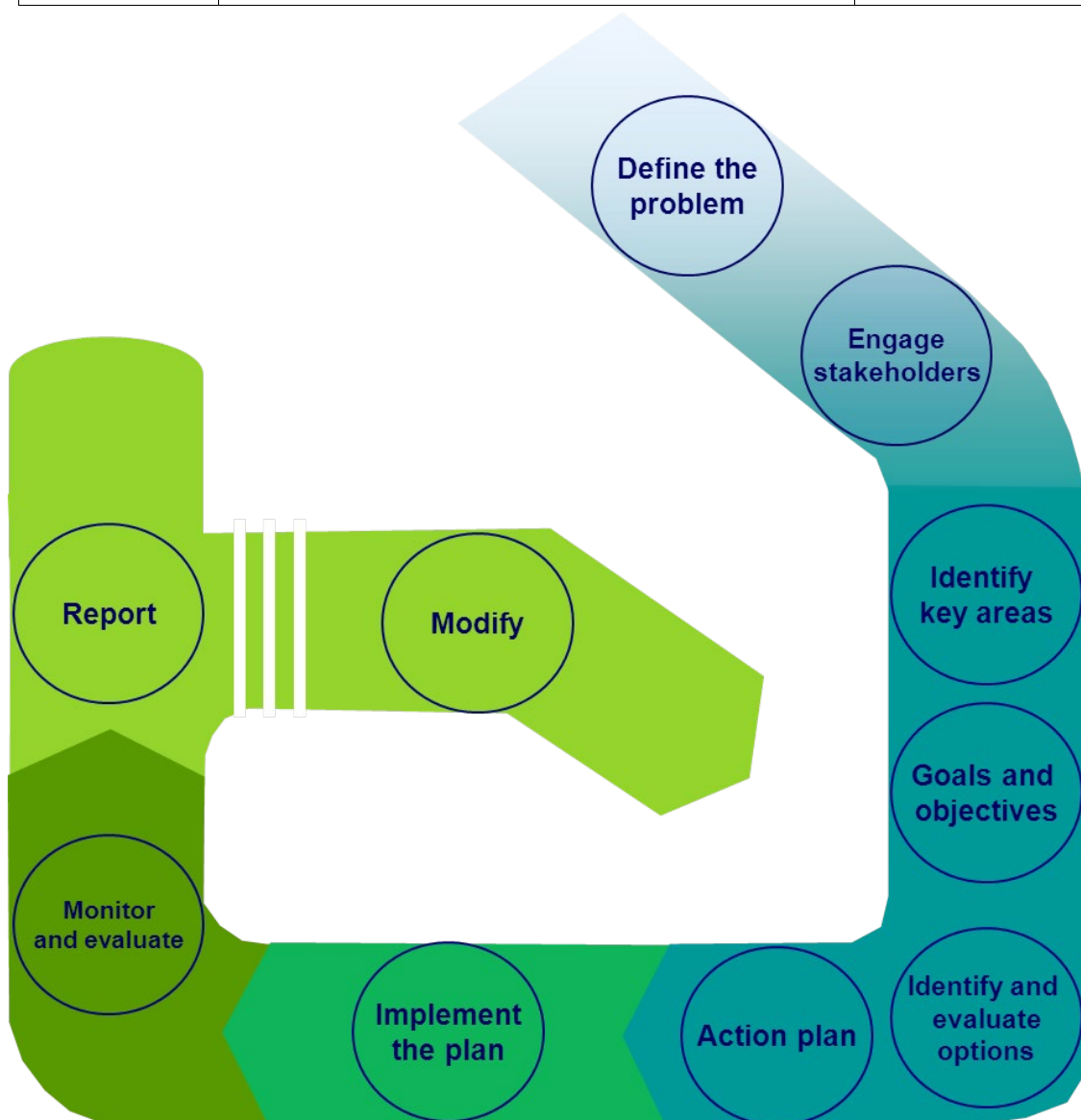
Appendix A - Developing local and regional pest management plans

Vertebrate pest management plans should provide a clear understanding of the pest problem/s in a region or local area, identify the impacts of pest animals and, set clear and achievable goals, objectives and activities required to implement the plan. Plans will vary from region to region. However a number of common planning and development principles should be applied. Table 3 below proposes ten steps adapted from Braysher, M and Saunders, G. 2003, PESTPLAN: “A guide to setting priorities and developing a management plan for pest animals” that should be considered to develop a successful vertebrate pest management plan.

Table 3. Ten step process for developing a regional or local vertebrate pest management plan.

Step	Description	Key considerations
Define the problem	Concentrate on managing and reducing the impacts rather than focusing on pest abundance and distribution alone. Identify and if possible, quantify the production and /or conservation values under threat from pests. Does the cost of pest control outweigh the benefits from control?	Is the problem real or perceived? Define the problem in terms that measure the impacts of the pest animals.
Identify and engage key stakeholders	Identify stakeholders who may be impacted by the management plan. Involving stakeholders early is likely to improve the level of cooperation and involvement. Stakeholders may be engaged as early as Step 1 of the process.	Discuss the problem with affected land managers to identify the scope of the problem, who has the problem, where is the problem and how severe is it?
Identify and prioritise key land management areas	Managing pest animals over a large area may be more easily achieved by dividing regions into smaller, more manageable areas of land guided by: land use, soil or vegetation types or target pest species or areas such as Landcare group, LLS or National Park boundaries. Having clearly defined boundaries, prioritising areas based on their production or land management values, conservation values will facilitate the planning process.	Prioritise areas and management options based on animal impacts. Maps are an invaluable tool when developing strategic management plans.
Determine management goals and measurable objectives	Define the pest problem(s) in terms of the degree of impact. Set clear, measurable and time-limited objectives aimed at reducing the level of pest animal damage to an acceptable level.	Objectives should be: Specific, Measurable, Achievable, Realistic and Time bound
Identify and evaluate management options and conduct a risk analysis	The most appropriate management options will depend on a range of variables such as pest species, level of impact, resources, community attitudes and involvement and political pressure. Management targets may include local eradication although rarely achievable, strategic, pulse, sustained, targeted or no control. Consider doing a risk analysis to identify the costs and benefits of the various options, and potential consequences of each of the management options.	Options for control should consider economic, environmental, social, political and legal outcomes. Determine the costs of control. Do these outweigh the benefits? If so, what other approaches may be considered?
Develop a detailed plan	Detail the actions that will be undertaken: who, what, when, how and where. Identifying milestones and key performance indicators will guide monitoring and evaluation of the plan.	Principles of integrated management should be applied.
Implement the management plan	Develop and maintain effective communication with stakeholders. Provide regular reports and updates on progress of the plan.	Delegate tasks to stakeholders Use trained and accredited contractors

Step	Description	Key considerations
Monitor and evaluate outcomes	Measure the performance of your plan against the original objectives. Share the results of your monitoring and evaluation with your stakeholders and seek their input.	Monitor before, during and after the program. Monitor both pest animal numbers and impacts.
Implement adaptive management	Adaptive management allows the knowledge and experience gained in implementing and monitoring the plan to be incorporated into future actions or to modify and amend the current plan depending on the outcomes being achieved.	Plans should be updated and amended in response to changes, outcomes and contingencies identified during the implementation of the plan.
Report and share outcomes	Communicate outcomes to stakeholders and the broader community. This will ensure sustained cooperation and support for future programs and initiatives.	Reporting the outcomes of your plan will maintain the support and cooperation of stakeholders.



Appendix B - Summaries of key acts relevant to pest animal management

Note: These summaries are not intended to replace or interpret the various Acts; it is intended only to give a broad overview of the areas of the Acts that relate to vertebrate pest management. Complete copies of the legislation listed below are available at: <http://www.legislation.nsw.gov.au/>, <http://www.lawfoundation.net.au/legislation> or <http://www.austlii.edu.au/>

Agricultural and Veterinary Chemicals Code Act 1994

The registration of agricultural and veterinary active constituents and their products is conducted through a national registration scheme. All aspects of Agvet chemicals up until the point of retail sale is controlled by the federal *Agricultural and Veterinary Chemicals Code Act 1994* (AgVet Code 1994). The AgVet Code 1994 is administered by the APVMA. State and territory legislation regulates all aspects of Agvet chemicals following the point of sale such as the control of chemical usage. For example, the APVMA regulates 1080 up to and including the point of retail sale. Once supplied to the end user, it comes under the regulation of individual States or Territories. NSW administers 1080 through a PCO issued under the Pesticides Act.

Under the AgVet Code 1994, all pesticides possessed, sold, supplied or intended for use must be registered. It is an offence to possess or use an unregistered pesticide unless approval has been granted through an APVMA permit.

Labels are approved under the AgVet Code 1994. It is illegal to detach, alter, deface, obliterate or destroy the label on a pesticide container or to affix other labels.

The APVMA may declare certain chemical products to be RCPs if special training, and other requirements, are needed to be able to handle or use the chemical.

Products that are declared to be RCPs can only be used by an authorised person. The relevant Australian State or Territory authority, such as EPA in NSW, determines who may be considered as an authorised person.

Legislation relating to RCPs may be found in Part 4, Division 4 of the AgVet Code 1994. Currently RCPs that are vertebrate pest poisons include 1080, pindone concentrate, PAPP and RHDV.

NSW Biosecurity Act 2015

The Biosecurity Act promotes biosecurity as a shared responsibility between government, industry and communities. The Biosecurity Act provides for a flexible, outcome focused approach to managing biosecurity risk and impacts. This means that community members are able to achieve the outcomes of preventing, eliminating or minimising the biosecurity risks and impacts posed, or likely to be posed by pest animals through a range of best practice management methods.

The biosecurity risks and impacts posed or likely to be posed by priority pest animal species are generally regulated under Part 3 of the Biosecurity Act, using the general biosecurity duty. A wide range of community members have a general biosecurity duty for the management of the biosecurity risks and impacts associated with priority pest animals.

General control and management of pest animals as outlined in the LLSs Regional Strategic Pest Animal Management Plans can be considered as mechanisms for individuals to discharge their general biosecurity duty.

The general biosecurity duty will be supported by mandatory measures. Mandatory measures are specific requirements prescribed in the Biosecurity Regulation 2017.

If there is a failure to discharge the general biosecurity duty in relation to a pest animal, the issue should be taken up with the landowner or manager with a view towards education and capacity building.

Ongoing non-compliance can be dealt with through the use of an individual biosecurity direction to take specified actions or a general biosecurity direction, where there are multiple properties or actions required in a specified area. Landholders may also offer a biosecurity undertaking to take specified actions to rectify the failure to discharge their general biosecurity duty. See Appendix C for more information regarding compliance processes.

The Biosecurity Act provides for appointment of authorised officers. Powers of an authorised officer are detailed in Part 8 of the Biosecurity Act.

Some relevant sections of the Biosecurity Act are summarised in Table 4 below. This summary is not intended to replace or interpret the Biosecurity Act it is intended only to give a broad overview of key principles and purposes and functions for powers provided for authorised officer.

Table 4. Summary of relevant sections of the *Biosecurity Act 2015* with regard to pest animal control. Part 2 – Interpretation, key concept and principles

Section	What it does
Section 10 Biosecurity matter	Biosecurity matter means: <ul style="list-style-type: none"> (a) any living thing, other than a human, or (b) any part of an animal, plant or living thing, other than a human, or (c) a product of a living thing, other than a human, or (d) a disease, or (e) a prion, or (f) a contaminant, or (g) a disease agent that can cause disease in a living thing (other than a human) or that can cause disease in a human via transmission from a non-human host to a human, or (h) any thing declared by the regulations to be biosecurity matter.
Section 11 Carriers	A carrier means any thing (whether alive, dead or inanimate, and including a human) that has, or is capable of having, any biosecurity matter on it, attached to it or contained in it.
Section 12 Dealings	<p>(1) Deal with biosecurity matter or a carrier, or engage in a dealing with biosecurity matter or a carrier, includes any of the following:</p> <ul style="list-style-type: none"> (a) keep biosecurity matter or a carrier, (b) have possession, care, custody or control of biosecurity matter or a carrier, (c) produce, manufacture or supply biosecurity matter or a carrier, (d) import biosecurity matter or a carrier into the State, (e) acquire biosecurity matter or a carrier, (f) buy, sell or dispose of biosecurity matter or a carrier, (g) move biosecurity matter or a carrier, (h) release biosecurity matter or a carrier from captivity, (i) use or treat biosecurity matter or a carrier for any purpose, (j) breed, propagate, grow, raise, feed or culture biosecurity matter or a carrier, (k) experiment with biosecurity matter or a carrier, (l) display biosecurity matter or a carrier, (m) enter into an agreement or other arrangement under which another person deals with biosecurity matter or a carrier, (n) agree to deal with biosecurity matter or a carrier, (o) cause or permit a dealing in biosecurity matter or a carrier to occur, (p) anything prescribed by the regulations as a dealing with, or engaging in a dealing with, biosecurity matter or a carrier. <p>(2) An occupier of land is taken to have possession of any biosecurity matter or carrier on that land unless the occupier establishes that the biosecurity matter or carrier was in the possession, care, custody or control of another person.</p> <p>(3) The regulations may specify circumstances in which a person is taken not to be dealing with or engaging in a dealing with biosecurity matter or a carrier for the purposes of this Act or any provision of this Act.</p>
Part 3 General Biosecurity duty	
Section	What it does
Section 22 Biosecurity duty-dealings with biosecurity matter and carriers	<p>Any person who deals with biosecurity matter or a carrier and who knows, or ought reasonably to know, the biosecurity risk posed or likely to be posed by the biosecurity matter, carrier or dealing has a biosecurity duty to ensure that, so far as is reasonably practicable, the biosecurity risk is prevented, eliminated or minimised.</p> <p><i>This relies on establishing that a person has a dealing with biosecurity matter, and or a carrier (see Section 11 and 12 above).</i></p>

<p>Section 23 Offences of failing to discharge biosecurity duty</p>	<p>(1) A person who fails to discharge the person's biosecurity duty under this Part is guilty of an offence.</p> <p>(2) An offence against this section is a category 1 offence if:</p> <p>(a) the failure is intentional or reckless, and</p> <p>(b) the failure caused, or was likely to cause, a significant biosecurity impact.</p> <p>(3) In any other case, the offence is a category 2 offence.</p> <p>(4) An offence against this section is an executive liability offence.</p> <p>(5) A person who is guilty of a category 1 offence or category 2 offence against this section because the person fails to discharge the person's biosecurity duty under this Part:</p> <p>(a) continues, until the duty is discharged, to be required to discharge that duty, and</p> <p>(b) is guilty of a continuing offence (of the same category) for each day the failure continues.</p>
<p>Section 24</p>	<p>(1) The regulations may require persons who deal with biosecurity matter or carriers to take specified actions to prevent, eliminate or minimise a biosecurity risk posed or likely to be posed by the biosecurity matter, carrier or dealing. Those requirements are mandatory measures.</p> <p>(2) The mandatory measures may apply in relation to all or any specified class of persons, dealings, biosecurity matter or carriers.</p> <p>(3) A person who deals with biosecurity matter or a carrier and who contravenes any mandatory measures that are applicable to the biosecurity matter, carrier or dealing is taken to have failed to ensure that, so far as is reasonably practicable, the biosecurity risk posed or likely to be posed by the biosecurity matter, carrier or dealing is prevented, eliminated or minimised.</p> <p>Note. Accordingly, the person could be charged with an offence under section 23 in respect of that failure.</p> <p>(4) The mandatory measures may be specified to be minimum mandatory measures, in which case compliance with those measures does not, of itself, demonstrate that a person ensured that, so far as is reasonably practicable, the biosecurity risk posed or likely to be posed by the biosecurity matter, carrier or dealing was prevented, eliminated or minimised.</p> <p>(5) In this section, actions include:</p> <p>(a) refraining from doing a thing, and</p> <p>(b) adopting any procedures or programs.</p>
<p>Section 25 Offence of failure to comply with mandatory measures</p>	<p>(1) A person who deals with biosecurity matter or a carrier in contravention of any mandatory measures that apply to that biosecurity matter, carrier or dealing is guilty of an offence.</p> <p>(2) An offence against this section is a category 2 offence.</p> <p>(3) An offence against this section is an executive liability offence.</p> <p>(4) A person who is guilty of an offence against this section because of a contravention of any mandatory measures:</p> <p>(a) continues, until the mandatory measures are complied with and despite the fact that any specified period or time for compliance has expired or passed, to be required to comply with the mandatory measures, and</p> <p>(b) is guilty of a continuing offence for each day the contravention continues.</p> <p>(5) A person cannot be found guilty of both an offence against section 23 and an offence against this section in respect of the same conduct.</p> <p>(6) In proceedings for an offence against section 23 in which it is alleged the person charged with the offence contravened any mandatory measures, if the court is not satisfied that the offence is proven, but is satisfied that the person committed an offence against this section, the court may find the person guilty of an offence against this section. The person is liable to punishment accordingly.</p>

Part 8 – Powers of authorised officers	
Section	What it does
Section 89 Purposes for which function under Part may be exercised	(1) An authorised officer may exercise the functions conferred by this Part for any of the following purposes: <ul style="list-style-type: none"> (a) for the purpose of investigating, monitoring and enforcing compliance with the requirements imposed by or under this Act, (b) for the purpose of obtaining information or records for purposes connected with the administration of this Act, (c) if the authorised officer is a biosecurity auditor, for the purpose of exercising functions in connection with a biosecurity audit, (d) for the purpose of assisting a biosecurity auditor to exercise the biosecurity auditor's functions in connection with a biosecurity audit, (e) for the purpose of preventing, eliminating, minimising or managing biosecurity risks or suspected biosecurity risks, (f) for the purpose of preventing, managing or controlling a biosecurity impact, (g) for the purpose of enforcing, administering or executing this Act (including any instrument made under this Act). (2) In this Part, a reference to an authorised purpose is a reference to any purpose referred to in subsection (1).

Firearms Act 1996

The *Firearms Act 1996* prescribes the licencing and use of firearms in NSW. This legislation sets out who can be issued a firearms licence and licence categories. The firearms Act also prescribes the acquisition, storage and disposal of firearms. Persons employed in the pest control field should be aware that additional firearm use requirements and policies may be required by your employer.

For more information go to https://www.police.nsw.gov.au/online_services/firearms

Game and Feral Animal Control Act 2002

Game and feral animal hunting in NSW is subject to regulations to ensure the safety of all users of public land. The conditions which apply to legal hunting in NSW are set out in the *Game and Feral Animal Control Act 2002* and associated Game and Feral Animal Control Regulation 2012.

The DPI Game Licensing Unit is responsible for administering and managing compliance under this legislation.

Additional requirements apply depending on whether you are hunting on public or private land.

The objectives of the *Game and Feral Animal Control Act 2002* are:

- (a) to provide for the effective management of introduced species of game animals, and
- (b) to promote responsible and orderly hunting of those game animals on public and private land and of certain pest animals on public land.

The relevant sections of the *Game and Feral Animal Control Act 2002* are summarised below. This summary is not intended to replace or interpret the *Game and Feral Animal Control Act 2002*. It is intended only to give a broad overview of the areas of the Act that relate to vertebrate pests and their management.

See <https://www.dpi.nsw.gov.au/hunting> for more information on the *Game and Feral Animal Control Act 2002* and Game licencing in NSW.

Table 5. Summary of relevant sections of the *Game and Feral Animal Control Act 2002* (amended 2014) with regards to pest control.

Part 1 – Preliminary	
Section	What it does
<p>Section 5 Game animals for the purposes of this Act</p>	<p>(1) For the purposes of this Act, a game animal is any animal specified in Schedule 3 that is living in the wild.</p> <p>(2) The Minister may, by order published on the NSW legislation website, amend Schedule 3:</p> <ol style="list-style-type: none"> a. by adding the name or description of any animal (other than an animal of a species that was native to Australia before European settlement), or b. by omitting or amending any such name or description. <p>1. Despite any other provision of this section, a game animal does not include any animal that is or is part of a threatened species, population or ecological community within the meaning of the <i>Threatened Species Conservation Act 1995</i>.</p> <p>Schedule 3 Game animals,</p> <p>Part 1 Non-indigenous game animals (licence required to hunt on public or private land)</p> <p>Birds</p> <p>Bobwhite Quail (<i>Colinus virginianus</i>) California Quail (<i>Lophortyx callipepla californicus</i>) Guinea Fowl (<i>Numida meleagris</i>) Partridge (<i>Alectoris alectoris chukar</i>) Peafowl (<i>Pavo cristatus</i>) Pheasant (<i>Phasianus phasianus colchicus</i>) Spotted Dove (<i>Streptopelia chinensis</i>) Turkey (<i>Meleagris gallopavo</i>)</p> <p>Other animals</p> <p>Deer (Family <i>cervidae</i>)</p> <p>Part 2 Non-indigenous animals (licence required to hunt on public land only)</p> <p>Note: A game hunting licence is not required for hunting the animals listed in this Part on private land, and accordingly is only required if the animals are living in the wild on public land-see section 17</p> <p>Cat Dog (other than dingo) Goat Fox Hare Rabbit Pig Common Starling (<i>Sturnus vulgaris</i>) Common or Indian Myna (<i>Acridotheres tristis</i>) Feral Pigeon (<i>Columba livia</i>)</p>
<p>Section 9 Functions of Game and Pest Management Advisory Board</p>	<p>(1) The Advisory Board has the following functions:</p> <ol style="list-style-type: none"> (a) to represent the interests of licensed game hunters in matters arising under this Act, (b) to provide advice on request to the Minister or the Regulatory Authority on game and feral animal control, (c) to provide advice on request to the Minister on priorities for expenditure on research from the Game and Pest Management Trust Fund, (d) to provide advice to the Minister or the Regulatory Authority on educational courses relating to game hunting. <p>(2) The Advisory Board is subject to the control and direction of the Minister (except in relation to the contents of any advice of the Advisory Board).</p> <p>(3) The Advisory Board is to provide the Minister with an annual report of its activities during the year.</p>

Part 3 – Licensing and control of hunting for game animals	
Division 1 – Preliminary	
Section	What it does
Section 14 Classes of game hunting licences	The following classes of game hunting licences may be granted under this Act: (a) general game hunting licences, (b) restricted game hunting licences.
Section 15 Authority conferred by different classes of game hunting licences	<p>(1) General licence A general game hunting licence authorises, subject to this Act, the holder of the licence to hunt game animals on any private land. (a) to hunt game animals (other than native game birds) on private land, and (b) to kill (and for that purpose hunt) native game birds on private land if permitted to do so under the authority of a native game bird management licence.</p> <p>Note. Part 3A provides for the grant, for sustainable agricultural management purposes only, of a native game bird management licence to the owner or occupier of private land under which native game birds may be killed by the holders of general or restricted game hunting licences in accordance with set annual quotas.</p> <p>(2) Restricted licence A restricted game hunting licence authorises, subject to this Act, the holder of the licence to hunt game animals on public land as well as any private land. (a) to hunt game animals (other than native game birds) on public land as well as private land, and (b) to kill (and for that purpose hunt) native game birds on private land if permitted to do so under the authority of a native game bird management licence.</p> <p>Note: In the case of hunting on public land, section 18 provides that a game hunting licence does not authorise hunting unless the land is duly declared under section 20 to be available for hunting. Such a declaration may require hunters to register and obtain written permission to hunt on that land.</p> <p>(2A) Possession of carcass or skin or other part of game animal A game hunting licence authorises the holder of the licence to possess the carcass, or the skin or any other part, of any game animal that the licence holder has killed under the authority conferred by the licence.</p> <p>(3) Entry into land A game hunting licence does not authorise the holder of the licence to enter any land that the holder is not otherwise authorised to enter.</p> <p>(4) Other statutory prohibitions Except as provided by section 6A (1), a game hunting licence does not authorise the holder of the licence to contravene any prohibition or restriction imposed by or under any Act or statutory instrument.</p>
Division 2 – Licensing of hunters of game animals	
Section	What it does
Section 16 Licence required to hunt game animals	(1) A person who hunts a game animal on any private land or public land is guilty of an offence unless the person is the holder of a game hunting licence. (2) This section is subject to the other provisions of this Part.

<p>Section 17 Exemptions from requirement for game hunting licence</p>	<p>1) A game hunting licence is not required under this Division in respect of the following:</p> <ul style="list-style-type: none"> (a) a person who is hunting an animal listed in Part 2 of Schedule 3 on private land, (b) a person who is hunting on any land owned or occupied by the person or by a member of the person's household, (b1) a person who is hunting on any land owned or occupied by the person's employer or by a corporation of which the person is an officer, (but not if the person is hunting native game birds), (c) an Aboriginal person: <ul style="list-style-type: none"> (i) who is hunting a game animal pursuant to a native title right or interest that is the subject of an approved determination of native title or of a registered native title claim, or (ii) who is a member, or in the company of a member, of a Local Aboriginal Land Council and who is undertaking traditional cultural hunting within the area of the Council, (d) a person who is hunting animals listed in Part 2 of Schedule 3 in accordance with a duty imposed on the person (or on any corporation of which the person is an officer or employee) under <i>Local Land Services Act 2013</i> or the <i>Wild Dog Destruction Act 1921</i> to suppress and destroy the animals (other than a person assisting any such person in the performance of that duty), (d1) a person who is hunting deer in accordance with a duty imposed on the person or the person's employer (or on any corporation of which the person is an officer) because of a deer control order or compliance direction under the <i>Deer Act 2006</i>, (e) (Repealed) (f) a person employed by any public or local authority (including a member of staff of Local Land Services) who is acting in the execution of his or her duties as such an employee, (f1) a person who is harming native game birds on any land in accordance with a licence under the <i>National Parks and Wildlife Act 1974</i>, <p>Note. That Act provides for the issue of licences to harm native animals for purposes other than sustainable agricultural management purposes.</p> <ul style="list-style-type: none"> (a) a veterinary practitioner (within the meaning of the <i>Veterinary Practice Act 2003</i>) or other person who is acting for the purposes of killing or treating an animal in distress due to injury or illness, (b) a person of a class, or hunting in the circumstances, prescribed by the regulations. <p>(2) A person who is not required to hold a game hunting licence because of this section is not prevented from applying for and being granted a licence in accordance with this Act.</p>
<p>Division 3 – Control of hunting for game animals on public lands (restricted game hunting licences)</p>	
<p>Section</p>	<p>What it does</p>
<p>Section 18 Hunting of game animals on public land</p>	<p>A person who hunts a game animal on any public land and who is required by Division 2 to hold a game hunting licence to do so is guilty of an offence unless:</p> <ul style="list-style-type: none"> (a) a declaration is in force under this Division that permits the person to hunt that game animal on that land at that time, and (b) the person is the holder of a restricted game hunting licence.
<p>Section 19 Special qualifications for restricted game hunting licence</p>	<p>(1) A person is not entitled to be granted a restricted game hunting licence unless:</p> <ul style="list-style-type: none"> (a) the person is a member of a hunting club, or organisation, approved by the Regulatory Authority, and (b) the person satisfies the Regulatory Authority that he or she has undertaken adequate training for the activities authorised by the licence. <p>(1) In this section, <i>adequate training</i> includes training of a kind prescribed by the regulations.</p>

<p>Section 20 Declaration of public lands available for hunting game</p>	<p>(2) For the purposes of this section, the responsible Minister for public lands is the Minister who has the care or control of the land or who is responsible for the authority that has the care or control of the land.</p> <p>(3) The responsible Minister for public land may make a declaration in accordance with this section that game animals on that land may be hunted by persons duly licensed under this Act.</p> <p>(4) The responsible Minister must, before making a declaration, give public notice of the proposed declaration in accordance with the regulations.</p> <p>(5) The responsible Minister is, before making a declaration, to have regard to:</p> <ul style="list-style-type: none"> (a) the impact of the declaration on public safety, and (b) the rights of others using the land, and (c) any plan of management or other policy document relating to the use or management of the land, and (d) any recommendation of the authority that has care or control of the land, and (e) any recommendation of the Regulatory Authority. <p>(6) A declaration may be limited to particular parts of the land, to particular game animals, to particular times or to other particular circumstances.</p> <p>(7) A declaration may require a person who hunts game animals in the land concerned:</p> <ul style="list-style-type: none"> (a) to register with a specified person or body before hunting on the land, and (b) to comply with any exclusion or other notice issued or erected by the authority that has the care or control of the land, and (c) to comply with such other requirements as are specified in the declaration. <p>A person is not permitted by the declaration to hunt game animals unless any such requirements are complied with.</p> <p>(8) The responsible Minister is to give a copy of any declaration to the Regulatory Authority and is to cause the declaration to be made public in such manner as the Minister thinks fit.</p> <p>(9) A declaration remains in force for the period specified in the declaration unless it is sooner revoked by the responsible Minister.</p> <p>(10) The responsible Minister may delegate to any authority or other person any function of the Minister under this section.</p> <p>(11) A declaration does not confer authority for anything that is inconsistent with the requirements of any other Act or law.</p> <p>(12) The Minister may vary or revoke a declaration under this section.</p>
<p>Part 5 – Miscellaneous</p>	
<p>Section</p>	<p>What it does</p>
<p>Section 55 Offence of releasing animals for the purpose of hunting</p>	<p>A person must not release a game animal into the wild for the purpose of hunting the animal or its descendants.</p>

National Parks and Wildlife Act 1974

All native birds, reptiles, amphibians, and mammals, except the dingo are protected in NSW under the *National Parks and Wildlife Act 1974* (NPW Act) and the National Parks and Wildlife Regulations 2009. Once a particular plant or animal is listed as a threatened, vulnerable or endangered species they are afforded additional protection under the *Threatened Species Act 1995*. The agency responsible for the protection of native animals and plants in NSW is NPWS.

Some native birds are not protected in certain parts of NSW because they are either agricultural or pastoral pests:

- Sulphur-crested cockatoos and galahs have been declared 'locally unprotected' west of the Great Dividing Range in the Central and Western divisions of the state, because of the damage they do to grain crops
- Crows and ravens (Corvids) are protected in the counties of Camden (Illawarra region), Cumberland (Sydney basin) and Northumberland (Hunter region)
- The purple swamp hen is not protected in 10 irrigation districts and areas in the Riverina region, where the species causes considerable damage to irrigated crops such as rice.
- The dingo is regarded as a wild dog under the LLS Act. Wild dogs are declared 'pest animals' under that legislation.

Table 6. Summary of relevant sections of the *National Parks and Wildlife Act 1974* with regards to pest control.

National Parks and Wildlife Act 1974	
Section 109 Unlawful liberation of animals	(1) A person shall not liberate, anywhere in New South Wales, any animal (other than a homing pigeon or a captured animal which is native to New South Wales) unless under and in accordance with a licence under section 127. (2) A person shall not liberate, elsewhere other than in the locality of capture, any captured animal which is native to New South Wales unless under and in accordance with a licence under section 127
Section 111 Method of shooting fauna	A person shall not, for the purpose of harming any protected fauna, use any firearm of a kind other than the kind habitually raised at arm's length and fired from the shoulder without other support
Section 120 General licence	(1) The Chief Executive may issue a licence (in this Act referred to as a general licence), authorising a person to do any or all of the following: (a) to harm or obtain any protected fauna for any specified purpose,
Section 121 Occupier's licence	(1) The Chief Executive may issue a licence (in this Act referred to as an occupier's licence), authorising an owner or occupier of specified lands: (a) to harm, or (b) to permit a person, holding a general licence issued to the person under section 120 or a commercial fauna harvester's licence issued to the person under section 123, to harm, a specified number of fauna of a specified class found on those lands and the licence may authorise the disposal, whether by sale or otherwise, of fauna harmed under the authority of the licence.
Section 156B Powers of authorised officers	(1) The Chief Executive may appoint any person (including a class of persons) to be an authorised officer for the purposes of national parks legislation. Such an appointment is to be made under Chapter 7 of the <i>Protection of the Environment Operations Act 1997</i> (the POEO Act) as applied under this section. (2) An authorised officer has and may exercise the functions of an authorised officer under Chapter 7 (except Part 7.6) of the POEO Act for the following purposes: (a) for determining whether there has been compliance with or a contravention of national parks legislation,

National Parks and Wildlife Act 1974	
	(b) for obtaining information or records for purposes connected with the administration of national parks legislation, (c) generally for administering national parks legislation.
Section 171 Authority to harm or pick	(1) The Chief Executive may authorise any person: (a) to harm: i) animals within a national park, historic site, nature reserve, karst conservation reserve, state conservation area, regional park, Aboriginal area, wildlife refuge or conservation area, or
National Parks and Wildlife Regulation 2009	
Clause 20 Weapons	(1) A person must not in a park: (a) carry or discharge or have in the person's possession any firearm, or imitation firearm, within the meaning of the Firearms Act 1996 or prohibited weapon within the meaning of the Weapons Prohibition Act 1998, or (b) carry or discharge or have in the person's possession any airgun, speargun or other lethal weapon, or (c) carry or use or have in the person's possession any explosive, flare or firework, or (d) carry or use or have in the person's possession any ammunition, or (e) throw or propel by any means any object likely to cause damage or injury to any person, animal or thing, or (f) without reasonable excuse, carry, use, possess or have custody of a knife.
Clause 25 Interference with park management	A person must not: (a) destroy, damage or remove any thing that is being used or intended to be used by the park authority for the suppression or destruction of any animals in a park, or (b) interfere with anything that is being used or intended to be used by the park authority for the suppression or destruction of any animals in a park in a manner that is likely to impair its effectiveness, or

Non-native (unprotected) animals

Non-native animals, called 'unprotected fauna' under the NPW Act, might have legal protection under other legislation, such as:

- *Prevention of Cruelty to Animals Act 1979*
- *Companion Animals Act 1998*
- *Non-Indigenous Animals Act 1987*
- *Exhibited Animals Protection Act 1986*
- *Game and Feral Animal Control Act 2002.*

How are native animals protected?

The NPW Act contains a range of offences protecting native animals; and a broad range of defences or lawful justifications:

- It is an offence to harm protected fauna. This includes harm by using a substance such as poison, an animal such as hunting dog, a gun, net or trap.
- It is an offence to buy, sell or possess protected fauna although sometimes licences are available to do this.
- A person who is rescuing an injured animal will not commit an offence so long as they notify the Chief Executive in writing within 7 days that they have the animal. They are not allowed to keep the animal as a pet.

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- A person shall not liberate, anywhere in NSW, any animal, other than a homing pigeon or a captured animal that is native to NSW, unless under and in accordance with a licence under Section 127 of the Act.

Prevention of Cruelty to Animal Act 1979

The *Prevention of Cruelty to Animals Act 1979* (Prevention of Cruelty to Animals Act) and its associated regulation legislate acceptable standards for animal welfare. The objectives of the Act, as described in Section 3, are:

- (a) to prevent cruelty to animals; and
- (b) to promote the welfare of animals by requiring a person in charge of an animal:
 - (i) to provide care for the animal, and
 - (ii) to treat the animal in a humane manner, and
 - (iii) to ensure the welfare of the animal.

The relevant sections of the Prevention of Cruelty to Animals Act are summarised below. This summary is not intended to replace or interpret the Prevention of Cruelty to Animals Act. It is intended only to give a broad overview of the areas of the Act that relate to vertebrate pests.

Table 7. Summary of relevant sections of the Prevention to Cruelty of Animals Act with regards to pest control

Part 2 – Offences	
Section	What it does
<p>Section 5 Cruelty to animals</p>	<p>(1) A person shall not commit an act of cruelty upon an animal.</p> <p>(2) A person in charge of an animal shall not authorise the commission of an act of cruelty upon the animal.</p> <p>(3) A person in charge of an animal shall not fail at any time:</p> <p>(a) to exercise reasonable care, control or supervision of an animal to prevent the commission of an act of cruelty upon the animal,</p> <p>(b) where pain is being inflicted upon the animal, to take such reasonable steps as are necessary to alleviate the pain, or</p> <p>(c) where it is necessary for the animal to be provided with veterinary treatment, whether or not over a period of time, to provide it with that treatment.</p>
<p>Section 7 Carriage and conveyance of animals</p>	<p>(1) A person shall not:</p> <p>(a) carry or convey an animal, or</p> <p>(b) where the person is a person in charge of an animal – authorise the carriage or conveyance of the animal, in a manner which unreasonably, unnecessarily or unjustifiably inflicts pain upon the animal.</p> <p>(2) Without limiting the generality of subsection (1), a person must not:</p> <p>(a) Carry or convey a horse on a multi-deck vehicle, or</p> <p>(b) where the person is a person in charge of the horse—authorise the carriage or conveyance of a horse on a multi-deck vehicle.</p> <p>(2A) Without limiting subsection (1), a person must not carry or convey a dog (other than a dog being used to work livestock), on the open back of a moving vehicle on a public street unless the dog is restrained or enclosed in such a way as to prevent the dog falling from the vehicle.</p> <p>(3) In this section: multi-deck vehicle means a motor vehicle or a trailer drawn by a motor vehicle that:</p> <p>(a) is used to carry or convey animals, and</p> <p>(b) on which animals are carried or conveyed in two or more layered sections.</p>
<p>Section 8 Animals to be provided with food, drink or shelter</p>	<p>(1) A person in charge of an animal shall not fail to provide the animal with food, drink or shelter, or any of them, which, in each case, is proper and sufficient and which it is reasonably practicable in the circumstances for the person to provide.</p> <p>(2) In any proceedings for an offence against subsection (1), evidence that an animal was not provided with clean water during a period of 24 hours is evidence that the person accused of the offence has failed to provide the animal with proper and sufficient drink during that period.</p> <p>(3) In any proceedings for an offence against subsection (1), evidence that an animal was not provided with food or shelter during a period of 24 hours (or, in the case of an animal of a class prescribed by the regulations, during the period prescribed for that class of animal) is evidence that the person accused of the offence has failed to provide the animal with proper and sufficient food or shelter during that period.</p> <p>(4) Before commencing proceedings for an offence against subsection (1) in respect of a stock animal depastured on rateable land (within the meaning of the <i>Local Land Services Act 2013</i>), the prosecution must obtain advice from Local Land Services and the Department about the state of the animal (if practicable) and the appropriate care for it.</p> <p>(5) The prosecution may, with leave of the court granted in such circumstances as the court considers just, commence or continue proceedings for an offence against subsection (1), despite having failed to comply with subsection (4).</p>
<p>Section 10 Tethering of animals</p>	<p>(1) A person shall not:</p> <p>(a) tether an animal, or</p> <p>(b) where the person is a person in charge of an animal – authorise the tethering of the animal, for an unreasonable length of time or by means of an unreasonably heavy, or unreasonably short, tether.</p> <p>(2) A person must not tether a sow in a piggery.</p> <p>(3) A person must not confine a bird by means of a tether.</p> <p>(4) It is a defence to a prosecution for an offence against subsection (3) if the defendant satisfies the court that the bird to which the offence relates was a raptor and that the tether involved was a jess that was used solely to tether the bird to its handler.</p>

Part 2 – Offences	
Section	What it does
Section 15 Poisons not to be administered to animals	<p>(1) In this section, poison includes:</p> <p>(a) a substance included in the list, as in force for the time being, proclaimed under section 8 of the <i>Poisons and Therapeutic Goods Act 1966</i> (or a substance that includes such a substance), or</p> <p>(b) a substance containing glass or any other thing likely to kill or injure an animal.</p> <p>(2) A person shall not:</p> <p>(a) administer a poison, or a substance containing a poison, to a domestic animal,</p> <p>(b) with the intention of destroying or injuring a domestic animal, throw, cast, drop, leave or lay a poison, or a substance containing a poison, in any place, or</p> <p>(c) have in his or her possession a poison with the intention of using it to kill or injure a domestic animal.</p>
Section 19 Trap-shooting prohibited	A person shall not advertise, promote or take part in a match, competition or other activity in which an animal is released from confinement for the purpose of that person, or any other person, shooting at it.
Section 20 Certain animal-catching activities prohibited	A person shall not advertise, promote or take part in a match, competition or other activity in which an animal is released from confinement for the purpose of that person, or any other person, chasing, catching or confining it.
Section 21 Coursing and other similar activities prohibited	<p>(1) A person who:</p> <p>(a) causes, procures, permits or encourages an activity in which an animal is released from confinement for the purpose of its being chased, caught or confined by a dog, or</p> <p>(b) advertises the intention to conduct such an activity, or</p> <p>(c) promotes, organises or attends such an activity, or</p> <p>(d) uses an animal as a lure or kill for the purpose of blooding greyhounds or in connection with the trialling, training or racing of any coursing dog, or</p> <p>(e) keeps or is in charge of an animal for use as a lure or kill for the purpose of blooding greyhounds or in connection with the trialling, training or racing of any coursing dog, is guilty of an offence.</p>
Section 22 Severely injured animals not to be sold	(1) Subject to subsection (2), a person shall not purchase, acquire, keep or sell, or offer or expose for sale, an animal which is so severely injured, so diseased or in such a condition that it is cruel to keep it alive.
Section 23 Certain traps not to be set	<p>(1) A person shall not, in a prescribed part of New South Wales, set a trap of a prescribed type.</p> <p>(2) A person must not:</p> <p>(a) in any part of New South Wales, set a steel-jawed trap, or</p> <p>(b) possess a steel-jawed trap with the intention of using it to trap an animal.</p> <p>(3) In this section</p> <p>A steel-jawed trap means a trap that has jaws that are made of steel, iron or other metal and that are designed to spring together and trap an animal when a leg or other part of the animal's body comes into contact with, or is placed between, the jaws, but does not include a soft-jawed trap (that is, a trap with steel jaws that are offset and padded).</p>

For the purposes of the *Prevention of Cruelty to Animals Act*, 'animal' includes vertebrate pests.

The overriding concern for vertebrate pest managers under the *Prevention of Cruelty to Animals Act* is that risk assessments and due diligence should include provision to avoid unnecessary suffering of vertebrate pest animals during control activities.

Exemptions

There are a number of practices that are exempt from the Prevention of Cruelty to Animals Act. Exempt activities include hunting, shooting, snaring, trapping, catching or capturing the animal, where the activity is undertaken 'in a manner that inflicted no unnecessary pain on the animal'.

Use of certain types of traps

The Prevention of Cruelty to Animals Act prohibits the use or setting of steel-jawed traps in any part of NSW. Steel-jawed traps are defined as any trap that has jaws that are made of steel, iron or other metal and that are designed to spring together and trap an animal when a leg or other part of the animal's body comes into contact with, or is placed between, the jaws.

However, soft-jawed traps, that is, traps with steel jaws that are offset and padded are permitted to be used, see Part 2, Section 23 of the Prevention of Cruelty to Animals Act.

Use of dogs for pest animal control

Dogs and other animals may be used when hunting, but only if their use is not in contravention to the Prevention of Cruelty to Animals Act; and their use is with the permission of the occupier of the land concerned.

All dogs being used to hunt must be microchipped and wear a collar which has a metal tag or label attached with the name, address and telephone number of the owner of the dog. They must not chase any other species of animal not being hunted.

When using dogs to hunt pigs on public land a person hunting alone may use up to three dogs and a group of hunters may use up to five dogs. Dogs must not be allowed to maul or kill pigs and hunters must take all necessary steps to ensure that their dogs do not inflict unnecessary pain on the pig.

When using dogs to hunt deer a person hunting alone may use one dog to hunt deer or a group may use up to two dogs to hunt deer. The dogs must only be used to locate, point or flush the deer, the dog must not chase the deer or any other species. If not on a lead the dog must be wearing a radio tracking collar.

Dogs must not be abandoned on any land.

Protection of the Environment Operations Act 1997

The *Protection of the Environment Operations Act 1997* (POEO Act) principally deals with the regulation of activities that have the potential to pollute or otherwise harm the NSW environment. The Act is administered by the EPA.

Under Chapter 7, of the POEO Act, EPA authorised officers have powers to search premises, demand names and addresses and record evidence.

In relation to pesticide use and the destruction of pest animals this Act may impose some liability in terms of the pollution of waters. ACOs should be aware of Section 120 of the Act which states:

Section 120 Prohibition of pollution of waters

- (1) A person who pollutes any waters is guilty of an offence.
- (2) In this section: pollute waters includes cause or permit any waters to be polluted.

Note: the pollution of waters includes, but is not limited to:

- placing any matter (whether solid, liquid or gaseous) in a position where:
 - (i) it falls, descends, is washed, is blown or percolates, or
 - (ii) it is likely to fall, descend, be washed, be blown or percolate, into any waters, onto the dry bed of any waters, or into any drain, channel or gutter used or designed to receive or pass rainwater, floodwater or any water that is not polluted, or

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- (iii) placing any such matter on the dry bed of any waters, or in any drain, channel or gutter used or designed to receive or pass rainwater, floodwater or any water that is not polluted, if the matter would, had it been placed in any waters, have polluted or have been likely to pollute those waters

The implications for persons using vertebrate poisons are that:

- any poisoned baits must be placed in such a way to not enter into waterways
- any pest animals destroyed in or near waterways must be moved so that the carcass poses no risk of entering a waterway

EPA guidelines for the disposal of animal carcasses state:

If the carcasses must be disposed of on-site, the following points should be considered.

It is preferable to have:

- a burial area at least 100 m away from houses and watercourses
- the pit base at least 1 m above the level of the water table
- heavy soil of low permeability and good stability
- good access to the site for earthmoving machinery and stock transport unless the stock are to be walked in for slaughter.

Avoid:

- sites sloping towards watercourses
- areas that are likely to drain to watercourses or groundwater.

Note: that the disposal location and quantity of carcasses may trigger the requirement for a waste facility licence under Schedule 1 of the POEO Act except in the case of an emergency mass animal disposal program which would then trigger emergency provisions.

For further information about the disposal of animal carcasses visit

https://www.dpi.nsw.gov.au/__data/assets/pdf_file/0005/798089/Primefact-Animal-carcass-disposal.pdf

Weapons Prohibition Act 1998

This legislation regulates and approves specialised equipment and firearms for use in pest control programs that would otherwise be illegal. This includes high capacity self-loading centrefire rifles used in aerial shooting programs and rifle silencers used in urban pest control. For more information about prohibited weapons go to

http://www.police.nsw.gov.au/services/firearms/permits/prohibited_weapon_permits

Work Health and Safety Act 2011

As a result of a national review of work health and safety laws across the country, a model Work Health and Safety Act was developed and endorsed by the Workplace Relations Ministers' Council in December 2009. Harmonisation in NSW has been achieved through the enactment of the *Work Health and Safety Act 2011* (WHS Act). Essentially this means there is a national approach to State laws, and not a Commonwealth Act to replace State laws. Compliance with the WHS Act is enforced by SafeWork NSW.

The main object of the WHS Act is to provide for a balanced and nationally consistent framework to secure the health and safety of workers and workplaces by:

- (a) protecting workers and other persons against harm to their health, safety and welfare through the elimination or minimisation of risks arising from work or from specified types of substances or plant, and
- (b) providing for fair and effective workplace representation, consultation, co-operation and issue resolution in relation to work health and safety, and

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- (c) encouraging unions and employer organisations to take a constructive role in promoting improvements in work health and safety practices, and assisting persons conducting businesses or undertakings and workers to achieve a healthier and safer working environment, and
 - (d) promoting the provision of advice, information, education and training in relation to work health and safety, and
 - (e) securing compliance with this Act through effective and appropriate compliance and enforcement measures, and
 - (f) ensuring appropriate scrutiny and review of actions taken by persons exercising powers and performing functions under this Act, and
 - (g) providing a framework for continuous improvement and progressively higher standards of work health and safety, and
 - (h) maintaining and strengthening the national harmonisation of laws relating to work health and safety and to facilitate a consistent national approach to work health and safety in this jurisdiction.

Relevant chapters in the Work Health and Safety Regulation will need to be reviewed including and not limited to topics such as Chapter 3 - General risk and workplace management, Chapter 4 - Hazardous work and Chapter 7 - Hazardous chemicals. Relevant codes of practice should also be reviewed to provide guidance to eliminate or control risks in vertebrate pest management. Workers must also be aware of the following items: Schedule 7 - Safety data sheets, Schedule 9 - Classification, packaging and labelling requirements, Schedule 11 - Placard and manifest quantities, Schedule 12 - Manifest requirements, Schedule 13 - Placard requirements and Schedule 14 - Requirements for health monitoring.

Appendix C – Management of priority pest animals under the *Biosecurity Act 2015*

LLS authorised officers play a key role in implementing the *Biosecurity Act 2015* to manage the biosecurity risks of pest animals. An officer is authorised by the LLS after having satisfactorily completed the relevant training.

The *Biosecurity – Management of priority pest animals* procedure provided as “Schedule 4 Invasive Plants and Animals” as a part of the LLS/DPI Memorandum of Understanding.

Components of the draft procedure in relation to regulating the management of priority pest animals are summarised in Table 8 below.

Table 8. Key aspects for management of priority pest animals under the *Biosecurity Act 2015*

Record and triage notification/report of a pest animal or biosecurity impact			
<i>Record details, acknowledge receipt in FARMS.</i>			
Priority pest / biosecurity impact			Prohibited dealing / Matter
<ul style="list-style-type: none"> Priority pest animal or biosecurity notification report received, Acknowledge receipt of report, Record details of pest animal or biosecurity impact in FARMS or FeralScan, 	<ul style="list-style-type: none"> Is the location of the pest animal or biosecurity impact within a relevant LPAMP area? Have best practice pest management activities been undertaken? Are the pest animal or biosecurity impacts being adequately prevented, eliminated or minimised through proactive/ reactive management? Record information in FARMS or FeralScan 	<p>Provide the following advisory material to land manager/relevant person:</p> <ul style="list-style-type: none"> RSPAMP. LPAMP (if relevant) Part 3 of the Biosecurity Act Information on pest animal impacts, ecology, behaviour and best practice options for management <p>Authorised officers must record the information that has been provided, explained, assessed etc. in FARMS or FeralScan.</p>	Report to NSW DPI
Property inspection			
<i>Authorised officer inspects property to assess biosecurity impact, confirm any management action/s, collects evidence and completed records.</i>			
<p>Evidence of pest animal and/or biosecurity impact on land manager's property, either:</p> <ul style="list-style-type: none"> Accept a verbal agreement to implement pest animal control and record contemporaneous notes Accept an Individual Biosecurity Undertaking to control pest animal or biosecurity impact Issue an Individual Biosecurity Direction/ General Biosecurity Direction to control pest animal or biosecurity impact Provide a date for re-inspection Record in FARMS or FeralScan. 	<p>Evidence of pest animal and/or biosecurity impact on surrounding area:</p> <ul style="list-style-type: none"> Issue a General Biosecurity Direction to control pest animal or biosecurity impact Provide a date for re-inspection Record in FARMS or FeralScan. 	<p>Monitor for additional pest animal notification/reports: Authorised officer should monitor for additional pest animal or biosecurity impact notification/reports made in relation to a property where one of the following is in force:</p> <ul style="list-style-type: none"> Verbal agreement Biosecurity Undertaking Biosecurity Direction 	
Re-inspection			
<p>Land manager or person has complied with verbal agreement, Biosecurity Undertaking or Biosecurity Direction.</p> <ul style="list-style-type: none"> Consider revoking Biosecurity Undertaking/Direction. Continue to monitor. 	<p>Land manager or person has not complied with verbal agreement, Biosecurity Undertaking or Biosecurity Direction.</p> <ul style="list-style-type: none"> Consider varying the verbal agreement, Biosecurity Undertaking/Direction. Consider moving from verbal agreement to Biosecurity Undertaking/Direction. Provide written advice to inform the person of the variation. Consider using a warning letter, penalty notice or prosecution. Consider intervention. 		
Intervention			
<p>If a person fails to comply with a Biosecurity Undertaking/Direction an authorised officer may enter the premises and take actions that are necessary to remedy the failure</p>			

Appendix D – Vertebrate pesticides used in NSW

Table 9. Vertebrate pesticides used in NSW. *Always check for current permits and orders

Pesticide Active	Authorisation to obtain, supply and use	Dangerous good	Registered Products	Target species
Brodifacoum	Various APVMA permits for use on Islands of NSW Available to public as bait products for rodents	No	As per Permit. E.g. Ratsak® and Talon®	Wild Rabbits Rodents
Bromadiolone	Available to public as bait products for rodents	No	E.g. Mouseoff® in various bromadiolone bait products	Rodents
Carbon monoxide	None allocated	Yes	DEN-CO-FUME® Carbon Monoxide Fumigant Cartridge	Foxes
Chloropicrin	LLS and farmers are exempt from licensing requirements for this fumigant when used in a pressure fumigator	Yes	South Australian Rural Supplies Rural Larvacide Rabbit Fumigant	Wild Rabbits
Para-aminopropiophenone (PAPP)	Restricted chemical product. Pesticide Control order for PAPP	No	Foxecute Fox bait Dogabait PAPP Wild Dog Bait	Foxes Wild dogs
Phosphine	LLS and farmers are exempt from licensing requirements for this fumigant.	Yes	Pestex® Fumigation Tablets Quickphos Fumigation Tablets Celphide Fumigation Tablets Apparent Fate Fumigation Tablets Farmlinx Grainpro Fumigation Tablets	Wild Rabbits
Pindone	Restricted chemical product for concentrate forms only Pesticide Control (Pindone Products) Order*.	No	ALDI Pindone 25 liquid concentrate® Rabbait Aqueous pindone concentrate® Pindone 25 Rabbit bait rodenticide® Rabbait® Pindone oat bait ALDI Bunnybait® oat bait for rabbits	Wild Rabbits
Rabbit haemorrhagic disease virus (RHDV)	Restricted chemical product Pesticide Control (Rabbit haemorrhagic disease Virus) Order 2006 APVMA permit number PER9305 (no expiry date)	No	Rabbit Haemorrhagic Disease Virus (Lyophilised) Rabbit Haemorrhagic Disease Virus (K5 variant Lyophilised)	Wild Rabbits

Table 9. Continued

Sodium fluoroacetate '1080'	Restricted chemical product relevant APVMA permit*. Pesticide Control Orders for Bait Products and Ejectors	Yes for liquid concentrate. No for prepared and ready-to-use baits	ACTA 1080 concentrate® PAKS 1080 concentrate® Pigout® Feral Pig Bait Doggone® Wild Dog Bait PAKS DE-K9® 1080 Wild Dog Bait Foxoff® Fox Bait PAKS DE-FOX® 1080 Fox bait Canid Pest Ejector 1080 Wild Dog capsules Canid Pest Ejector 1080 Fox Dog capsules Rabbait 1080 Oat Bait 1080 Ready-to-lay Rabbit Oat Bait	Wild dogs Feral pigs Wild Rabbits Foxes Goats* Deer*
Sodium nitrite	Available from rural merchants as a bait product for feral pigs	No	Hoggone®	Feral pigs
Strychnine hydrochloride	APVMA permit number PER14732 (expires 30 June 2024)	Yes (concentrate)	Strychnine treated cloth	Wild dogs
Zinc phosphide	Available from rural merchants or direct from manufactures for rodents in crops and pastures only	No	E.g. Mouseoff® and Rattoff® in various zinc phosphide bait products	Rodents

Appendix E – Checklists for usage and supply records and bait preparation facilities

The lists that have been compiled on the following pages are a guideline to be used in any workplace.

General supply records

General checklist list for bait preparation

- Facility
- Field

General supply records

The following is a list of information that should be recorded when completing usage and supply records.

- Type of vertebrate pesticide register e.g. 1080 liquid concentrate or Foxoff.
- Date - month and year of record
- Agency or organisation's name.
- ACO/s name/s.
- Carried forward balance.
- Usage and supply records to end users.
- Daily receipt (from), transfer (to) record and use for that month.
- Balance left in stock

The usage and supply records to end users

- Bait type such as red meat (wild dog) carrot (rabbit).
- Number or quantity (kg) of bait used.
- Name of person the bait was supplied to.
- Location of bait usage (property name).
- Type of vertebrate pesticide usage record e.g. 1080 liquid concentrate and month and year of record.

Comments:

Name:Date:.....

General checklist list for bait preparation

Facility

The bait preparation area must meet the following conditions:

- Bunded or appropriately sloped impervious floor, drained for effective washing down into a dilution pit or septic system. The dilution pit or septic system, of at least 50 L capacity, must be accessible for sampling. All liquid waste must be able to be held for at least 1 hour if it enters a sewerage system unless approvals have been received from the relevant authority for liquid waste to flow directly into the sewerage system.
- Drain must be sealable and closed off at all times other than when the equipment or the area is being hosed down.
- Sealed floor that must be able to contain the total volume of concentrate in use if the entire contents were spilled.
- Drainage of waste, rinsate and wash down from each facility, whether into a septic or sewerage system, is regulated by local government. Contact the relevant council for the requirements for waste disposal systems.
- Labelled equipment used for measuring and handling pesticides must be securely stored in an area only accessible by an ACO. All equipment used for mixing 1080 bait and preparing ejector capsules must be clearly labelled '1080 Poison' in large red lettering.
- Adequate space for bait cutting and mixing machines, packaging of baits and temporary storage of poisoned baits awaiting distribution.
- Tap with a hose for washing down the facility and equipment after bait has been prepared.
- Sink or hand basin.
- Absorbent material such as hydrated lime to soak up any major spillage.

Field

Vertebrate pesticide baits may be prepared in the field providing the following conditions are met:

- A risk assessment for in-field bait preparation must be carried out by the ACO, this will provide a guide for burial of rinsate and signage requirements.
- Only ACOs are permitted to handle 1080, RHDV and pindone concentrate.
- All PPE such as washable hat, overalls, gloves, respirator and plenty of water are taken to the site.
- The concentrate is transported in a sealed and locked metal or strong plastic box securely fixed to the vehicle, with Toxic 6 signage.
- All bait preparation and mixing should be done over on an impervious surface to ensure any spills, chaff or blood is contained for appropriate disposal.
- At the completion of bait preparation all equipment must be washed down before leaving the site. All rinsate must be drained into burial
- The burial site must be clear of permanent and ephemeral waterways to avoid pollution.
- Alternatively, all rinsate may be collected into a hard plastic container labelled "poison" in large red lettering and transported to the bait preparation facility for disposal.

Name:Date:.....

Appendix F – Summary of bait material and applications rates for vertebrate poisons

1080

Wild dogs

1080 bait material for wild dogs

An ACO may use 1080 liquid concentrate products to produce 1080 bait material. Where an ACO uses material to produce 1080 bait material, the ACO must only use boneless red meat, offal (heart, tongue and liver). Each red meat and offal bait produced must weigh approximately 250g prior to any drying process. Persons preparing 1080 bait material must follow wild dog bait preparation instructions on the approved label of the 1080 liquid concentrate product.

1080 application rate for wild dogs

When using the ACTA 1080 Concentrate product or PAKS 1080 Concentrate product all bait material, as indicated above, must be injected with 0.2ml of the product per bait.

Foxes

1080 bait material for foxes

An ACO may use 1080 liquid concentrate products to produce 1080 bait material. Where an ACO uses material to produce 1080 bait material, the ACO must only use fowl heads, chicken or turkey wingettes, boneless red meat, offal (tongue, heart kidney and liver), bird eggs, and manufactured sausage baits. Each red meat and offal bait must weigh a minimum of 100g prior to any drying process. An exemption to the minimum 100g weight applies for whole lamb tongue and whole lamb kidneys but they must weigh more than 70g. Persons preparing 1080 bait material must follow fox bait preparation instructions on the approved label of the 1080 liquid concentrate product.

1080 application rate for foxes

When using the ACTA 1080 Concentrate product or PAKS 1080 Concentrate product all bait material, as indicated above, must be injected with 0.1ml of the product per bait.

Table 10. Bait application rates and bait base for ground and aerial distribution.

Species	Bait base	Ground baiting	Aerial Baiting
Fox	Fowl Heads	Up to 10 baits per km- 20 per 100 Ha	Not allowed
Fox	Chicken Wingettes	Up to 10 baits per km- 20 per 100 Ha	Up to 10 baits per km
Fox	Boneless Red Meat	Up to 10 baits per km- 20 per 100 Ha	Up to 10 baits per km
Fox	Offal (whole lamb tongue, whole lamb kidney, heart*, liver*)	Up to 10 baits per km- 20 per 100 Ha	Up to 10 baits per km
Fox	Fowl eggs	Up to 10 baits per km- 20 per 100 Ha	Not allowed
Fox	Manufactured sausage	Up to 10 baits per km- 20 per 100 Ha	Up to 10 baits per km
Fox	Foxoff	Up to 10 baits per km- 20 per 100 Ha	Up to 10 baits per km
Fox	Foxsheild	Up to 10 baits per km- 20 per 100 Ha	Up to 10 baits per km
Fox	Defox	Up to 10 baits per km- 20 per 100 Ha	Up to 10 baits per km
Dog	Boneless Red Meat	Up to 10 baits per km- 20 per 100 Ha	Up to 40 baits per km
Dog	Offal (tongue, heart, liver*)	Up to 10 baits per km- 20 per 100 Ha	Up to 40 baits per km
Dog	Doggone	Up to 10 baits per km- 20 per 100 Ha	Up to 40 baits per km
Dog	DK-9	Up to 10 baits per km- 20 per 100 Ha	Up to 40 baits per km

* Ground baiting only

Note: All bait weights must comply with weight requirements – 100 g for foxes and 250 g for dogs (wet weight before drying).

Feral pigs

1080 bait material for feral pigs

An ACO may use 1080 liquid concentrate products to produce 1080 bait material. Where an ACO uses material to produce 1080 bait material, the ACO must only use grain and manufactured pellets. Persons preparing 1080 bait material must follow feral pig bait preparation instructions on the approved label of the 1080 liquid concentrate product.

1080 application rate for feral pigs

When using the ACTA 1080 Concentrate product or PAKS 1080 Concentrate product, grain bait material must be mixed at the rate of 15ml of product per kilogram of grain and manufactured pellets must be mixed at the rate of 15ml of product per kilogram of pellets.

Table 11: 1080 liquid concentrate mixing rates for feral pig poisoning.

Mixing rate per kg of bait: Grain - 15 mL of 1080 liquid concentrate to every kilogram of grain bait. Pellets - 15 mL of 1080 liquid concentrate + 15 mL of water to every kilogram of pellet bait			
Bait weight kg	Grain	Pellets	
	1080 liquid conc. mL	1080 liquid conc. mL	Water mL
1	15	15	15
5	75	75	75
10	150	150	150
15	225	225	225
20	300	300	300
25	375	375	375
30	450	450	450
35	525	525	525
40	600	600	600
45	675	675	675
50	750	750	750

Rabbits

1080 bait material for rabbits

An ACO may use 1080 liquid concentrate products to produce 1080 bait material. Where an ACO uses material to produce 1080 bait material, the ACO must only use oats, manufactured pellets and carrots. An ACO must dice carrots into pieces approximately 2 centimetres by 2cm in size or 5g in weight. Persons preparing 1080 bait material must follow rabbit bait preparation instructions on the approved label of the 1080 liquid concentrate.

1080 application rate for rabbits

When using the ACTA 1080 Concentrate product or PAKS 1080 Concentrate product, oat bait material must be mixed at the rate of 12ml of product per kilogram of oats, manufactured pellets must be mixed at the rate of 15ml of product per kilogram of pellets, and carrot bait material must be mixed at the rate of 6ml of product per kilogram of carrots.

Table 12. 1080 liquid concentrate mixing rates for rabbit baits

Mixing rate per kg of bait: Carrot - 6 mL of 1080 liquid concentrate to every kilogram of bait. Oats - 12 mL of 1080 liquid concentrate + 12 mL of water to every kilogram of bait. Pellets – 15ml of 1080 liquid concentrate + 15ml water to every kilogram of bait.				
Bait	Carrots	Oats	Pellets	
kg	1080 liquid conc. mL	1080 liquid conc. mL	1080 liquid conc. mL	Water mL
1	6	12	15	15
5	30	60	75	75
10	60	120	150	150
15	90	180	225	225
20	120	240	300	300
25	150	300	375	375
30	180	360	450	450
35	210	420	525	525
40	240	480	600	600
45	270	540	675	675
50	300	600	750	750

Pindone

Source: The EPA Pesticide Control Order that relates to Pindone Concentrate products.

Pindone bait material for rabbits

Definition of **'Pindone bait material'** means any carrot (diced into pieces roughly 2 centimetres cubed or 5 grams in weight), or any oats, that have been treated with pindone in accordance with the NSW directions on an approved label of the products "Rabbait Aqueous Pindone Concentrate", "ALDI Pindone 25 Liquid Concentrate" and "Pindone 25 Rabbit Bait Rodenticide" or any other pindone concentrate product that has been registered by the APVMA and approved for use in NSW and that can be used to control rabbits.

Pindone concentrate products for rabbits

Definitions:

- **'Pindone concentrate product'** means any concentrate product that contains pindone as its only active constituent, has been registered by the APVMA and approved, by way of label instruction, for use in NSW. It specifically includes the products "Rabbait Aqueous Pindone Concentrate", "ALDI Pindone 25 Liquid Concentrate" and "Pindone 25 Rabbit Bait Rodenticide".
- **'Pindone bait product'** means any non liquid formulation product that contains pindone as its only active constituent and that has been registered by the APVMA and approved for use in NSW. It also includes pindone bait material. It does not include the pindone concentrate products "Rabbait Aqueous Pindone Concentrate", "ALDI Pindone 25 Liquid Concentrate" and "Pindone 25 Rabbit Bait Rodenticide" or any other pindone concentrate product.

- **‘ALDI Pindone 25 Liquid Concentrate’** means the registered agricultural chemical product ALDI Pindone 25 Liquid Concentrate (APVMA Product Registration Number 52505) that has an active constituent comprising 25 grams of pindone present as the sodium salt per litre of product.
- **‘Pindone 25 Rabbit Bait Rodenticide’** means the registered agricultural chemical product Pindone 25 Rabbit Bait Rodenticide (APVMA Product Registration Number 48263) that has an active constituent comprising 25 grams of pindone sodium per kilogram of product.
- **‘Rabbait Aqueous Pindone Concentrate’** means the registered agricultural chemical product Rabbait Aqueous Pindone Concentrate (APVMA Product Registration Number 48158) that has an active constituent comprising 25 grams of pindone present as the sodium salt per litre of product.

Table 13. Pindone concentrate formulations and mixing rates.

Pindone concentrate	Supplier	Formulation	Mixing rates	Advantages	Disadvantages
Pindone-25 Rabbit Bait Rodenticide®	PAKS National	Powder 25 g/kg pindone sodium	200 g/20 kg carrots	Indefinite shelf life	Can only be used on carrots (not grains)
Rabbait® Aqueous Pindone Concentrate	Animal Control Technologies	Liquid 25 g/L pindone sodium	200 mL/20 kg carrots 200 mL/10 kg oats	Can be used on carrots and oats	Shorter shelf life than the powder formulation (shelf life can be extended by refrigeration)
Pindone 25® Liquid Concentrate	PAKS National	Liquid 25 g/L pindone sodium	200 mL/20 kg carrots 200 mL/10 kg oats	Can be used on carrots and oats	Shorter shelf life than the powder formulation (shelf life can be extended by refrigeration)

RHDV

Using a sterile syringe, reconstitute the RHDV K5 lyophilised virus by adding 10ml of sterile distilled water and swirl gently for a few minutes. Then dilute the reconstituted vial to a total volume of 100ml (add a further 90ml). Add the 100ml diluted suspension to 5kg of oats or 10kg of diced carrots in an enclosed mixer. Tumble for 3-5 minutes. Check that bait is completely coated.

Appendix G – Risk assessment guidelines

The following dot points should be considered as a guide only and does not cover every possible scenario that may need to be considered when undertaking a baiting program. When carrying out a risk assessment, the ACO must consider all known specific or local issues that may constitute a risk.

As part of the risk assessment process, the following situations may require additional control measures to be implemented in order for baiting to proceed

- Where the property is less than 100ha.
- Where the bait is to be used within closely settled areas.
- Where the bait is to be used in areas within 4 km of a village or street.
- Where coordinated group baiting control programs are being carried out (one risk assessment may be suitable for all landholders in the group).
- When the proposed program is ongoing or a replacement program greater than 3 months.
- When an ACO has concerns that the PCO requirements may not be able to be met.
- When there have been complaints or allegations of misuse of pesticides on the property from within the local community in the past.
- When replacement bait numbers exceed the LLS bait issuing guideline.

When a risk is identified, the ACO in consultation with the landowner/manager and authorised user (if different), must assess the risk and determine what control measures can be included in the program to reduce the risk to a medium or low level.

Note: A risk assessment is only valid for a maximum of 5 years (3 years for National Park Estates). A new risk assessment will be required sooner if circumstance occur that may change the risk rating. For example, this would include but not be limited to modifications like subdivision of a property or new residences on properties that are likely to have an impact on distance restrictions, new land managers or neighbours etc.

Risk Matrix

Extreme	Baiting must not proceed if risk is extreme or the PCO requirements cannot be met. Mandatory achievable and practical controls must be implemented to reduce the risk to medium. Follow up phone call should be made by ACO to ensure mandatory controls have been implemented.
High	Baiting must not proceed if risk is high. Mandatory achievable and practical controls must be implemented to reduce the risk. Emergency baiting - mandatory controls must be implemented to reduce the risk to medium as soon as practical. Normal baiting - mandatory controls must be implemented to reduce the risk to medium prior to commencement. Where baiting is regular or ongoing, permanent controls must be implemented. Follow up phone call may be made by ACO to ensure mandatory controls have been implemented
Medium	Baiting may be undertaken if risk is medium but must be monitored. Implement achievable and practical controls to reduce the likelihood if possible. Where baiting is regular or ongoing, permanent controls must be implemented.
Low	Proceed with baiting.

Likelihood		Consequences				
		Insignificant:	Minor:	Moderate:	Major:	Catastrophic:
Almost certain	Low (L)	Medium (M)	High (H)	Extreme (X)	Extreme (X)	
Likely	Low (L)	Medium (M)	High (H)	Extreme (X)	Extreme (X)	
Possible	Low (L)	Low (L)	Medium (M)	High (H)	Extreme (X)	
Unlikely	Low (L)	Low (L)	Low (L)	Medium (M)	High (H)	
Rare	Low (L)	Low (L)	Low (L)	Medium (M)	Medium (M)	

How to Prioritise the Risk Rating

Once the level of risk has been determined the table may be used in determining when to act to implement the control measures. For example this would include but not be limited to subdivision of a property, changes impacting distance restrictions, new land managers or neighbours etc.

Quantitative measures of consequence/impact

Insignificant: Very low risk to human safety, non-target animals or environment

Minor – Very low risk to human safety. Very little perceived or negligible impact to non-target animals or environment

Moderate – Human injury unlikely. Potential death of individual non target animals or injury to multiple non target animals eg: vet treatment required for domestic dogs. Potential for limited or negligible impact to environment

Major – Human injury likely to result with medical care required. Death to multiple non-target animals or some pets highly likely. High likelihood of environmental damage or pollution of soil and water

Catastrophic – Death or permanent disabling injury to humans. Broad scale death to non-target domestic animals/pets or threatened species. Significant environmental damage with detrimental effect, associated with significant financial loss

Qualitative measures of likelihood

Almost certain – This event will occur in most to all situations (about 90% of time)

Likely – This event is expected to occur more often than not, i.e. it will occur in the majority of situations (about 50-80% of time)

Possible – This event is more likely to not occur than occur (about 20-40% of time)

Unlikely – This event is not expected to occur more often than not i.e. it will not occur in the majority of situations (about 10-20% of time)

Rare – It is theoretically possible for this to occur, but it is expected to not occur in most to all situations (about 1% of time)

Definitions

Closely settled areas – Where 5 or more of the properties require notification, as they have a boundary within 1 km of the baiting location, are less than 50 ha.

Village or street – a locality that has a combination of a speed limit of 80km or less, street lights and zoned residential by local government.

Hazards/Risks	Yes	No	N/A	Risk level	Description of hazard or risk	Recommended control measures	New risk level	Detail how control measures will be implemented and any additional controls
Can distance restrictions be met?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>					
Presence of domestic pets?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>					
Presence of livestock?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>					
Presence of susceptible native animals?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>					
Close proximity to urban areas and townships	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>					
Risk to domestic or town water supplies?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>					
Other (please describe)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>					
Other (please describe)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>					
Other (please describe)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>					
Other (please describe)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>					

Appendix H – First aid for working dogs and other domestic animals

Although this advice is primarily for working dogs poisoned by 1080, the treatment for all domestic animals is the same. This advice is also applicable to poisoning by pindone, but the veterinary treatment will differ with the type of poison.

Reference: First Aid – 1080 and your dog (2004) Australian Wool Innovation Limited.

What are the risks of poisoning working dogs?

Wherever 1080 baiting is taking place, there is always a risk of accidental poisoning. Dogs may suffer accidental poisoning by eating baits, picking up baits that have been moved or relocated by other animals such as foxes, or eating dead animals that have been poisoned by 1080 baits.

Accidental poisoning can occur in the paddock or area being treated or in areas adjacent to the baited paddock, particularly if an animal or bird has moved or vomited up some 1080 bait.

Muzzle your dogs or keep them chained up while ever baits are likely to be active

How do I know my dog has been poisoned?

Dogs seen eating bait material or suspected of picking up bait material should be taken to a veterinarian as quickly as possible.

The time it takes for 1080 to work may be as little as 30 minutes to 2 hours before symptoms occur, depending on the dose. It is best to take action immediately rather than wait for the symptoms to appear. Quite often, once symptoms are evident it may be too late to save the animal.

Get to a vet ASAP

Signs to watch for are:

- anxiety
- frenzied behaviour such as running or howling
- hypersensitivity to sound or light
- failure to respond to owner
- vomiting
- urinating and defecating inappropriately.

and eventually:

- convulsions, seizures and fitting
- difficulty breathing
- respiratory failure
- coma
- death.

Inducing vomiting

Extreme care should be taken when inducing vomiting, as the dog may react violently and expose toxic vomit, which can cause secondary poisoning of other domestic animals.

You should induce vomiting when:

- you have seen your dog eat a bait or a poisoned carcass
- there is a likely delay before veterinary assistance is available.

Just because the dog has vomited does not mean all the poison is out of the stomach. Still seek veterinary attention.

What can I use?

- Table salt, 1 to 3 tablespoons orally.
- Salty water.

When using 1080 it is advisable to have a small plastic drink bottle with 30 to 50 g of salt and 250 mL water handy at all times.

Ensure no other animal has access to the vomit, as they will be poisoned as well.

What else can I do?

- Call your local veterinary clinic and advise you are bringing in the animal.
- Put the dog in a box or other space that restricts movement to prevent it from injuring itself.
- If the dog is convulsing or fitting, keep your fingers clear of its mouth; it will not swallow its tongue.
- Keeping the dog cool by spraying lightly with water or giving a good flow of air may help.

Appendix I – Sensitivities of various animals to pindone, strychnine and 1080

Pesticides used in the management of Vertebrate pests in Australia: A Review; Lynette Mcleod and Glen Saunders, NSW Department of Primary Industries, August 2013.

Pindone

Table 14. The acute and chronic oral sensitivity to pindone for a range of species expressed as the median lethal dose (LD₅₀).

Species	Acute LD ₅₀ (mg/kg)	Reference	Chronic LD ₅₀ (mg/kg/day)	Reference
Introduced mammals				
Brown rat, <i>Rattus norvegicus</i>	>50	(Saunders et al. 1955)	–	–
Rabbit, <i>Oryctolagus cuniculus</i>	25	(Eason and Joll 1993)	0.52 for 7 days	(Oliver and Wheeler 1978, Martin <i>et al.</i> 1994)
Sheep, <i>Ovis aries</i>	>74	(Twigg et al. 1999)	> 50 for 7 days	(Oliver and Wheeler 1978)
Cattle, <i>Bos primigenius</i>	–	–	2 for 3 days	(Twigg et al. 1999)
Pig, <i>Sus scrofa</i>	>10	(Twigg et al. 1999)	–	–
Cat, <i>Felis catus</i>			1.0–1.25 for 4 for days	(Twigg et al. 1999)
Dog, <i>Canis lupus familiaris</i>	75–100	(Beauregard et al. 1955)	2.5 for 6–14 days	(Beauregard et al. 1955)
Native mammals				
Brush-tail possum, <i>Trichosurus vulpecula</i>	>100	(Eason and Jolly 1993)	51 for 5 days	(Jolly et al. 1994)
Western grey kangaroo, <i>Macropus fuliginosus</i>	–	–	1–2 for 7–14 days	(Twigg et al. 1999)
Introduced birds				
Chicken, <i>Gallus gallus domesticus</i>	–	–	2.5 for 4 days	(Twigg et al. 1999)
Native Birds				
Australian magpie, <i>Gymnorhina tibicen</i>	–	–	4 for 5 days	(Martin et al. 1994)
Wedge-tailed eagle, <i>Aquila audax</i>	–	–	0.25 for 5 days	(Martin et al. 1994)

Strychnine

Table 15. The sensitivity to strychnine for a range of species expressed as the oral median lethal dose (LD₅₀). The amount of strychnine is calculated using the average male body weights derived from (McIlroy 1984, Strahan 1991).

Species	Oral LD ₅₀ (mg/kg)	Av body weight (kg)	Amount for LD ₅₀ (mg)	Reference (LD ₅₀ data)
Introduced mammals				
Mouse, <i>Mus musculus</i>	2.0 ^a	0.02	0.04	(Prasad et al. 1981)
Brown rat, <i>Rattus norvegicus</i> (lab. strain)	2.35–6.5 ^b 2.6–6.5 ^c 5 ^{c, d}	0.32	0.75–2.08 0.83–2.08 1.6	(Ward and Crabtree 1942, Schafer 1972) (Fitzwater and Prakash 1973)
Brown rat, <i>Rattus norvegicus</i> (wild strain)	4.8 ^c	0.32	1.54	(Dieke and Richter 1946)
Rabbit, <i>Oryctolagus cuniculus</i>	0.6 ^b LD 6.5	1.6	0.96 10.4	(Fitzwater and Prakash 1973) (Lazarus 1956)
Cattle, <i>Bos primigenius</i>	LD 1.5 ^a	500	750	(Clarke 1976)
Horse, <i>Equus caballus</i>	LD 1.0 ^a	700	700	(Clarke 1976)
Pig, <i>Sus scrofa</i>	0.5–1.0 ^a 150–300 ^{c, d}	70	35–70 10,500– 21,000	(Buck 1978) (Fitzwater and Prakash 1973)
Cat, <i>Felis catus</i>	2.0 ^a 0.75 ^b 0.5 ^c	5.0	10.0 3.75 2.5	(Buck 1978) (Fitzwater and Prakash 1973) (Moraillon and Pinault 1978)
Dog, <i>Canis lupus familiaris</i>	0.75 ^b 0.5 ^c 75–300 ^{c, d}	16.0	12.0 8.0 1200– 4800	(Buck 1978) (Moraillon and Pinault 1978) (Fitzwater and Prakash 1973)
Human, <i>Homo sapiens</i>	1–30 ^a	70	70–2100	(Gratz 1973) (Fitzwater and Prakash 1973)
Native mammals				
Brushtail possum, <i>Trichosurus vulpecula</i>	22.4 ^a	3.5	78.4	(Bell 1972)
Introduced birds				
Chicken, <i>Gallus gallus domesticus</i>	5.0 ^a 18.5–30.0 ^c 30–40 ^a	2.8	14 51.8–84 84–112	(Buck 1978) (Heinekamp 1925) (Fitzwater and Prakash 1973)
Mallard duck, <i>Anas platyrhynchos</i>	2.9 ^b	1.2	3.5	(Tucker and Haegele 1971)
Ring-necked pheasant, <i>Phasianus colchicus</i>	24.7 ^b	1.2	29.6	(Tucker and Haegele 1971)
Domestic pigeon, <i>Columba livia</i>	8–11 7.7–21.3 ^b 30 ^c	0.27	2.2–3.0 2.1–5.8 8.1	(Fitzwater and Prakash 1973) (Tucker and Haegele 1971, Schafer and Eschen 1986) (Heinekamp 1925)
English sparrow, <i>Passer domesticus</i>	4.2 ^b 7.4 ^a	0.03	0.12 0.22	(Tucker and Haegele 1971) (Bird 1995)
Starling, <i>Sturnus vulgaris</i>	<5.0 ^c	0.07	0.35	(Schafer 1972)
^a Form not stated, ^b Alkaloid, ^c Sulphate, ^d Hydrochloride.				

Table 16. The sensitivity to 1080 for a range of species expressed as the oral median lethal dose (LD₅₀). The amount of 1080 is calculated using the average male body weights derived from (McIlroy 1984, Strahan 1991). Species from areas containing fluoroacetate-bearing plants are indicated with an “*”.

Species	LD ₅₀ (mg/kg)	Av body weight (kg)	1080 Amount for LD ₅₀ (mg)	Reference (LD ₅₀ data)
Introduced mammals				
Mouse, <i>Mus musculus</i>	8.33	0.02	0.17	(McIlroy 1982b)
Brown rat, <i>Rattus norvegicus</i> (lab. strain)	1.71–2.5	0.32	0.55–0.8	(Kalmbach 1945, McIlroy 1982b)
Brown rat, <i>Rattus norvegicus</i> (wild strain)	0.22–5.0	0.32	0.07–1.6	(Kalmbach 1945, Dieke and Richter 1946)
Black rat, <i>Rattus rattus</i>	0.1–0.76	0.28	0.03–0.22	(Kalmbach 1945, McIlroy 1982b)
Rabbit, <i>Oryctolagus cuniculus</i>	0.34–0.50	1.6	0.54–0.80	(Lazarus 1956, McIlroy 1982a)
Rabbit, <i>Oryctolagus cuniculus</i> *	0.49–1.02	1.6	0.78–1.6	(Wheeler and Hart 1979, Twigg et al. 2002)
Sheep, <i>Ovis aries</i>	0.25–0.52	50	12.5–26	(Meldrum et al. 1957, Annison et al. 1960, McIlroy 1982a)
Goat, <i>Capra hircus</i>	0.6–0.7 IM	58	34.8–40.6	(Chenoweth and Gilman 1946, Ward 1946)
Cattle, <i>Bos primigenius</i>	0.22–0.39	500	110–195	(Robison 1970)
Horse, <i>Equus ferus caballus</i>	0.35–1.0	700	245–700	(Ward 1946, Tucker and Crabtree 1970, Tomlinson and Gooding 1971)
Pig, <i>Sus scrofa</i>	1–1.04	70	70–72.8	(McIlroy 1983a)
Cat, <i>Felis catus</i>	0.07–0.49	5.0	0.35–2.4	(McIlroy 1981b, Eason and Frampton 1991)
Fox, <i>Vulpes vulpes</i>	c. 0.15	6.5	0.98	(McIlroy and King 1990)
Dog, <i>Canis lupus familiaris</i>	0.06–0.35	16.0	0.96–5.6	(Kalmbach 1945, Tourtellotte and Coon 1951, Tomlinson and Gooding 1971)
Human, <i>Homo sapiens</i>	2.0–5.0	70	140–350	(Ward 1946, Chenoweth 1949, Tomlinson and Gooding 1971)
Native mammals				
Fat-tailed dunnart, <i>Smiththopsis crassicaudata</i>	2.06	0.015	0.03	(McIlroy 1981b)
Brown antechinus, <i>Antechinus stuartii</i>	1.85	0.035	0.06	(McIlroy 1981b)
Bush rat, <i>Rattus fuscipes</i>	1.13	0.125	0.14	(McIlroy 1982b)
Bush rat, <i>Rattus fuscipes</i> *	36–40	0.125	4.5–5.0	(Oliver et al. 1977, King et al. 1978)
Brushtail possum, <i>Trichosurus vulpecula</i>	0.47–0.79	3.5	1.6–2.8	(Bell 1972, McIlroy 1982a)
Brushtail possum, <i>Trichosurus vulpecula</i> *	> 100	3.5	>350	(Oliver et al. 1977, King et al. 1978)
Brown bandicoot, <i>Isodon obesulus</i>	c. 7	0.85	6.0	(McIlroy 1983b)
Brown bandicoot, <i>Isodon obesulus</i> *	20	0.85	17	(Twigg and King 1991)
Long-nosed bandicoot, <i>Perameles nasuta</i>	7.70	0.98	7.5	(McIlroy 1981b, 1983b)
Common wombat, <i>Vombatus ursinus</i>	0.2	26	5.2	(McIlroy 1982a)
Agile wallaby, <i>Macropus agilis</i> *	0.2	19	3.8	(Oliver et al. 1977)
Eastern grey kangaroo, <i>Macropus giganteus</i>	0.1–0.35	40	4–14	(McIlroy 1982a)
Red kangaroo, <i>Macropus rufus</i>	2.0	37	74	(King et al. 1978)

Species	LD ₅₀ (mg/kg)	Av body weight (kg)	1080 Amount for LD ₅₀ (mg)	Reference (LD ₅₀ data)
Northern quoll, <i>Dasyurus hallucatus</i>	5.66	0.7	4.0	(Mcllroy 1981b)
Spotted-tail quoll, <i>Dasyurus maculatus</i>	1.85	5.0	9.3	(Mcllroy 1981b)
Dingo, <i>Canis familiaris dingo</i>	0.11	16.0	1.8	(Mcllroy 1981b)
Introduced Birds				
Chicken, <i>Gallus gallus domesticus</i>	5.9–10	2.8	16.5–28	(Kalmbach 1945, Ward and Spencer 1947, Tomlinson and Gooding 1971)
Mallard duck, <i>Anas platyrhynchos</i>	9.11	1.2	10.9	(Tucker and Crabtree 1970, Tucker and Haegele 1971)
Ring-necked pheasant, <i>Phasianus colchicus</i>	6.46	1.2	7.8	(Tucker and Crabtree 1970, Tucker and Haegele 1971)
Domestic pigeon, <i>Columba livia</i>	2.5–9.0	0.27	0.68–2.4	(Ward and Spencer 1947, Tomlinson and Gooding 1971, Tucker and Haegele 1971)
English sparrow, <i>Passer domesticus</i>	3.00	0.03	0.09	(Tucker and Crabtree 1970, Tucker and Haegele 1971)
Native Birds				
Australian magpie-lark, <i>Grallina cyanoleuca</i>	8.83	0.95	8.4	(Mcllroy 1984)
Australian magpie, <i>Gymnorhina tibicen</i>	9.93	0.32	3.2	(Mcllroy 1984)
Pied currawong, <i>Strepera graculina</i>	13.09	0.31	4.1	(Mcllroy 1984)
Pacific black duck, <i>Anas superciliosa</i>	18.91	0.98	18.5	(Mcllroy 1984)
Wood duck, <i>Chenonetta jubata</i>	12.6	0.74	9.3	(Mcllroy 1984)
Galah, <i>Cacatua roseicapilla</i>	5.53	0.33	1.8	(Mcllroy 1984)
Kookaburra, <i>Dacelo novaeguineae</i>	c. 6.0	0.28	1.7	(Mcllroy 1984)
Australian raven, <i>Corvus bennetti</i>	c. 5.1	0.61	3.1	(Mcllroy 1984)
Little crow, <i>Corvus bennetti</i>	13.37	0.39	5.2	(Mcllroy 1984)
Black kite, <i>Milvus migrans</i>	18.51	0.59	10.9	(Mcllroy 1984)
Wedge-tailed eagle, <i>Aquila audax</i>	9.49	3.26	31	(Mcllroy 1984)
Emu, <i>Dromaius novaehollandiae</i>	c. 278	26.5	7,367	(Mcllroy 1984)
Amphibians and reptiles				
Spotted grass frog, <i>Limnodynastes tasmaniensis</i>	c. 60	0.01	0.6	(Mcllroy et al. 1985)
Bearded dragon, <i>Pogona barbatus</i>	<110	475	<52250	(Mcllroy et al. 1985)
Blotched blue tongue lizard, <i>Tiliqua nigrolutea</i>	336.4	0.75	252	(Mcllroy et al. 1985)
Sand goanna, <i>Varanus gouldii</i>	43.6–50	5	218–250	(Mcllroy et al. 1985)
Lace monitor, <i>Varanus varius</i>	100–119	4.3	430–512	(Mcllroy et al. 1985)
Fish				
Rainbow trout, <i>Oncorhynchus mykiss</i>	50	–	–	(Bauermeister et al. 1977)

PAPP

Table 17. The sensitivity to PAPP for a range of species expressed as the oral median lethal dose (LD₅₀). The amount of PAPP is calculated using the average male body weights derived from (McIlroy 1984, Strahan 1991).

Species	LD ₅₀ (mg/kg)	Av body weight (kg)	PAPP Amount for LD ₅₀ (mg)	Reference (LD ₅₀ data)
Introduced mammals				
Mouse, <i>Mus musculus</i>	168-233 >5000	0.02	3.4-4.7 100	(Pan et al. 1983, Savarie et al. 1983)
Brown rat, <i>Rattus norvegicus</i> (lab. strain)	144 ^a 177-475	0.32	46.1 56.6-152	(Scawin et al. 1984)
Ferret, <i>Mustela putorius furo</i>	15.5	2.0	31	(NWR 2006)
Stoat, <i>Mustela erminea</i>	9.3 37-95	0.4	3.7 14.8-38	(Pan et al. 1983, Savarie et al. 1983, Scawin et al. 1984)
Cat, <i>Felis catus</i>	5.6 20-30	5.0	28 100-170	(Fisher and O'Connor 2007)
Fox, <i>Vulpes vulpes</i>	<25.2 15.4 ^a	6.5	<164 100	(Fisher et al. 2005)
Dog, <i>Canis lupus familiaris</i>	26-43	16.0	416-688	(Murphy et al. 2007)
Native mammals				
Fat-tailed dunnart, <i>Smithnopsis crassicaudata</i>	105a	0.015	1.6	(NWR 2006)
Brown antechinus, <i>Antechinus stuartii</i>	>571a	0.035	>20.0	(NWR 2006)
Bush rat, <i>Rattus fuscipes</i>	697a	0.125	87.1	(NWR 2006)
Brush-tail possum, <i>Trichosurus vulpecula</i>	>500 615 ^a	3.5	>1750 2153	(Fisher et al. 2008) (NWR 2006)
Brown bandicoot, <i>Isodon obesulus</i>	6.4 ^a	0.85	5.4	(NWR 2006)
Tammar wallaby, <i>Macropus eugenii</i>	89	5	445	(Fisher et al. 2008)
Tasmanian devil, <i>Scarcophilus harrisi</i>	120 ^a	8	960	(NWR 2006)
Spotted-tail quoll, <i>Dasyurus maculatus</i>	24.8 ^a	5.0	124	(NWR 2006)
Dingo, <i>Canis familiaris dingo</i>	8.5 ^a	16.0	136	(NWR 2006)
Introduced Birds				
Mallard duck, <i>Anas platyrhynchos</i>	32-38	1.2	38.4-45.6	(Fisher et al. 2008, Eason et al. 2010)
Starling, <i>Sturnus vulgaris</i>	>316	0.07	22.1	(Savarie et al. 1983)
Native Birds				
Australian magpie, <i>Gymnorhina tibicen</i>	1387	0.32	444	(Eason et al. 2010)
Little Australian raven, <i>Corvus coronoides</i>	130a	0.61	79.3	(NWR 2006)
Silver gull, <i>Larus coronoides</i>	>1000 ^a	0.29	>290	(NWR 2006)
Native Reptiles				
Rosenberg's goanna, <i>Varanus rosenbergis</i>	12	1.1	13.2	(Frappell and Andrewartha 2006)
Lace monitor, <i>Varanus varius</i>	3	4.3	12.9	(Frappell 2007)

^a Calculated 80% increase in methaemoglobin concentrate which was found to strongly correlate with LD50 values (NWR 2006)

Appendix J – Example forms for indemnity, landholder consent, bait collection and baiting notification



Local Land
Services

CONSENT FORM RE USE OF '1080' POISON WILD DOG BAIT POISON LAID BY THE AGENCY

I _____
(Print Name)

Of _____
(Residential Address)

Being owner/occupier of the property known as _____
(Property Address)

with Holding Reference # _____ do hereby consent to an officer of the North Coast
Local Land Services being _____,
(NC LLS Officer)

laying '1080' poisoned bait material on that portion of the property described hereunder.

I agree to indemnify and keep indemnified at all times the North Coast Local Land Services, its Board, its Directors, Officers, Servants and Agents against all actions, proceedings, claims, demands, costs and expenses whatsoever in respect of injury to any person, loss of any animal or any other loss whatsoever which may have occurred in the use by me and/or my agents or employees of '1080' poison bait material

Description of Area:

Property Name: _____

Description of Property/paddock name/whole property: _____

Area being baited: _____ Number of baits used: _____

My nominee (if applicable): _____

Dated this _____ day of _____ 20____

Signature of owner/occupier _____

Witness _____

Pesticide Control Order issued and read by the owner/occupier of the property.

Signs issued

Office Use Only

FARMS 1080 Register

**INDEMNITY FORM FOR USE OF 1080 OR PAPP POISONED BAIT OR EJECTOR CAPSULE
RECEIVED BY AUTHORISED PERSON/NOMINATED PERSON**

I, of
(print name) (residential address) (state) (post code)

being the nominated person for being a person authorised to use 1080/PAPP
(delete if authorised person[^] collects) (print name authorised person)

Card type number expiry/...../..... Risk Assessment #.....
(Training provider)

for the holding known as Holding Reference #.....
(holding name where baiting will occur) (FARMS)

in the locality of acknowledge that I have received the following information relating to
(District/LGA)
 the safe use of 1080 or PAPP poisoned baits or ejector capsules, from an Officer of XXXXXX Local Land Services.

- An electronic / printed* copy of the Pesticide Control Order (PCO) and relevant Schedule relating to
 - **1080 or PAPP**
• (circle appropriate poison)
 - **Bait or Ejector**
• (circle appropriate delivery method)
 - **Wild Dog or Fox or Feral Pig or**
• (circle appropriate pest animal)

which sets out in detail the directions for use of 1080 or PAPP baits or ejectors.

The authorised person is aware that:

1. All baits or ejector capsules must be laid in accordance with the label and relevant PCO.
2. There are requirements under the NSW Pesticides Act 1999 that must also be complied with.
3. They must comply with any mandatory control measures identified in the Risk Assessment.

by means specified in the relevant PCO, the notification requirements will be met for every landholder whose property boundaries are within one (1) kilometre of the intended baiting location/s.

this is an emergency baiting for wild dog or fox.

Landholders within 1 km of baiting location

.....

The baiting location being an area or length
(description, e.g. paddock name, whole property)
 of ha/km*. I acknowledge having received of prepared baits.
(weight or number) (bait type/ejector capsule)

This includes baits / ejector capsules for replacement baiting over the next weeks.
(number) (number)

I have received relevant signs to identify the baiting location/s.
(number)

In consideration of the Local Land Services supplying me with such poisoned bait material or ejector capsules, the authorised person accepts full responsibility for the transportation, handling, storage and use of the said bait material or ejector capsule and agrees to indemnify and keep indemnified at all times the Local Land Services, its Board, its Directors, Officers, Servants and Agents and the said Agency and Contractor, against all actions, proceedings, claims, demands, costs and expenses whatsoever in respect of injury to any person, loss of any animal or any other loss whatsoever which may have occurred in the use by me and/or my agents or employees in the use of bait material or ejector capsules.

Dated this day of 20.....

Signature of authorised person[^]/nominated person.....

Officer of LLS (name) (signature)

Baits approved by ACO (name) (signature)
(If approving ACO not signing as Officer of LLS)

* Strike out which ever doesn't apply | [^]As defined under Authorised persons in the Pesticide Control Order

Office use
 FARMS training updated (staff initials) Invoice number

**New South Wales, National Parks and Wildlife Service (NPWS)
1080 poisoned bait/ capsules provided by NPWS
Authorised Control Officer (ACO) for control of feral
species**



I, _____
(print name)

being the authorised agent for the NSW National Parks and Wildlife Service, hereby acknowledge that I have received the following information relating to safe use of 1080 poisoned baits/ capsules, from an Authorised Control Officer (ACO) of the NPWS:

1. a copy of the relevant Pesticide Control Order (PCO);
2. a copy of the ACO Risk Assessment with map attached. CM9 Document Number: _____
3. a copy of this indemnity form that I have signed, and
4. I accept full responsibility for transport, handling, storage and use of the **1080** products issued

I have read and understand the contents of the relevant **Pesticide Control Order** referenced above, as well as the NPWS ACO Risk Assessment with map attached. I agree that I will comply with these documents.

The 1080 baits being supplied are for BPMS program name / Park Estate / AMS equipment no/

Property:

I acknowledge having received:

Fox (3mg 1080)		Wild dog (6 mg 1080)		Other species	
Bait type/capsule	Amount	Bait type/capsule	Amount	Bait type	Amount

Signature of person authorised to collect 1080 products **AQF3 accreditation No. and expiry**

_____ Names of other officers or contractors with access to 1080 products¹	_____ AQF3 accreditation No. and expiry
_____	_____
_____	_____
_____	_____

_____ NPWS Authorised Control Officer (name and signature)	_____ Date
--	----------------------

¹ Contractors who are being issued with baits (i.e. taking possession) must sign a separate indemnity form.



NOMINATED PERSON and AUTHORISED AGENT FORM

Authorisation

I, _____ of _____
(Print Name) (Resident Address)

authorise _____ of _____
(Print Name) (Resident Address)

to act as my nominated person/authorised agent* and collect and lay* 1080 baits from the North Coast Local Land Services on my behalf.

Signed _____ Date _____

Chemical Qualification

Owner The owners chemical card will be used

Other Please complete the following details

Name _____ Card Type _____

Card # _____ Expiry Date _____

Property Details

Property Owner: _____

Property Name: _____

Property Address: _____

Area to be baited: _____ Reference #: _____

Names of Neighbours within 1km of property being baited: _____

*Strike out as required



Wild Dog Baiting Notification

This notification is to advise all landholders within 1 kilometre of 'Owners Name' property, 'Property name' & 'Property Address', that 1080 (sodium fluoroacetate) wild dog bait's will be laid on the above mentioned property from the / / to / /
Ongoing program (Delete if not applicable)

Property owners are warned their domestic pet and working dogs may be affected. Seek veterinary advice in the event of poisoning. 1080 poisoned baits will be laid in accordance with the current 1080 Pesticide Control Order under Section 38 *Pesticides Act 1999*. Additional requirements may be imposed by NCLLS.

For further information contact: (Person who lay's baits name and contact number, as per PCO)

Name and contact for ACO can be added if required.



Wild Dog Baiting Notification

This notification is to advise all landholders within 1 kilometre of 'Owners Name' property, 'Property name' & 'Property Address', that 1080 (sodium fluoroacetate) wild dog bait's will be laid on the above mentioned property from the / / to / /
Ongoing program (Delete if not applicable)

Property owners are warned to keep their domestic pet and working dogs may be affected. Seek veterinary advice in the event of poisoning. 1080 poisoned baits will be laid in accordance with the current 1080 Pesticide Control Order under Section 38 *Pesticides Act 1999*. Additional requirements may be imposed by NCLLS.

Appendix K – Local Land Service - Risk assessment and bait placement requirements.

Wild dogs and foxes

Baiting area

Identify which part of the holding the landholder wants to lay baits and areas excluded from baiting due to distance restrictions from requirements listed in the current 1080 PCO. This may be less than the total area of the property and is identified by overlaying the relevant part of the holding the landholder wants to bait and distance restrictions on a property map. The area remaining is the actual area being baited and is used to calculate maximum bait numbers that can be laid at any one time. The maximum number of baits issued for trail baiting cannot exceed the total baits allowed for the area being baited. Following a suitable risk assessment, an ACO may issue 1 bait to a holding where the bait area is less than 5ha. A single bait can be issued for each additional 5ha portion (or part thereof) for the balance of the assessed baiting area. The ACO can determine the number of replacement baits also issued to achieve effective control.

Risk Assessments

Once risks are identified there are a number of measures that can be used to reduce the risk to a suitable level. The list below highlights examples of these but does not necessarily cover every situation.

1. Reduce number of baits below maximum number allowed as calculated by size of the actual area being baited, e.g. area being baited is 50ha which allows 10 baits, reduce bait number to 5.
2. Mandatory to bury or tether baits.
3. Define the type of bait. This may reduce non target uptake.
4. Define neighbour notification requirements, e.g. require letterbox drop as opposed to notification in local newspaper. This ensures that all neighbours receive notification.
5. Increase signage requirement to every 1km on road fence (PCO requires 5km).
6. Reduce the time baits can be left on property, e.g. For properties less than 100 ha, baits must be collected after 5 days.

Bait Placement

The placement of bait is a key factor in successful wild dog and fox control programs. Baits should be focused on pathways used by wild dogs and foxes as this has the potential to not only reduce the number of baits required to obtain successful control but also reduce the workload of landholders carrying out programs.

When to bait

In order to minimise impacts on livestock and native animals taking a strategic approach is best. Strategic baiting programs are best carried out from autumn to spring.

Identifying bait sites

1. Identify pathways. Wild dog footprints and scats.
2. Identify areas where wild dogs are likely to travel, eg, ridge lines, drainage lines, animal pads etc.
3. Identify intersecting travel paths to maximize exposure to baits.
4. Note bait sites that have baits removed. It could be expected that these animals will have been killed by the bait but future animals are likely to travel the same pathways.

Laying baits

It is essential to place baits to minimise the risk of bait movement and caching. Exposed baits are readily moved by birds.

Bait station – A mound of loose soil approximately 15cm high. Baits buried 10cm below the top of the mound. This not only helps to identify where the baits are placed but also reduces the risk of bait removal by non-targets.

Buried bait – Hole dug approximately 10cm deep with mattock, setter or shovel and bait placed in hole and covered.

Covered bait – Bait placed leaf litter or grass mimicking a cached bait

1. Only lay one bait per site. It only takes one bait to kill a wild dog or fox and also reduces the risk of caching of baits by foxes.
2. Distribute bait sites across the identified pathways. This will help decrease the likelihood of one animal picking up multiple baits.
3. Inspect bait sites every 3-4 days. If baits are showing signs of deterioration remove baits and dispose of as required by the PCO.
4. Consider ongoing baiting programs over a number of months. This will help to ensure lethal baits are available should wild dogs or foxes move through the property.

Higher density baiting (greater than 1 per 5ha, 1 per 100m) is permitted to target higher likelihood areas for bait take but increased risk of caching is a consideration when allowing this. This does not increase the total number of baits that can be issued for the program.

Rabbits and Feral Pigs

Baiting area

Identify which part of the holding the landholder wants to lay baits and areas excluded from baiting due to distance restrictions from requirements listed in the PCO. This may be less than the total area of the property and is identified by overlaying the relevant part of the holding the landholder wants to bait and distance restrictions on a property map. The amount of bait to be laid will be determined by free feeding which must be carried out on at least three occasions prior to baiting with 1080 baits.

Risk Assessments

Once risks are identified there are a number of measures that can be used to reduce the risk to a suitable level. The list below highlights examples of these but does not necessarily cover every situation.

1. Define when bait can be put out, e.g. put out at dusk, picked up at dawn (reduce possibility of grain uptake by birds, domestic dogs eating carrot)
2. Define the type of bait. This may reduce non target uptake
3. Define delivery method – pigs; e.g. bait station, hog hopper, pipe feeder, under conveyor belt, buried, etc. – rabbits; trail, broadcast, under mesh covers, etc.
4. Define neighbour notification requirements, e.g. require letterbox drop as opposed to notification in local newspaper. This ensures that all neighbours receive notification.
5. Increase signage requirement to every 1km on road fence (PCO requires 5km)
6. Secondary poison risk to domestics. Require carcasses to be removed at dawn daily.

Bait Placement

The placement of bait is a key factor in successful rabbit and feral pig control programs. Baits should be focused on areas where feral pig and rabbits are feeding and this is further identified during the free feeding process.

When to bait

In order to minimise impacts on livestock and native animals taking a strategic approach is best. Where possible targeting periods when natural feed is less available will improve uptake of poisoned baits and improve efficacy of programs.

Appendix L – ACO to ACO restricted chemical product transfer record (LLS to other agency)

LLS ACO name: _____

Date	RCP concentrate (1080, pindone RHDV etc)	Prepared bait (meat, foxoff, carrot etc.)	Quantity (mls/No.)	Other agency ACO transferred to (name)	Signature of ACO taking delivery

Appendix M – Feral pig approved delivery devices.

Field use of approved feral pig delivery device for 1080

Under the current 1080 PCO (Schedule 3) feral pig baiting using an approved delivery device allows for extended presentation of 1080 bait in the field. In order to be approved as a feral pig delivery device field trials must demonstrate both target selectivity and effectiveness of the pig control device under closely monitored field conditions prior to endorsement.

Risk assessment and signage for use of approved feral pig delivery device

- A risk assessment must be undertaken for use of an approved feral pig delivery device. Risk assessments must be approved by a ACO.
- The ACO risk assessment should identify use of remote cameras to monitor both non-target and target species behaviour during the nominated feed period.
- Signage must be present at the location of the feral pig delivery device. Containers holding 1080 bait material must be clearly labelled “1080 Poison” in large red letters. A 1080 Feral Pig poisoning notice must be present at each feral pig delivery device site.

Approved delivery devices 1080

Pest Lures

Hogmat - <https://www.pestlures.com.au/pages/hogmat-standard-operating-procedure>

ACTA

Hoghopper - <https://animalcontrol.com.au/products/hoghopper-bait-delivery-system>

Sodium nitrite

Hoggone bait box - <https://animalcontrol.com.au/products/hoggone-mesn-feral-pig-bait-box>