

# Regulatory Impact Statement

## Proposed Pesticides Regulation 2009

Department of **Environment & Climate Change** NSW





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ISBN 978 1 74232 152 3

DECC 2009/131

February 2009

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## Summary

The *Pesticides Act 1999* controls the use of pesticides in New South Wales. The Act aims to reduce the risks to human health, the environment, property, industry and trade from the use of pesticides. The Pesticides Regulation 1995 facilitates this by setting out requirements for pesticide record-keeping, training and the notification of pesticide use. The Department of Environment and Climate Change (DECC) is currently remaking the Regulation, which is due for repeal on 1 September this year.

As required by the *Subordinate Legislation Act 1989*, DECC has prepared this Regulatory Impact Statement (RIS) which analyses a proposed replacement, the Pesticides Regulation 2009. This is also in line with the NSW Government's 'better regulation requirements' (NSW Government 2008).

The RIS describes a number of issues relating to pesticide use in NSW and identifies how the proposed Regulation would continue to cost-effectively protect human health, the environment, property, industry and trade.

A substantial part of the existing Pesticides Regulation has been introduced within the last few years, so much of its content is relatively new. The Regulation has also been reviewed on a regular basis, allowing existing provisions to be updated and amended as required. Consequently, major changes to the current Regulation are not considered necessary: rather, at this time, the changes proposed seek to streamline the Regulation's operation so that it is both more effective and efficient.

Substantial amendment to the Pesticides Regulation is also considered inappropriate now following the recent request by the Council of Australian Governments for a single national framework to regulate agricultural and veterinary chemicals in Australia. This proposal is to be considered in the first half of 2010.

The RIS canvasses three options: the base case where the Regulation is allowed to lapse; the proposed Regulation; and self-regulation of pesticide use. A cost-benefit analysis indicates that there are likely to be significant benefits to the community, industry and government from training pesticide users and requiring record-keeping and notification of pesticide use. A range of costs is also involved in complying with and administering the Regulation.

While the benefits are identified and described in the RIS, some are difficult to quantify. For example, the proposed Regulation is expected to provide the following unquantified benefits:

- reduced incidence of environmental impacts from pesticide use
- lower costs to industry from pest resistance to chemicals
- less risk of adverse impacts on trade due to improved compliance with the Pesticides Act and fewer violations of residue limits in food and produce
- reduced risk of lower agricultural value from residue violations or crop losses from overuse or underuse of pesticides.

As a result, allowing the Regulation to lapse and remaking the Regulation both present a net quantifiable cost to society. A meaningful estimation of the costs and benefits of the self-regulation option was not possible, however, given great uncertainty about the levels of compliance with such a regime.

Both the base case and self-regulation are expected to result in significantly less training, notification and record-keeping, all likely to undermine the appropriate use of pesticides in NSW and result in diminished human and environmental health.

The proposed Regulation is likely to provide a net benefit to society and is the preferred option for replacing the current Regulation when it is repealed on 1 September 2009.

## 1. Introduction

The NSW Pesticides Regulation 1995 facilitates the operation of the State's *Pesticides Act 1999*. The Regulation works to protect human health, the environment, property, industry and trade from the effects of pesticide use.

The Department of Environment and Climate Change (DECC) has reviewed the existing Regulation in preparation for its repeal on 1 September this year. As a result of this, it is proposed to remake the Regulation and include a small number of amendments to update and streamline its operation.

### 1.1 Purpose and content of the Regulatory Impact Statement

The *Subordinate Legislation Act 1989* provides for the staged repeal of statutory rules, including Regulations, every five years. Under the program of staged repeal, Regulations which are due for repeal may:

- be allowed to lapse
- be remade with major or minor amendments
- have their repeal postponed by one year if exceptional circumstances exist.

The Pesticides Regulation is due to lapse in September 2009. Before the Pesticides Regulation can be remade, DECC is required to prepare a Regulatory Impact Statement (RIS) to assess the economic, social and environmental costs and benefits of any replacement Regulation and its alternatives. This is designed to ensure that the proposed Pesticides Regulation provides the best approach for achieving its desired objective. The RIS must provide justification for the proposed Pesticides Regulation by showing that it will result in the greatest net benefit or least cost to the community compared with the alternatives. It must also conform to the NSW Government's 'better regulation requirements' (NSW Government 2008).

Permission was granted on several occasions to postpone the repeal of the existing Regulation until 1 September 2009. These postponements recognised that a substantial part of the Regulation had been made over the last few years as part of the significant pesticides implementation reform program initiated by the then Minister for the Environment in 1999. Much of the content of the current Regulation is therefore relatively new. Further, with each amendment, regular review allowed existing provisions to be updated where necessary, minimising the need to make major changes at this time.

Major changes are also considered inappropriate now because of substantial developments at the national level. As a result of recommendations from the Productivity Commission's Research Report into Chemicals and Plastics Regulation in July 2008, the Council of Australian Governments (COAG) requested that the Primary Industries Ministerial Council bring forward a proposal for a single national framework to improve the efficiency and effectiveness of the regulation of agricultural and veterinary chemicals. The outcomes of this process are expected to lead to future changes to the NSW *Pesticides Act 1999* and any Pesticides Regulation in force at that time.

### 1.2 Preliminary consultation

There has been considerable consultation with key stakeholders prior to and during the development of the proposed Regulation. In March 2008, DECC wrote to a range of interested parties advising them of the review and inviting their preliminary views on anything in the current Regulation that might require amendment to improve its efficiency or



effectiveness. Roundtable discussions have also been held with several stakeholders. Feedback to date, however, has not identified a need for major changes to the Regulation.

### **1.3 Making a submission**

The RIS and the draft Pesticides Regulation are now available for public comment for a period of six weeks. DECC welcomes written submissions on them and these will be considered before finalising the Pesticides Regulation 2009.

Please send any comments on the RIS and draft Pesticides Regulation 2009 by post to:

Manager, Chemicals Policy  
Department of Environment and Climate Change NSW  
PO Box A290  
Sydney South NSW 1232

or email to [pesticides.regulation@environment.nsw.gov.au](mailto:pesticides.regulation@environment.nsw.gov.au)

The closing date for submissions is **Friday 17 April 2009**.

This RIS is also available on the DECC website at [www.environment.nsw.gov.au/pesticides/pestregis.htm](http://www.environment.nsw.gov.au/pesticides/pestregis.htm) and from Environment Line by phoning 131 555 or (02) 9995 5555.

A notice calling for submissions from the public has been published in the *NSW Government Gazette*, major metropolitan newspapers and *The Land*.

## **2. Pesticides legislation and management**

### **2.1 Roles and responsibilities at the national and state levels**

Pesticides are controlled in Australia through an inter-governmental arrangement known as the National Registration Scheme for Agricultural and Veterinary Chemicals. Under this scheme, the Australian Pesticides and Veterinary Medicines Authority (APVMA) is the Commonwealth agency responsible for assessment and registration of pesticides in Australia and their regulation up to and including the point of sale.

The States and Territories are responsible for controlling the use of pesticides beyond the point of sale, that is, for their use, storage and disposal.

### **2.2 The NSW Pesticides Act 1999 and the regulation-making power**

The NSW *Pesticides Act 1999* regulates and controls the use of pesticides in NSW. It applies to both urban and agricultural situations. The Act aims to reduce the risks to human health, the environment, property, industry and trade associated with the use of pesticides. The Act also aims to promote collaborative and integrated policies for the use of pesticides.

Under the Act, all pesticide users in NSW must:

- only use pesticides registered or permitted by the APVMA
- obtain an APVMA permit if they wish to use a pesticide in a way not covered by the label
- read the approved label and/or APVMA permit for the pesticide product (or have the label/permit read to them) and strictly follow the directions on the label
- only keep registered pesticides in containers bearing an approved label
- prevent injury to people, damage to property and harm to non-target plants and animals through the use of a pesticide.

Section 119 of the Pesticides Act provides for regulations to be made covering any matter required or permitted by the Act to give effect to the aims of the legislation. Regulations may therefore be made with respect to:

- licences and licence applications
- certificates of competency and applications for certificates
- matters relating to applicants for certificates of competency and holders of certificates of competency
- record-keeping in relation to pesticide use, supply, distribution and disposal
- training and qualification requirements
- the approval of training courses and qualifications in relation to the use of pesticides
- fees (including their waiving, remittal, reduction or refund)
- standards for the application of pesticides
- standards for the design and construction of aerial spraying equipment and its installation or attachment to, or in, aircraft

- the recognition of licences or other authorities issued by another State/Territory that correspond to, or are similar to, licences under the NSW Pesticides Act
- the circumstances in which a recognised licence or other authority is taken to be a licence granted under the Act
- notification of pesticide use
- requirements that an application or other information provided under the Act or regulations is verified by statutory declaration.

DECC administers and enforces the Pesticides Act and is therefore responsible for enforcing the proper use of pesticides in NSW after the point of sale. This includes pesticide use in agriculture, on public lands and at domestic and commercial premises. DECC encourages pesticide users to improve their management of pesticides through education programs and by facilitating communication among the various stakeholder groups.

For more information about the *Pesticides Act 1999*, visit DECC's website at [www.environment.nsw.gov.au/pesticides/pesticidesact.htm](http://www.environment.nsw.gov.au/pesticides/pesticidesact.htm)

## 2.3 Other relevant legislation and agencies

### NSW legislation

Other NSW legislation may also be used to control some activities associated with the use of pesticides.

***Protection of the Environment Operations Act 1997*** (POEO Act) provides key mechanisms for protecting the environment and improving environmental outcomes in NSW. The POEO Act contains a range of offences and enforcement powers. It provides a regulatory regime for pollution and waste management and also applies to pesticides. For example, fish kills caused by pesticide contaminants in waterways are generally investigated under the POEO Act.

***Road and Rail Transport (Dangerous Goods) Act 1997*** allows both DECC and WorkCover NSW to regulate the transport of dangerous goods (other than explosives) by road and rail as part of a national scheme for road transport. The transport of dangerous goods involves the importing, loading, consignment, marking and placarding of goods, and driving of vehicles. Because of their flammability, combustibility or toxicity, many pesticides are classified as dangerous goods.

***Occupational Health and Safety Act 2000 and its Regulation 2001*** cover the identification of hazardous substances (including most pesticides) in the workplace and the assessment and control of risks associated with their use. They also provide for the licensing and regulation of pest management technicians and commercial users of certain pesticide fumigants.

### NSW agencies

**WorkCover NSW** administers the State's occupational health and safety laws and provides information about using pesticides safely in the workplace. To help industries implement the Occupational Health and Safety Regulation 2001, WorkCover has developed the *Safe use and storage of chemicals (including pesticides and herbicides) in agriculture: Code of practice 2006* (WorkCover NSW 2006a) and the *Safe use of pesticides including herbicides in non-agricultural workplaces: Code of practice 2006* (WorkCover NSW 2006b). These codes are a practical guide to the standard of health, safety and welfare required by the Regulation and the *Occupational Health and Safety Act 2000*. WorkCover also licenses pest management technicians and commercial users of certain pesticide fumigants.

Other NSW agencies with a role in managing pesticides include:

- **NSW Health**, which advises on and assesses health-related pesticides incidents
- **NSW Food Authority** – Under the *NSW Food Act 2003*, the NSW Food Authority routinely monitors the results of pesticide and other chemical samples submitted by food companies to ensure compliance with the Australia and New Zealand Food Standards Code.
- **NSW Department of Primary Industries** administers the *Noxious Weeds Act 1993* and the *Rural Lands Protection Act 1998*. The department provides advice on the use of farm chemicals in agricultural production, including information on integrated pest-management systems that can minimise the use of pesticides and other farm chemicals. The agency also provides training and advice and oversees the use of poisons for the control of feral pest animals, through the Livestock Health and Pest Authorities network.
- **Local government** has planning, regulatory, management and monitoring roles relevant to pesticides. Local councils and some county councils are responsible for noxious weed control within local government areas and play an important role in zoning for appropriate adjacent land uses under local environmental plans and other planning mechanisms.

## 2.4 NSW Pesticides Regulation 1995

The NSW Pesticides Regulation 1995 contains provisions covering:

**Licensing of the aerial application of pesticides** – It sets the fees for licence applications, details the particulars to accompany applications, prescribes the qualifications for the issuing of a licence and sets out particulars relating to records.

**Pesticide training** – Compulsory training provisions were introduced on 1 September 2003 for anyone who uses pesticides in their job or business. Most users are expected to achieve specific national units of competency in chemical use at Australian Qualifications Framework Level 3. Separate training requirements apply for aerial applicators of pesticides and pest management technicians (pest controllers) and fumigators licensed by WorkCover NSW.

These requirements do not apply where the pesticide is:

- ordinarily used in the home or garden, and
- widely available to the general public at retail outlets, and
- being used in small quantities, that is:
  - for outdoors use, in quantities of no more than 5 litres/5 kilograms of concentrated product or 20 litres/20 kilograms of the ready-to-use product, or
  - for indoors use, in quantities of no more than 1 litre/1 kilogram of concentrated product or 5 litres/5 kilograms of the ready-to-use product, and
- being applied by hand or using hand-held equipment only.

**Record-keeping** – Since July 2002, all people who use pesticides in their job or business are required to keep a record of their pesticide use. A small use exemption, similar to that for training, applies.

**Notification of pesticide use** – Since February 2007, it has been compulsory for the following groups to give notice of pesticide use.

- **Public authorities**, including NSW Government departments, local councils and county councils need to develop a notification plan describing how they will provide the public with notice about their pesticide use in outdoor public places, such as parks and ovals, and those near sensitive places, such as schools and nursing homes.
- **People who organise a professional pesticide treatment** by a pest management technician (urban pest controller) in the common areas of multiple occupancy residential complexes need to advise residents prior to pesticide use in these areas. These include property and strata managers and managing agents.
- **Pest management technicians** who apply pesticides in the common areas of multiple occupancy residential complexes need to give residents notice while they are using pesticides in these areas. Additionally, from 1 September 2009, urban pest controllers will also be required to notify those responsible for sensitive places when they propose to spray or inject liquid pesticides outdoors on an adjoining property.

**Prescribing penalties** (including penalty notices for offences under the Pesticides Act) and fees for regulated activities

**Administrative provisions**, notably definitions such as relevant standards for defining prohibited pesticide residuals in agricultural produce.

## 2.5 Regulation amendments and reviews

The Pesticides Regulation has been reviewed regularly since it was proclaimed with the Act in 2000. As a result, existing provisions have been updated where necessary as amendments have been made to incorporate other major changes. The most recent amendments in December 2005 and November 2008 introduced new notification requirements and other provisions to make the Regulation more effective and efficient.

The 2005 amendment:

- required additional details to be recorded by licensed aerial pesticide applicators covering the application of pesticide, bringing NSW into line with other states
- required aircraft licensees to provide a copy of any pesticide application record to the owner or occupier of the land on which the pesticide is applied, also in line with other states
- extended the definition of 'registered training provider' in Part 3 of the Regulation to training providers registered outside NSW.

The 2008 amendment:

- added new notification requirements for urban pest controllers when they propose to spray or inject liquid pesticides outdoors near the common boundary with a sensitive place
- streamlined the process by which maximum residue limits for agricultural produce set by the APVMA are recognised
- removed the requirement that an authorised officer must produce a notice when requiring records to be provided to them
- updated references to Commonwealth aviation legislation in relation to a pilot (pesticide rating) licence.

## **3. Objective of the Regulation and issues to be addressed**

### **3.1 Objective of the Regulation**

The overall objective of the Pesticides Regulation is to facilitate responsible pesticide use that avoids adverse impacts on human health, the environment, property, industry and trade by:

- ensuring information is kept about pesticide use for planning, quality control and enforcement purposes (record-keeping)
- minimising the likelihood of misuse through inappropriate application of pesticides (user training)
- allowing people to avoid exposure to pesticide use if they wish (notification).

### **3.2 Benefits of responsible pesticide use**

Pesticides play an important role in supporting agriculture and other industries. Appropriate use of pesticides can improve the yield and quality of food and fibre crops, and the health and productivity of animals. Other benefits include:

- the protection of private, public and commercial dwellings from structural damage associated with termite infestations
- maintenance of public health by preventing outbreaks of disease through the control of rodent and insect populations
- assistance in the control of environmentally harmful organisms, which in turn helps protect native habitat and maintain biodiversity
- positive social, recreational and aesthetic outcomes from the use of pesticides in recreational areas, such as sporting fields, golf courses, parks and waterways.

Pesticides provide significant benefits to society as a whole. Owens (1986) estimates that United States crop and livestock production would drop by 25–30% and prices of agricultural products increase by 50–75% should pesticides be completely withdrawn from use.

An indication of the value placed on pesticides is provided by pesticide sales, assuming that users of pesticides derive at least as much benefit as the cost of purchasing material inputs. Based on available national sales data for pesticides and agricultural chemicals, the value of annual sales of pesticides in NSW is estimated at around \$475 million. This reflects the significant demand for pesticides from NSW industry.

### **3.3 Avoiding actual or potential problems from pesticide use**

The properties that make pesticides useful also make them potential risks for human and environmental health if they are used inappropriately. The people at greatest risk are those who work with pesticides or who are regularly exposed to them.

Pesticides can have various adverse impacts on humans and the environment if they are used improperly or accidents happen. Potential adverse impacts of pesticide use include:

- illness or harm to humans who are exposed to pesticides (occupational and incidental)
- harm to non-target organisms (including native, ornamental and agricultural plants and animals) and the pollution of water and land, which can damage ecosystem function and reduce biodiversity

- increased pest resistance
- a reduction in trade as a result of agricultural produce exceeding maximum residue limits (MRLs) for pesticides or damage to non-target crops from incorrect application.

## Human exposure to pesticides: Occupational and incidental

The community can be exposed to pesticides through the workplace; through the consumption of food treated with pesticides; from pesticide applications in public places, such as parks; from residual levels of pesticides following treatments in common areas of buildings; and in the home through the use of pest sprays and baits. Acute (immediate) exposure to certain levels of pesticides may result in symptoms, such as irritation of the eyes, skin or lungs. Very high levels of exposure can be fatal.

Long-term exposure to pesticides can also have serious health impacts. Beard et al (2003) found that Australian workers who were occupationally exposed to pesticides over long periods had higher rates of asthma, diabetes and leukaemia. Brown et al (2006) also established a general association between Parkinson's disease and exposure to pesticides.

In its 2007 update of the Cancer Trends Progress Report, the US National Cancer Institute stated that:

*General studies of people with high exposures to pesticides, such as farmers, pesticide applicators, manufacturers and crop dusters, have found high rates of blood and lymphatic system cancers; cancers of the lip, stomach, lung, brain and prostate; as well as melanoma and other skin cancers.*

The most serious health impacts from pesticide exposure may only become apparent after considerable time has elapsed, making it difficult to accurately identify the cause of the adverse health impact.

Impacts on human health from pesticides can be long-lived, especially for pesticides that bioaccumulate or persist in the environment for long durations. Organochlorine pesticides (OCP) are an example of persistent pesticides. Mueller et al (2008) found that some 20 years after OCPs were banned in Australia trace amounts were still present in every sample of human breast milk tested. Little if any reduction in OCP concentrations in human milk were observed, compared with research findings 10 years earlier. This highlights the legacy that persistent pesticides can leave two decades after being banned.

Over the last 10 years, there have been 25 reported deaths in Australia due to accidental poisoning by pesticides, nine of these in NSW (ABS 2008a; ABS 2008b).

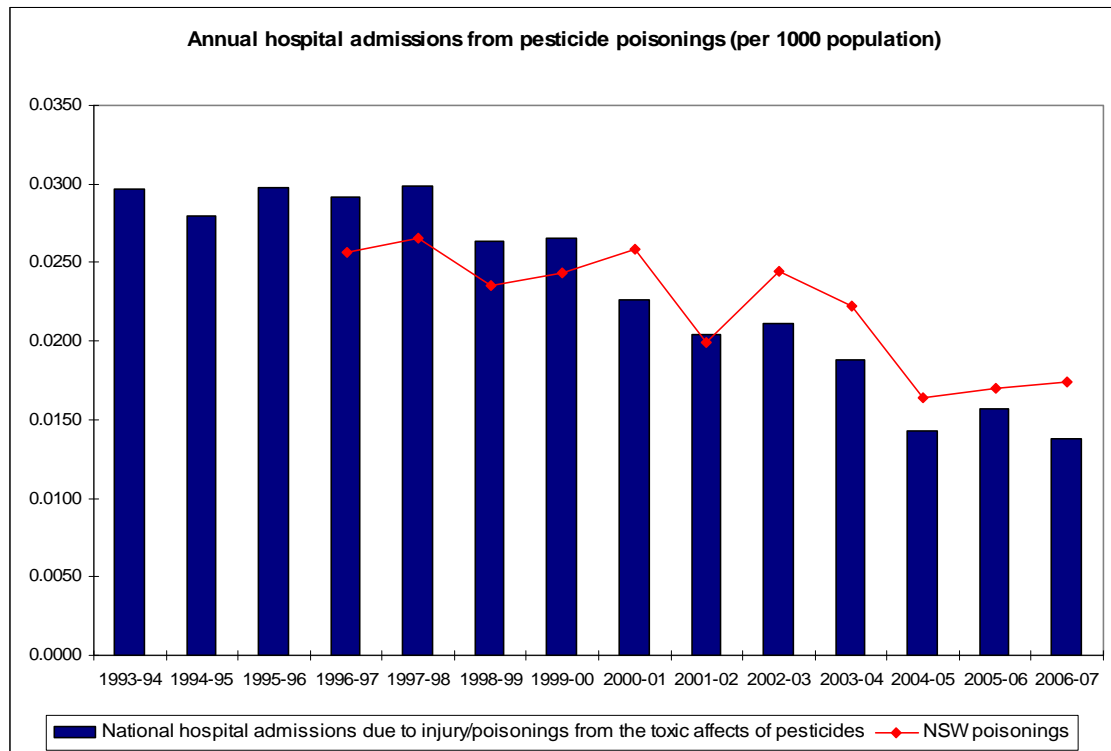
The number of Australians reporting to hospitals after being injured or poisoned from the toxic effects of pesticides (per thousand people) is shown in Figure 1, together with some NSW data.

National hospital admissions due to pesticide poisoning show a downward trend since 1997–98, as do NSW hospital admissions over the period 2000–01 to 2006–07.

The average number of NSW hospital admissions from pesticide poisoning was 145 per year between 1996–97 and 2006–07. However, this is thought to significantly underestimate the true number of pesticide poisoning incidents as not all people suffering adverse health effects visit a hospital (preferring a local doctor instead) and many pesticide users live in rural areas without ready access to hospitals.

A better indication of the extent of *actual* pesticide poisoning incidents may be provided by the annual number of calls received by Poison Information Centres. In 2007, the NSW Poisons Information Centre received 4150 calls regarding pesticide poisonings (NSW Poisons Information Centre 2007).

Figure 1



The NSW health costs from acute pesticides poisonings and accidental death over the past 10 years are estimated at \$39.8 million.<sup>1</sup> These estimates are based on *direct* pesticide poisonings and do not include the financial and social costs that can result from long-term pesticide exposure, such as the cost of treating asthma, diabetes, leukaemia and other cancers. The above costs are therefore likely to underestimate the full impact of pesticides on human health.

There appear to have been no studies on the cost to human health from pesticide exposure in Australia. An international study by Leach and Mumford (2008) estimated that pesticides resulted in annual acute human health costs equivalent to A\$3 million in the UK, A\$35 million in Germany and A\$214 million in the USA.<sup>2</sup> For a more detailed discussion of externalities from pesticide use, refer to Section 3.4 below.

## Effects of pesticides on the environment

Pesticides are by nature, intended to destroy target biota. If pesticides are used excessively, incorrectly or the chemical itself is persistent, they have the potential to have an adverse

<sup>1</sup> Morbidity was estimated from the number of NSW hospital separations (1438) due to 'Injury/poisonings from the toxic effects of pesticides' and the average length of stay (NSW Health 2008). Mortality was estimated from NSW data on 'Accidental poisoning by and exposure to pesticides' (ABS 2008b). Health costs were based on the average value of a statistical life (\$6 million in 2006 dollars) and the average value of a statistical life-year (\$252,014 in 2006 dollars) as proposed in Australian Safety and Compensation Council (2008). Figures were updated to 2007 dollars.

<sup>2</sup> These values reported by Leach and Mumford (2008) relate to the external costs of pesticides on human health (acute effects). The study reports total externalities from the use of pesticides which are broken down into pesticide contamination of drinking water, external costs to human health, environmental externalities (pollution, biodiversity losses and bee colony losses) and impacts on cultural, landscape and tourism values. Values were converted in the study to Euros and have been converted to A\$ at A\$1 = €0.5915 (12-month average: Reserve Bank of Australia 2008).



impact on the natural environment. The main impacts of pesticides are expected to be on the natural environments surrounding areas of chemical application. Adverse impacts include kills of beneficial insects (such as bees), contamination of waterways and soil, and on non-target species, such as birds that eat contaminated insects or fish that inhabit contaminated environments. These adverse impacts can occur due to spray drift or runoff from agriculture.

Some real-life examples of the adverse effects of pesticides on the environment are discussed below.

- The release of pesticides into Sydney's Manly Lagoon in 2001 was responsible for the deaths of more than 10,000 fish, numerous ducks and geese, and persistent damage to the health of the marine ecosystem. The defendant in the resulting prosecution and his employer were ordered to pay more than \$51,000 in clean-up costs.
- In 2002, most of the aquatic life along nine kilometres of Sydney's Prospect Creek was killed by a 1000-litre pesticide spill. Almost three-and-a-half tonnes of dead fish and eels were retrieved. The defendant in the resulting prosecution was fined \$20,000 for polluting waters and ordered to pay the prosecution's costs.
- Pimentel (2005) estimated the cost of pesticide use in the USA in the order of US\$10 billion per year (equivalent to A\$11.2 billion), with US\$5 billion of this specifically attributed to environmental impacts (i.e. non-human health impacts).<sup>3</sup>
- Concerted action by industry and government in recent years has addressed concerns about the use of endosulfan, an organochlorine pesticide. For example, during the 1990s, the Australian cotton industry undertook a coordinated program to reduce the impact of endosulfan on rivers and wetlands. The industry has made significant progress in reducing pesticide use and improving the techniques by which it is applied and managed on-farm (Beeton et al 2006). Prior to this action, data collected by Muschal and Warne (2003) in north-western NSW over 1995–98 found that endosulfan levels were above Australian Water Standard levels for 63–73% of samples taken from river systems.<sup>4</sup> It was also found that low concentrations of chlorpyrifos and profenofos could contribute to the deaths of aquatic organisms. Endosulfan also had a large impact on the deaths of aquatic organisms but was more likely to occur than other pesticides (identified in 70–80% of samples).
- The use of pesticides, particularly endosulfan, caused large fish kills in the late 1990s in northern cotton-growing areas of Australia (Napier et al 1998).
- Lower numbers of macroinvertebrates in the Namoi River were found to be associated with increasing concentrations of pesticides, specifically endosulfan (Leonard et al 2000).

## Increasing resistance of pests to chemicals

The ability of pest species to adapt to otherwise toxic applications of agricultural chemicals has forced most farmers to continually seek new products to remain effective in protecting crops and livestock.<sup>5</sup> As the development and approval costs for new agricultural chemicals

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<sup>3</sup> Australian dollar value based on 12-month average exchange rate as at October 2008 of A\$1 = US\$0.8874 (Reserve Bank of Australia 2008)

<sup>4</sup> Samples were taken from the Macintyre, Namoi and Gwydir catchments, where agricultural activity involved cotton, fodder and grain production.

<sup>5</sup> For an example of increasing resistance of pest species, refer to the problems caused by ryegrass resistance to herbicides (Science Alert 2007) or resistance of cattle ticks to insecticides (Baxter et al 1999).

are large<sup>6</sup> the increasing resistance of pests imposes significant costs on industry. Farmers also incur costs from changing stores of chemicals and adapting to new application requirements.

This natural process of survival by pest species can be slowed by regional coordination of pest treatments and application of the appropriate amount of pesticides (Mullen et al 2003). Adequate training of pesticide users is expected to slow the growth of pest resistance and reduce the subsequent costs to chemical producers and farmers. However, the value of this benefit remains qualitative due to the lack of available information.

## Adverse impacts of pesticides on trade and non-target crops

An example of the risk from pesticides for Australian exports can be seen from incidents of Australian canola imported to Japan over 2006–07. Australian grain exporters were placed on notice after irregular residues of the pesticide fenitrothion were detected in consignments of canola to Japan. Following a second breach, the usual process is to test 100% of incoming produce at the expense of the exporter. After a third incident in a nine-month period when levels above acceptable Japanese criteria were detected, Australia's Japanese customers were forced to consider placing enhanced inspection orders on all shipments of canola from Australia (Farm Weekly 2007).

Japan is Australia's largest importer of canola, with the gross value of production from NSW totalling \$25 million in 2007 (ABS 2008d). Although breaches of local MRLs are limited in comparison to the total sample (Australian Government 2007), the heightened scrutiny shown by some importers following a single breach highlights the risks to NSW exporters from inappropriate pesticide use.

Damage to agricultural crops can occur through inadvertent application of pesticides on non-target crops, such as via spray drift. Harvest protection insurance is available to farmers who feel their crops are at risk of damage from chemicals applied by other users (among other things). Data on the value of claims for pesticide damage to crops is not publicly available. However, an indication of lost crop value from pesticide use is given by the \$2.5 million in damages awarded to a NSW vineyard to cover harm to vines from spray drift from a neighbouring farmer's aerial application of pesticides (Cotton Industry 2000).

### 3.4 Externalities from pesticide use

Improper handling of pesticides can cause damage to the environment through their toxic effects on beneficial insects, non-target species and waterways. Pesticides can also have adverse impacts on those who manufacture, handle and use them, through both acute poisonings and chronic, long-term diseases. Many of these adverse impacts are not incorporated into the traditional market considerations of pesticide users and are referred to as externalities.

Although the externalities of pesticide use in Australia are expected to be large, no Australian studies of them have been identified. This absence of local studies makes it difficult to determine their value from a NSW perspective, and any incremental change brought about by the Regulation.

International studies, however, can shed light on the value of pesticide externalities. Leach and Mumford (2008) used estimates from a number of studies to value total pesticide

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<sup>6</sup> Kent (1992) states that the development and approval of a new agricultural chemical takes 8 to 12 years from synthesis to market, involving an investment by the company of around \$50 million.

externalities in the USA at A\$2.3 billion, in the UK at A\$589 million and in Germany at A\$342 million.<sup>7</sup> Table 1 presents a summary of values they reported.

**Table 1: Estimated pesticide externalities for UK, USA and Germany – 2006 in A\$m**

	<b>UK</b>	<b>USA</b>	<b>Germany</b>
Acute effects of pesticides on human health	3.1	214	35.8
Pesticides in drinking water sources	367.4	1,439.5	230.7
Cultural, landscape, tourism, etc.	151.5	0	0
Environmental externalities*	67.4	656.6	75.6
<b>Total</b>	<b>589.4</b>	<b>2,310.1</b>	<b>342.1</b>

\* Includes pollution incidents, fish deaths, monitoring costs, and biodiversity and bee colony losses.

Source: Values from Leach and Mumford (2008), p.142, converted to A\$.<sup>8</sup>

Note: Figures subject to rounding

As mentioned in Section 3.3, Pimentel (2005) estimated pesticide externalities in the USA were worth US\$10 billion per year, which is equivalent to A\$11.2 billion. Of the total, US\$5 billion was specifically attributed to environmental impacts (i.e. non-human health impacts).<sup>9</sup> The large figure estimated by Pimentel has been criticised by some as it is roughly equivalent to the value spent by US farmers on pesticide inputs to agriculture.

The fact that these externalities are not incorporated into decisions suggests that pesticides may be over-used from a socially optimal perspective. The presence of negative externalities from pesticide use, along with considerable risk and uncertainty, reinforces the importance of carefully managing pesticides. The provisions of the Pesticides Regulation aim to reduce the adverse impact of pesticide use on humans and the environment, effectively lowering these external costs.

<sup>7</sup> Values reported in Leach and Mumford (2008) were converted from Euros to Australian dollars at the 12-month average rate of A\$1 = €0.5915 (Reserve Bank of Australia 2008).

<sup>8</sup> Euros were converted to Australian dollars at the 12-month average rate of A\$1 = €0.5915 (Reserve Bank of Australia 2008).

<sup>9</sup> Australian-dollar value based on 12-month average exchange rate of A\$1 = US\$0.8874 (Reserve Bank of Australia 2008)

## 4. Alternative options to address the problem

There are considerable risks and uncertainties associated with managing pesticides and what their exact impacts are on human health and the environment. While major pesticide incidents occur relatively infrequently, the risk of harm from an incident may be substantial. These potential risks may be mitigated by:

- **Training pesticide users** to use pesticides correctly so that the possibility of inappropriate pesticide application is minimised: Inappropriate pesticide applications include using too much pesticide, storing pesticides incorrectly, using pesticides around vulnerable people like small children or being wrongly dressed for the job.
- **Keeping records** of pesticide applications: Keeping records helps to track the effectiveness of the pesticides used, provides vital information if incidents occur and, where an incident does occur, assists in ascertaining whether the pesticides were used responsibly.
- **Notification of pesticide use** so that people can make informed decisions about their exposure to pesticides.

It is essential that the regulatory approach to pesticide use in NSW promotes these measures as they will help protect workers who use pesticides regularly, their families, the community, trade, property and the environment.

### 4.1 Options considered

#### *The base case*

This option would allow the Pesticides Regulation to lapse on 1 September 2009. There would therefore be no legislated requirement for those using pesticides in their job or business to undertake training or keep records relating to pesticide applications. Similarly, the provisions relating to the notification of pesticide use would no longer apply.

#### *The proposed Regulation*

This option remakes the current Pesticides Regulation, preserving its major provisions and recent amendments, as well as incorporating a number of updates to make it more effective and efficient.

#### *Self-regulation*

This option consists of a non-regulatory approach where DECC works with industry associations and bodies (representing pesticide users) to encourage their members to undertake training in the correct use of pesticides, keep records of pesticide applications, and give notice of pesticide use in certain situations. Compliance would not be required by law, but guidance documents would be produced covering similar content to the proposed Regulation. Industry bodies and associations could choose to adopt these guidance documents, possibly linked to financial incentives for their members.

### 4.2 Uncertainties

Record-keeping, training, notification and other provisions of the proposed Regulation can reduce the risk of pesticide exposure to humans and the environment, trade and industry, but uncertainties remain in assessing their precise contribution.

### *Data availability*

It is difficult to accurately determine the level of pesticides being used in NSW and any changes in patterns of use. It is therefore difficult to quantify the extent to which the proposed Regulation will result in quantifiable reductions in harmful pesticide use and environmental exposure or improved human health. The human health risks from exposure to pesticides are well established (see Brown et al 2006; Colborn 2006; Beard et al 2003; Johnstone et al 2007; Fragar et al 2005) and society benefits from the correct use of these dangerous substances. However, the lack of quantifiable data makes valuing these benefits difficult. Even though it may be feasible for researchers to estimate total *externality* costs of pesticide use in NSW, it would still be unclear exactly how much of this externality would be reduced by the training, notification and record-keeping requirements of the proposed Regulation.

### *Lag times*

The literature on the impact of pesticides on human health identifies a considerable lag between pesticide exposure and the appearance of chronic impacts on human health, such as an increased incidence of asthma attacks, diabetes, leukaemia and lower neuropsychological functioning (Beard et al 2003). These longer-term impacts are very different from the immediate (acute) health impacts from pesticide exposure, which include irritation to skin and eyes, coughing, nausea, vomiting, etc. Often the most serious health impacts from pesticide exposure only become apparent after a considerable time has elapsed, making it difficult to accurately identify the cause of the adverse health impact.

### *Other factors*

Other factors can also affect the risk potential of pesticide use, for example:

- The extent to which the Pesticides Regulation reduces occupational exposure to pesticides also depends on the degree of occupational health and safety training and the adoption of correct procedures by employees working with pesticides, the frequency of handling these chemicals, weather conditions that influence and drive spray drift and the quality of equipment used to apply pesticides.
- The extent to which the Regulation can achieve the benefits of reduced incidental exposure to pesticides will depend on the level of compliance of pesticide users to the NSW Pesticides Act and Regulation and whether the community actually takes measures to avoid exposure to known pesticide use, such as in the common areas of buildings.
- The impact of pesticides on the natural environment can be affected by the extent to which pesticide users are trained, the existence and enforcement of pollution and waste disposal regulations, the level of agricultural production and compliance with the provisions of the Pesticides Act.

## 5. The proposed Regulation

It is proposed to remake the Pesticides Regulation to preserve its major provisions and recent amendments. A number of additional updates and streamlining measures will also be incorporated as outlined below.

### 5.1 User training

The Regulation requires all individuals who use pesticides in their job or business to be trained. If they are not trained, they can be fined \$400. Currently clause 7C provides a defence to proceedings brought against a person for not being trained, namely that the pesticide:

- was being applied by hand or a hand-held applicator, and
- was being used in a quantity not exceeding 20 litres or kilograms of 'ready-to-use' product or 5 litres or kilograms of concentrated product if used *outdoors*, or not exceeding 5 litres or kilograms of ready-to-use product or 1 litre or kilogram of concentrated product if used *indoors*, and
- is ordinarily used for domestic purposes, and
- is widely available to the general public.

Feedback to DECC indicated confusion in the community about this provision as in practice it operates as an exemption to the training requirement rather than a defence of why a pesticide user has not been trained. It is proposed to change this provision from being a defence to an exemption from the mandatory training requirement. This would align it with clause 11B(2) which relates to the requirement to keep records.

It is proposed to repeal the transitional provisions of subclauses 8A(1) and 8A(2)(a) as they expired on 1 September 2008. However the substance of existing subclause 8A(2)(b) will be retained so that DECC continues to have the ability to recognise alternative qualifications. This matter is machinery in nature and further economic analysis is not required under the *Subordinate Legislation Act 1989*.

It is also proposed to update the notice of units of competency approved under clause 8 of the current Regulation to reflect changes to relevant units in the new national training package and clarify the circumstances in which a particular level of competency should be achieved. For more details, go to [www.environment.nsw.gov.au/pesticides/trainingdraftnotice.htm](http://www.environment.nsw.gov.au/pesticides/trainingdraftnotice.htm). This is also machinery in nature and further economic analysis is not required.

### 5.2 Record-keeping

The Regulation requires all people who use pesticides for commercial or occupational purposes to keep a record of their pesticide use.

It is proposed to amend existing subclauses 11B(1) and 11C(2) so that they are easier to understand. The situations in which records must be kept and the information to be recorded would remain the same. This matter is machinery in nature and will have no discernible impact on the costs and benefits of the Regulation.

In a similar vein, the circumstances in which records are not required to be kept, as currently set out in clause 11A and subclauses 11B(2), 11B(3), 11B(5) and 11C(4), will be consolidated into a format which is more user-friendly and easily read.

It is also proposed to increase the penalties under existing clauses 11B, 11C and 11F to bring them into line with similar offences under the *Protection of the Environment Operations Act*

1997. This would increase the current penalties to \$750 for individuals and \$1500 for corporations, up from the current \$200 and \$400, respectively, in clause 11F and \$400 and \$800 in clauses 11B and 11C.

### **5.3 Notification of pesticide use**

No changes are proposed to the current provisions requiring certain groups to notify others of their pesticide use.

The notification requirements affecting public authorities and treatments to common areas of multiple occupancy complexes commenced on 1 February 2007 and minor amendments were made to them in November 2008 to clarify areas of uncertainty and improve their workings.

The November 2008 amendments also introduced the requirement that from September 2009 licensed urban pest controllers notify those responsible for 'sensitive places' of any plans to spray or inject liquid pesticides outdoors within 20 metres of the boundary of an adjoining property. Except in emergencies, notice of planned pesticide application is required at least five working days beforehand to the principal, director, manager or other person with the care, control or management of a sensitive place, such as a school, nursing home, childcare centre and the like.

### **5.4 Other provisions**

The fee currently prescribed in subclause 11(2) for an application for a certificate to authorise the use or possession of a restricted pesticide is to be repealed.

In relation to aerial pesticide applicator licensing, all references to the NSW aerial applicators examination are to be removed as this examination is no longer offered.

## 6. Cost-benefit analysis

This section summarises the costs and benefits for each of the options considered. Appendix I presents a more detailed discussion.

### 6.1 The base case

Under the base case, the Regulation would lapse on 1 September 2009 and not be replaced. This option serves as a starting point for analysing other options.

#### Costs and benefits to industry

Under the base case, costs to industry from pesticide user training are estimated at \$9.7 million over five years (expressed at present value).<sup>10</sup> The base case would mean the majority of pesticide users would be inadequately trained, which is likely to lead to an increase in work-related injuries, crop losses and Australian agricultural exports exceeding pesticide residue limits. Industry record-keeping costs under the base case are estimated at \$16.8 million over five years.

In the absence of the Regulation, cost savings from efficient pesticide use are expected to accrue only to those pesticide users who undertake voluntary training and/or keep pest treatment records (probably between one-third and a half of all pesticide users) and are estimated at \$8.3 million over five years.

#### Costs and benefits to government

In the absence of the Regulation, DECC would continue to incur some administration and compliance costs associated with the *Pesticides Act 1999*. These are estimated at \$4.3 million over five years. Under the base case, it is assumed that 40% of state and local government pesticide applications would result in residents being notified, costing \$806,000 over five years. Over the same period, record-keeping costs to local and state government are estimated at \$412,000, while user training is expected to cost \$260,000.

#### Costs and benefits to the community

In the absence of the Regulation, the reduction in public and sensitive place notification would increase the potential for public exposure to pesticides and remove any community right to know about potential risks to health from pesticide applications. In addition, fewer pesticide users would undertake training under the base case, increasing the likelihood that they would unknowingly handle and apply pesticides in ways that pose greater risks to themselves, the public and the environment. The limited number and detail of voluntary records kept would inhibit DECC's compliance activities, providing greater potential for non-compliant incidents and reducing DECC's ability to investigate possible pesticide misuse.

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<sup>10</sup> Future costs and benefits are converted to current dollars by discounting at a rate of 7%, as per NSW Treasury guidelines (see [www.treasury.nsw.gov.au/\\_\\_data/assets/pdf\\_file/0016/7414/tpp07-5.pdf](http://www.treasury.nsw.gov.au/__data/assets/pdf_file/0016/7414/tpp07-5.pdf)). From this point forward, all costs and benefits are expressed in present values unless otherwise stated.



## 6.2 The proposed Regulation

### Costs and benefits to industry

The proposed Regulation requires all pesticide users (apart from domestic users and pest controllers and fumigators licensed by WorkCover NSW) to be trained every five years at an estimated additional cost of \$26 million over that period compared with the base case. All pesticide applications will need to be accompanied by records, costing an extra \$6.9 million over five years. It is assumed that all costs of notification for pest controllers and the managers of multiple occupancy dwellings will be passed on to residents of the dwellings and hence borne by the community. Sensitive place notification is estimated to cost industry an additional \$2.8 million over five years compared with the base case.

As an indication of the cost savings from more efficient pesticide use in NSW, a 1% reduction in the use of pesticides would result in savings to NSW farmers and pest controllers of \$11.2 million over five years compared with the base case. Widespread user training and record-keeping under the proposed Regulation is expected to reduce agricultural crop losses from excessive or incorrect pesticide applications, although this figure has not been quantified. For the same reasons, the proposed Regulation is likely to reduce the potential for fresh produce to exceed maximum residue limits (MRLs) with the negative impacts on domestic agriculture and trade that can bring.

### Costs and benefits to government

DECC is expected to incur additional compliance and administration costs associated with enforcing provisions contained in the Regulation. These are estimated at \$760,000 compared with the base case. DECC, local councils and state government agencies will incur notification costs for pesticide applications in outdoor public places, costing an additional \$1.26 million over five years. Compared with the base case, additional training costs for local and state government pesticide users are estimated at \$708,000 over five years. Local and state governments will also incur additional record-keeping costs expected to be \$1.7 million over the same period.

The proposed Regulation requires pesticide treatment records for all non-domestic pesticide applications in NSW. This will provide great support for DECC's compliance activities and allow for more effective and timely responses to environmental and human health risks.

### Costs and benefits to the community

The notification costs that will be incurred by licensed pest controllers and managers of multi-occupancy dwellings are expected to be passed on to the residents of the dwellings, costing an estimated \$6.8 million over five years. Managers of 'sensitive places' (such as nursing homes, schools, childcare centres and community health centres) are expected to face costs of \$721,000 over five years from circulating information about pesticide treatments adjacent to their facility. Although the proposed Regulation will increase some penalties thus strengthening their role in deterring irresponsible pesticide use, these are costs which can easily be avoided by individuals not committing offences.

Under the proposed Regulation, notification of pest treatments will provide the community with the benefit of choosing whether to avoid possible exposure to pesticides. Compared with the base case, provisions under the proposed Regulation, such as notification and user training, are expected to result in avoided health costs of \$14.4 million over five years. The user-training requirements under the proposed Regulation directly reduce both the risk *and* the severity of potential environmental incidents. Environmental externalities from pesticide use in NSW have not been quantified, but may be large as indicated in Section 3.4, with

estimates for the UK of A\$67.4 million, A\$656.6 million in the USA and A\$75.6 million in Germany (Leach and Mumford 2008).

### 6.3 Self-regulation

As pesticide users work in a wide range of industries (NSW has more than 220 relevant industry groups and associations), the cost of developing a self-regulatory scheme is likely to be high with significant potential for inconsistent application of the provisions that will be included in the Regulation. Furthermore, compliance with self-regulation is likely to be low without incentives or the threat of regulation (OECD 1999) and many industry groups do not have full coverage of all pesticide users in any one industry.

Compliance in a self-regulated industry would be a financial disincentive for pesticide users as implementing many of the provisions imposes costs on industry while the resulting benefits generally accrue to the environment and the wider community. The highly uncertain level of compliance with self-regulation affects estimation of both the costs incurred by pesticide users and the benefits to the community from responsible pesticide use. This uncertainty precludes a meaningful estimation of the costs and benefits: assuming a compliance rate would be a purely arbitrary exercise.

### 6.4 Assessment of alternative options

**Table 2: Incremental costs and benefits of alternative options  
(expressed as present values over five years in A\$m)**

	Base case	Proposed Regulation*	Self-regulation
<b>Benefits</b>			
Industry	8.3	11.2	n/a
Government	–	–	n/a
Community	–	14.4	n/a
<b>Total benefits</b>	<b>8.3</b>	<b>25.6</b>	<b>n/a</b>
<b>Costs</b>			
Industry	26.5	35.7	n/a
Government	5.8	4.4	n/a
Community	–	7.5	n/a
<b>Total costs</b>	<b>32.3</b>	<b>47.6</b>	<b>n/a</b>
<b>NET BENEFIT (COST)</b>	<b>(24)</b>	<b>(22)</b>	<b>n/a</b>

\* Values are the *additional* costs and benefits of the proposed Regulation compared with the base case.

Although some benefits have not been quantified, the base case represents a net cost to society of \$24 million over five years. The base case provides limited potential for industry to achieve cost savings from efficient pesticide use. The benefits from avoided environmental damage are also likely to be lower, although these remain unquantified. There are also limited benefits to the community from greatly reduced notification under this option. For the base case to have a zero net cost to society, the sum of benefits to the community from avoided environmental damage would need to be at least \$5.8 million per annum or \$24 million over five years.

Self-regulation remains unquantified due to the arbitrary nature of compliance with any provisions set out. Self-regulation is unlikely to ensure that an adequate proportion of pesticide users will adopt good practice pesticides management or deliver effective protection from the risks of pesticide misuse. The importance of ensuring that pesticides are handled, applied and disposed of in a responsible manner with the associated benefits to the community, suggests that compliance with self-regulation would need to be widely observed. This is not considered a likely outcome under the self-regulatory option.

The proposed Regulation would have an additional net cost to society of \$22 million over five years, compared with the base case. As with the base case, this net cost excludes three unquantified benefits: reduced risks to trade; community benefits from notification; and avoided environmental damage. Under the base case, benefits from reduced environmental damage and community benefits from notification would be substantially less. For the proposed Regulation to have a positive net benefit to society, the sum of unquantified benefits would need to be at least \$5.4 million per annum.

Despite the absence of Australian research valuing environmental damage from pesticide use, international studies provide an indication of these values. Leach and Mumford (2008) valued non-market *environmental* costs from pesticide use in Germany at €44.7 million per year (equivalent to A\$75.6 million).<sup>11</sup> The proposed Regulation is expected to reduce the damage of pesticide use to natural environments through provisions such as adequate training of pesticide users. Since the break-even value for the proposed Regulation is \$5.4 million per annum and international studies have revealed values of environmental damage well in excess of this, it is reasonable to expect that were these values quantified, the provisions in the proposed Regulation would provide a positive net benefit to society.

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<sup>11</sup> Exchange rate used was €1 = A\$0.5915 (Reserve Bank of Australia 2008).

## 7. Conclusion

As outlined in Section 6, there are likely to be significant benefits to the community, industry and government from provisions such as pesticide user training, record-keeping and notification. However, it has been difficult to quantify and value some of these benefits. For instance, there have been no Australian studies to value the damage from pesticides on the natural environment. Similarly, quantitative data is lacking on the extent to which responsible pesticide management would reduce these costs. The absence of quantifiable benefits results in both the base case and the proposed Regulation presenting a net social cost to the community.

However, compared with the base case, the proposed Regulation will ensure that significantly more users will manage pesticides appropriately through adequate user training, notification and record-keeping. Therefore, the proposed Regulation is likely to provide substantially greater benefits to the community than the base case.

As the proposed Regulation secures more benefits for the community and, in the absence of quantifiable benefits, is likely to provide a net benefit to society, it is the preferred option for replacing the current Regulation when it is repealed on 1 September 2009.

## Appendix I: Detailed costs and benefits of options

The costs and benefits to industry, government and the wider community for each option are reviewed in the following sections.

### The base case

The base case option provides the greatest risk of incidents occurring from pesticide use as it would result in significantly reduced adoption of the measures in the current Regulation that support the aims of the Pesticides Act. The outcomes of the base case would probably result in greater risks to human health, more adverse environmental impacts and increased resistance of pests on agricultural crops.

#### *User training*

Under the base case, many of those who use pesticides in their job or business would not be required to undergo training in the responsible use of pesticides. Exceptions would be aerial applicators and licensed pest controllers and fumigators who are required to undertake mandatory training by occupational health and safety legislation. Nonetheless, it is expected that training of some pesticide users would continue regardless of the legislated need. Data available from times before the user-training provisions were introduced in 2003 indicate that 6000 people on average were undertaking voluntary pesticide training each year. It is assumed that in the absence of a Regulation, these users would continue to undergo training. This suggests that under the base case one-third of the estimated 18,000 pesticide users needing to be trained each year would continue to be trained in the correct preparation and application of pesticides.<sup>12</sup>

#### *Record-keeping*

Under the base case, there would be no legislated requirement for pesticide users to keep records relating to pesticide applications. However, it is estimated that around 50% of pesticide users (other than pest controllers) currently keep records for other purposes and would continue to do so in the absence of a Regulation.<sup>13</sup> It is also likely that in many cases, the records kept would be less detailed than those required under the existing Regulation. It is also assumed they would take only two minutes to complete compared with an average of five minutes under the proposed Regulation.

#### *Notification*

Under the base case, there would be no legislated requirement for administrators of multiple occupancy dwellings to notify their residents of pest treatments on common property or for pesticide operators to notify sensitive places of adjacent pest treatments. It is assumed pest controllers and managers of multiple occupancy buildings would cease to notify residents of treatments, thereby incurring no costs. However, community expectations are likely to result in around 40% of government bodies (both state and local) continuing to notify the public of

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<sup>12</sup> It assumed that all of these people would undertake only a half-day refresher under the base case.

<sup>13</sup> Discussion with industry and government sources suggests that the proportion of records kept irrespective of requirements under the Regulation is approximately 50%. Pesticide records are required by large supermarkets such as Coles and Woolworths; for various occupational health and safety requirements; under licence conditions for commercial pest controllers and aerial applicators; and for participation in trade with some countries (e.g. Japan).

their pesticide use in public places with the same cost structures as under the existing Regulation.<sup>14</sup>

The following sections look at the costs and benefits of the base case as they apply to industry, government agencies and the wider community.

## Costs to industry

### *User training*

Under the base case, it is assumed that the number of pesticide users undertaking voluntary training is comparable with those doing so before the training provisions were introduced in 2003. With only one-third of pesticide users being trained, training costs are estimated at \$2.3 million per annum or \$9.7 million over five years (expressed at present value).<sup>15</sup>

The base case would mean inadequate training for the majority of pesticide users as well as more adverse impacts, including work-related injuries, accidental poisonings, damage to ecosystems from excessive pesticide application, and potential impacts on agricultural pest resistance.

### *Record-keeping*

With 50% of agricultural pesticide users keeping (less detailed) records under the base case, record-keeping costs are estimated at \$4.1 million per annum or \$16.8 million over five years.

The other half of pesticide users who no longer keep records will have a limited ability to monitor and improve the efficiency of their pesticide use. This lessens the likelihood that they will realise cost savings from better pesticide use. This reduced ability to cut costs has not been estimated due to the uncertain and widely varying nature of record-keeping and pesticide use.

### *Notification*

In the absence of a Regulation, there would be no legislated requirement that licensed pest controllers and administrators of multiple occupancy dwellings notify residents of pest treatments on common property or for pest controllers to notify sensitive places of nearby treatments. They are assumed to cease notifying residents of treatments, thereby incurring no costs.

## Benefits to industry

### *Compliance activities*

The base case would present an opportunity for cost savings by irresponsible operators, as some misuse of pesticides would no longer attract penalties. Offences under the current Regulation, such as aerial applicators not providing farmers with records of pesticide treatments, using unqualified staff to apply pesticides, and reporting false or misleading

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<sup>14</sup> This is consistent with the number of councils notifying in some form prior to the introduction of the notification provisions of the Regulation in 2005.

<sup>15</sup> Future costs and benefits are converted to current dollars by discounting at a rate of 7%, as per NSW Treasury guidelines (see [www.treasury.nsw.gov.au/\\_\\_data/assets/pdf\\_file/0016/7414/tpp07-5.pdf](http://www.treasury.nsw.gov.au/__data/assets/pdf_file/0016/7414/tpp07-5.pdf)). From this point forward, all costs and benefits are expressed in present values unless otherwise stated.

information in voluntary pest treatment records, would not attract a penalty. The reduced occurrence (and likely limited accuracy) of records suggests that it would be difficult for DECC to prove alleged misuse of pesticides. These avoided costs to industry have not been estimated due to the uncertain extent of breaches that may arise in the absence of a compliance regime.

### *Improving efficiency of pesticide use*

Training of pesticide users and access to records of pesticide use can assist farmers and commercial pest controllers to minimise waste arising from excessive or inaccurate application and over-ordering. Without the Regulation, one-third of all pesticide users are assumed to undertake voluntary training with records kept for up to 50% of all pest treatments. Under the base case, it is expected that any efficiency gains in pesticide use resulting from access to records and training would be limited to between a third and a half of all pesticide users. As an indication of these cost savings, a 1% reduction in the use of pesticides could result in an annual cost saving of between \$1.2 and \$1.7 million to NSW farmers and \$0.5 and \$0.7 million to NSW pest controllers. This amounts to an average of \$8.3 million over five years.

## Costs to government

### *Aerial applicators*

In the absence of a Regulation, DECC would be unable to collect fees for aerial applicator licences and the information required in applications would not be supplied. Only seven new licences were issued (for both planes and pilots) in 2007–08. These licences do not expire and there is no need for annual renewal. DECC incurs few costs from administering aerial applicator licences and hence its ability to recover costs would not be significantly affected by the absence of aerial licence fees under the base case.

DECC would incur marginally higher administrative costs from collating inconsistent applications for aerial licences. However, these costs are not considered significant due to the small number of new licences received each year.

### *Compliance activities*

In the absence of a Regulation, DECC would continue to incur some administration and compliance costs in relation to the *Pesticides Act 1999*. DECC costs attributed to provisions under the Act are estimated at \$1.1 million per annum or \$4.3 million over five years.

However, under the base case, DECC compliance activities would be inhibited by the limited nature of voluntary records kept, covering just half of all pesticide treatments and likely to be considerably less detailed.

DECC receives an average of 250 complaints relating to pesticides each year, although it is believed that this underestimates the actual number of incidents, many of which are resolved informally among neighbouring farmers and their employees.

The absence of records would provide greater potential for incidents of non-compliance with the Pesticides Act and DECC would have a reduced ability to investigate possible pesticide misuse. This would hinder DECC's ability to protect human and environmental health from irresponsible pesticide use and the benefits of DECC compliance activities would be reduced.

### *Notification*

Under the base case, there would be no legislated requirement for public authorities to notify of pesticide treatments in public places. However, a survey conducted in 2001 prior to the introduction of the notification requirements found that 40% of councils were already telling residents about pest treatments on public lands in some form. Under the base case, it is assumed that 40% of state and local government applications would continue to result in residents being notified, due to public pressure and expectations. This would result in costs to local and state governments of \$197,000 per annum or \$806,000 over five years.

### *Record-keeping and training*

Under the base case, both local and state government pesticide users are expected to keep less detailed records for approximately 50% of all pesticide applications. Producing these records would impose annual costs on government of \$100,000 or \$412,000 over five years.<sup>16</sup>

The number of pesticide users employed by local and state governments makes up approximately 2.5% of all users. Under the base case, training costs to local and state governments are expected to be \$260,000 over five years.

## Costs to the community

### *Notification*

The reduction in notifications under the base case would result in greater potential for public exposure to pesticides and remove any community right to know about potential health risks from pesticide applications. A DECC survey of over 1000 people in 2006 found that almost 60% considered that being notified of pesticide treatments next door to where they live was 'very important' (DECC 2006). This suggests that the NSW public are concerned about notification of pesticide treatments and would suffer a loss in welfare should these provisions cease under the base case.

### *Human exposure to pesticides*

In the absence of a Regulation, fewer pesticide users would undertake training each year. This lack of adequate training is expected to increase both the number and severity of human exposure to pesticides. With a greatly reduced number of trained pesticide users, it could reasonably be assumed that the current downward trend in pesticide poisonings (shown in Figure 1) might increase along with related health costs.

Furthermore, the penalty framework previously used to enforce the Regulation would no longer exist under the base case. There would also be less incentive for affected industries to maintain the high standards of pesticide use that have been established by the current Regulation. This would be compounded by the absence of a significant proportion of records, further weakening the compliance regime. In cases where there is a financial benefit for entities to be non-compliant with no pecuniary measures to prevent such behaviour, the incidence of non-compliance would increase greatly.<sup>17</sup> Without sufficient legal or financial incentives to maintain a high standard of care in pesticide use, the NSW community may face

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<sup>16</sup> Local councils are expected to make approximately 119,000 pesticide treatments each year and state government 37,000 treatments. Under the base case, it is assumed that only 50% of treatments would result in a (less detailed) record, taking just two minutes to complete.

<sup>17</sup> The corollary indicated by the literature on penalty levels is that in the absence of recidivism and with a reasonable risk of apprehension a higher penalty level will result in higher compliance.



higher exposure to pesticides through pesticide residues in food, a lack of notification of commercial applications and poorly trained pesticide applicators. The significant potential for pesticides to inflict damage on human and environmental health highlights the need for a robust compliance regime to support the responsible handling and application of pesticides.

The absence of user-training requirements and a penalty framework under the base case would increase the likelihood that pesticide users will unknowingly handle and apply pesticides in ways that pose greater risks to human and environmental health.

## Benefits to the community

### *Notification*

In the absence of a Regulation, it is assumed that public pressure would result in around 40% of government bodies (both state and local) continuing to notify residents of pest treatments in public places.<sup>18</sup> Therefore, approximately 40% of the current benefits from public place notification would be realised under the base case.

### *Environmental and human health*

It is assumed that one-third of pesticide users otherwise required by the Regulation would still undertake voluntary training in the use of pesticides under the base case.<sup>19</sup> This would result in a moderately positive impact on human and environmental health from the one-third of pesticide users trained, but bring increased risks to humans and the environment from the inappropriate application of pesticides by the other two-thirds of users. Although large-scale pesticide incidents have occurred infrequently over recent years, the impact from even a single incident can have significant and irreversible effects on ecosystem functioning.<sup>20</sup>

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<sup>18</sup> This is consistent with the number of councils notifying in some form prior to the introduction of the Regulation in 2005.

<sup>19</sup> Data collected in 2001 before the user-training provisions were introduced indicated that 6000 people on average were undertaking voluntary pesticide training each year. It is assumed that in the absence of the Regulation, these users would continue to undergo voluntary training. This suggests that one-third of the estimated 18,000 pesticide users needing to be trained each year would continue to be trained under the base case.

<sup>20</sup> For an example of the impact from a single pesticide spill, refer to the contamination of Manly Lagoon in 2001 (details available at [www.agcsa.com.au/static/atm\\_articles/html/5\\_6d.html](http://www.agcsa.com.au/static/atm_articles/html/5_6d.html)).

## Assessment of the base case

Table 3 shows the present value of costs and benefits of the base case over five years. 'Unquantifiable' is where it was not possible to estimate reliable values for benefits.

**Table 3: Summary of costs and benefits for the base case  
(expressed at present value over five years in A\$m)**

<b>Costs</b>	
<b>Industry</b>	<b>26.5</b>
User training	9.7
Record-keeping	16.8
<b>Government</b>	<b>5.8</b>
Compliance and administration	4.3
Notification	0.8
Record-keeping	0.4
User training	0.2
<b>Total costs</b>	<b>32.3</b>
<b>Benefits</b>	
<b>Industry</b>	<b>8.3</b>
Efficient pesticide use	8.3
<b>Community</b>	<b>Unquantifiable</b>
Avoided exposure to pesticides through notification	Unquantifiable
Avoided environmental damage	Unquantifiable
<b>Total benefits</b>	<b>8.3</b>
<b>NET QUANTIFIABLE BENEFIT (COST)</b>	<b>(24)</b>

Although there are likely to be some additional benefits that have not been quantified, the base case represents a net cost to society of \$24 million over five years. The base case involves limited potential for industry to yield efficiency gains from records and training in pesticide use. There are also fewer benefits to the community in the form of avoided environmental damage and reduced notification. For the base case to have a positive net outcome, the sum of the benefits to the community from limited notification and avoided environmental damage would need to be at least \$5.8 million per annum or \$24 million over five years. Obtaining these benefits is unlikely in the absence of the Regulation.

## The proposed Regulation

### Costs to industry

#### *Aerial applications*

The proposed Regulation imposes a financial cost on aerial applicators through licence fees. However, this \$50 fee applies only to the initial licence application and is not an ongoing commitment. While aerial licence fees represent a transfer between industry and government, the administrative costs to DECC and the cost to industry from completing applications is insignificant due to the small number of applications.<sup>21</sup>

#### *User training*

As part of their licence agreement, aerial applicators are required to be accredited in the Spray Safe course (or equivalent) delivered by the Aerial Agricultural Association of Australia. This is an initial cost and not an ongoing requirement under the Regulation. The cost of attending this training prior to applying for a licence is not considered to be significant due to the small number of new applications received (only seven applications in 2007–08).

The proposed Regulation requires all pesticide users (other than domestic users and pest controllers and fumigators licensed by WorkCover NSW) to be trained every five years. The additional cost to industry compared with the base case is \$26 million over five years. This is based on estimates of the costs of travelling to attend training (\$1.2 million), lost productive time from attending training (i.e. an opportunity cost of \$14.7 million) and the cost of training (\$10.1 million). The cost per trainee amounts to approximately \$500 every five years.<sup>22</sup> In comparison with the median cost of a worker's compensation claim of \$910,<sup>23</sup> training costs are a moderate preventative cost for employers to reduce injuries and compensation claims resulting from pesticide use.

#### *Record-keeping*

Under the proposed Regulation, all applications, including agricultural and commercial pesticide treatments would need to be recorded at an estimated cost of \$3.10 per record.<sup>24</sup> Compared with the base case, the proposed Regulation would impose additional costs on pesticide users from making and keeping records of \$1.7 million per annum or \$6.9 million over five years.

#### *Notification*

Costs for pest controllers notifying residents in multiple occupancy dwellings of pest treatment come from preparing notification materials, advising building managers of the legislated requirements and confirming notification upon arrival at a job. It is assumed these

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<sup>21</sup> In 2007–08, only seven new licences were issued for both planes and pilots.

<sup>22</sup> Made up of the cost of the training course, travel costs and the opportunity cost of lost productive time.

<sup>23</sup> Value of the median compensation claim for an injury in NSW agriculture (Franklin et al 2005, Table 3-2).

<sup>24</sup> Based on estimates of the number of non-pest-control records of approximately 753,000 per year and records kept by pest controllers of approximately 3.6 million per year. The average cost per record is based on an estimated opportunity cost for time taken to make each record of five minutes.

costs would be passed on in the price of pest treatments charged, resulting in zero net costs to pest controllers. Dwelling managers would incur the costs passed on from pest controllers as well as additional costs from providing prior notification to residents of pest treatments in common areas. However, it is likely that building managers would directly bill residents for pest treatments undertaken, allowing them to pass on these costs through strata administration funds. It is therefore assumed that all notification costs (to pest controllers and building managers) are passed on to residents (discussed under costs to the community).

Sensitive place notification requirements would impose costs on industry including time and resources needed for commercial pest controllers to assess whether a sensitive place is adjacent to their planned job (\$1.2 million over five years); from notifying the sensitive place manager (\$452,000 over five years); and from the cost of cancellations when unplanned notifications are required (\$1.1 million over five years). The proposed Regulation results in additional costs to the pest control industry of \$2.8 million over five years.

## Benefits to industry

### *Improving efficiency of pesticide use*

The proposed Regulation requires that all pesticide users maintain records of pest treatments for at least three years. According to the Maryland Department of Agriculture,<sup>25</sup> some of the benefits of keeping pesticide records include:

- Records can prove invaluable as a defence against a complaint or lawsuit that could arise under common law, under environment protection legislation or in relation to occupational health and safety.
- Records can help to determine which pesticide treatments work and which do not and why.
- Records can help applicators to plan future purchases of pesticides so that only the actual amount needed will be purchased, keeping costs down and avoiding the problem of disposing of unwanted pesticides and their containers.
- Records can assist with integrated pest management programs.
- If medical treatment for a pesticide injury is needed, pesticide record-keeping can provide necessary information to medical staff.

A benefit to industry of the proposed Regulation is that agricultural landholders will have access to records for all pesticide treatments, enabling a comparison of the quantity of pesticides applied with the final quality and quantity of produce. This assists landholders to optimise expenditure on pest treatments by avoiding unnecessary purchases and applications and better determining future pest treatment needs. Training of pesticide users also ensures efficient pesticide use and reduced wastage through the correct calibration of equipment, reduced spray-drift and use of the right dosages.

As an indication of the possible cost savings from more efficient pesticide use in NSW, a 1% reduction in pesticide use could result in an annual cost saving of \$3.3 million to NSW farmers and \$1.4 million to NSW pest controllers.<sup>26</sup> This represents an additional cost saving of \$11.2 million over five years compared with the base case. Access to pesticide use records

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<sup>25</sup> Maryland Department of Agriculture website: [www.mda.state.md.us/plant/record.htm](http://www.mda.state.md.us/plant/record.htm) (June 2000)

<sup>26</sup> Based on a 1% reduction in pesticide costs, estimated sales of pesticides in NSW of \$475.4 million, of which approximately 70% is used in agriculture and 30% by pest controllers.

is also a basic requirement of applying Integrated Pest Management (IPM), which has been shown in overseas trials to improve yields while reducing chemical inputs.<sup>27</sup>

### *Maximum Residue Limits (MRLs)*

Referencing the Food Standards Code and the Australian Pesticides and Veterinary Medicines Authority MRL standard in the Regulation provides clarity for food producers and marketers about the pesticide concentrations that would be considered a prohibited residue under the Pesticides Act. Agricultural produce with prohibited residues may be subject to notices or orders under the Act and barred from sale. Agricultural producers also benefit from feedback on produce that exceeds MRLs, allowing them to change pesticide use practices and reduce future loss of sale.

### *Trade impacts*

By ensuring that users of pesticides are adequately trained, records of pesticide treatments are kept and a compliance framework is maintained, the Pesticides Regulation is expected to reduce the risks of fresh produce exceeding MRLs, thereby reducing the potential for trade and domestic impacts on the agricultural industry.

### *User training*

The requirements under the proposed Regulation for pesticide users to undergo training provide a number of benefits for employers. Appropriate user training results in reduced likelihood of employees being poisoned or suffering other adverse health impacts, reducing costs to employers from lost productivity and compensation claims. User training also removes the need to send staff to additional occupational health and safety training on pesticide use, another cost saving for employers.

## Costs to government

### *Aerial applications*

The costs to DECC from processing licences for aerial applicators are insignificant due to the low number of applications and their one-off nature.<sup>28</sup>

### *Compliance and administration*

DECC is expected to incur additional compliance and administration costs from enforcing the Regulation compared with the base case. DECC compliance activities would involve industry audits and inspections and are estimated to occupy the equivalent of 1.5 EFT DECC staff per annum. Over five years, additional DECC compliance costs compared with the base case are estimated at \$630,000. DECC would also incur costs from administering the Regulation, including responding to incidents and providing advice to industry. Administering the Regulation is estimated to take an average of eight weeks of staff time per year. Over five

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<sup>27</sup> Young et al (2001) (cited in Devine and Furlong 2007) found that reducing pesticide use can increase agricultural profitability. Young demonstrated that for 66 different crops in the UK, farms with reduced pesticide application regimes averaged a 2% higher profit margin than farms using standard, high-input schemes. An international study by Pretty (2005) found that over 60% of agricultural producers who implemented IPM were able to reduce their pesticide use while *increasing* yields.

<sup>28</sup> Only seven applications (including both plane and pilot licences) were received in 2007–08 and total DECC costs in processing these applications was unlikely to exceed \$1000.

years, the present value of additional DECC administration costs compared with the base case is estimated at \$131,000.

### *Notification*

Local councils in NSW and state government agencies (such as RailCorp, the Roads and Traffic Authority and State Forests) would incur costs from providing notification of pest treatments in public places in accordance with their pesticides use notification plan. DECC, including Parks and Wildlife and the Botanic Gardens, would incur additional costs from providing notification of \$59,000 over five years compared with the base case. Additional costs to local and state government agencies (excluding DECC) are estimated at \$1.2 million over five years.<sup>29</sup> The additional average cost per council from the proposed Regulation is estimated at \$2500 per year. The average additional cost to state government agencies is estimated at \$1800 per year. These costs are not expected to have a significant impact on state or local government budgets.

### *Training and record-keeping*

Approximately 2.5% of those who use pesticides in their job are employed by local and state government agencies (including DECC) and are required to undergo training. Additional training costs incurred by local and state government under the proposed Regulation are estimated at \$172,000 per annum or \$708,000 over five years.<sup>30</sup>

Under this option, local and state governments would also incur record-keeping costs from pesticide applications made by public sector pesticide users. The additional costs, compared with the base case, are estimated at \$402,000 per annum or \$1.7 million over five years.

## Benefits to government

### *Compliance activities*

DECC received 243 pesticide-related complaints in 2007, all of which were investigated in some capacity. Compliance activities are also supported by the presence of pesticide treatment records, which would continue under the proposed Regulation. The existence of records allows for a more effective and timely response by DECC to environmental or human health risks and provides DECC with information to facilitate investigations of possible misuse of pesticides.

Issuing Penalty Infringement Notices for minor breaches of the Regulation avoids the need for DECC to pursue more costly court prosecutions.

## Costs to the community

### *Notification*

Costs incurred by licensed pest controllers and the managers of multiple occupancy dwellings from the requirement to notify residents are expected to be passed on to the residents. These costs are estimated at \$6.8 million over five years. Averaged across all multi-occupancy

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<sup>29</sup> These notification costs are based on participation by 152 local councils in NSW and 38 government agencies (excluding DECC).

<sup>30</sup> It is estimated that 2.55% of pesticide users are employed by both local and state governments. Estimates of costs are consistent with the assumptions made for industry.

dwellings, this equates to an increase in annual costs of \$23.52 per building and is unlikely to pose a significant burden on residents.

Managers of sensitive places (such as nursing homes, schools, childcare centres and community health centres) would incur costs from circulating information of pesticide treatments adjacent to their facility and are assumed to pass these on to their clients (i.e. parents of children attending school or childcare). These costs are estimated at \$721,000 over five years. These additional costs are not expected to have a significant impact on childcare costs: they will not place a burden on school budgets or on the costs of nursing homes and community health services.<sup>31</sup>

### *Penalty Infringement Notices*

The number of Penalty Infringement Notices issued over the last six years shows an upward trend, suggesting that current levels of penalties are not acting as a sufficient deterrent to non-compliant behaviour by some pesticide users. The proposed Regulation would increase the level of some penalties in line with similar offences in other legislation to strengthen their role in deterring irresponsible use of pesticides. These proposed amendments would increase the immediate cost to those individuals committing an offence. However, these costs could easily be avoided by individuals not committing the offence. The impact of any additional costs from higher penalties is expected to be outweighed by the increased value the public derives from the improvements to human and environmental health from appropriate pesticides management.

## Benefits to the community

### *Notification*

The notification provisions of the proposed Regulation implement the principle of 'community right to know' by helping people reduce their potential exposure to pesticides, as well as implementing the precautionary principle. The extent to which these benefits are attributable to the Regulation itself depends on the degree of adherence by urban pest controllers and public authorities to the Pesticides Act, which prohibits pesticide use which causes harm to humans.

Under the proposed Regulation, notification will continue to be provided for pest treatments in common areas of residential complexes, in outdoor public spaces such as parks and next door to 'sensitive places' such as schools and childcare centres. This information provides members of the community with a choice of avoiding the possible exposure to pesticides. The community's right to know about chemical use (including potentially hazardous pesticide treatments) is recognised as a key element of industry best practice in chemicals management (United Nations/IOMC 1998). The NSW community appears to share this opinion, with 89% of recent survey respondents stating that 'more should be done' to provide information about chemicals and their impacts and almost 60% regarding notification of pesticide treatments next door to where they live as 'very important' (DECC 2006). Of all respondents, 51% said they would be willing to pay an additional amount of money to inform neighbours of pesticide treatments on their own property.

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<sup>31</sup> Unless the distribution of commercial pest treatments is highly concentrated in a limited number of small-scale sensitive places, the expected increase in the cost of services provided by sensitive places is not expected to be significant. Based on an even distribution of pesticide treatments requiring notification across a total of 7412 sensitive places, the increase in annual costs to each site would be approximately \$23.

### *Avoided human exposure to pesticides*

It is expected that the proposed Regulation will reduce the number of occupational incidents involving pesticides, as well as health costs and the value of lost productive time. Although there are other factors that also determine the incidence of pesticide exposure in the workplace, its occurrence should be significantly reduced by the knowledge from training in the risks associated with handling, applying and storing these chemicals.

Between 1997 and 2006, health costs from pesticide poisonings in NSW have been estimated at \$39.8 million (2007 dollars).<sup>32</sup> It is expected that provisions such as user training and notification will reduce the incidence of poisonings in NSW and hence the costs of health care and lost productive time. Since 1998, there has been a downward trend in the number of hospital admissions due to the poisoning and toxic effects of pesticides (see Figure 1). It is assumed this trend will continue under the proposed Regulation. Over the last 10 years, nine people died in NSW from accidental poisoning through pesticide exposure: almost one person per year on average (ABS 2008b). By requiring training of pesticides users, the proposed Regulation will help prevent unnecessary deaths from pesticide poisoning. It is assumed that the provisions in the Regulation will result in one less death every two years compared with the base case (under which significantly less training would occur). Based on these assumptions, the proposed Regulation would result in avoided health costs compared with the base case of \$14.4 million over five years.<sup>33</sup>

It is also expected that the proposed Regulation would minimise human health risks posed by food produce containing pesticide residues higher than acceptable MRLs. User-training requirements and the presence of a compliance framework under the proposed Regulation reduce the likelihood that growers of food produce will apply pesticides in ways that pose a risk to human health. There are also benefits to the NSW public from the assurance that food items purchased from stores meet safe limits for pesticide residues and that these limits are being enforced. For instance, a US study (Ott 1990) found that consumers were willing to pay 5–10% more to ensure a product purchased was free of pesticide residues. This willingness to pay an additional premium on fresh produce, free from pesticide residues, is supported by other studies in Canada (Cranfield and Magnusson 2003) and Italy (Bocchetti and Nardella 2000).

### *Avoided environmental damage*

The user-training requirements under the proposed Regulation ensure that all pesticide users can identify potential environmental hazards associated with the use and disposal of these chemicals. Despite other NSW legislation that prohibits pollution from chemicals, the user-training requirement under the proposed Pesticides Regulation can directly reduce both the risk *and* the severity of potential environmental incidents. The environmental externalities from pesticide exposure to natural environments may be large, as indicated by overseas estimates (listed in Table 1). Although there have been no valuation studies of pesticide externalities in Australia, an indication of the potential impacts is highlighted by clean-up costs associated with individual incidents such as at Manly Lagoon in 2001 (which totalled more than \$51,000).

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<sup>32</sup> Refer to discussion of values in footnote 1.

<sup>33</sup> This is based on estimates of avoided health costs (both morbidity and mortality) compared to the base case. Under the proposed Regulation, the current downward trend in acute poisonings (morbidity) is expected to continue, and it is assumed that one death from pesticide poisoning (mortality) is avoided every two years.



## Assessment of the proposed Regulation

Table 4 shows the present value of costs and benefits of the proposed Regulation over five years. 'Unquantifiable' is where it was not possible to estimate reliable values for benefits.

**Table 4: Summary of incremental costs and benefits for the proposed Regulation (expressed at present value over five years in A\$m)**

<b>Costs</b>	
<b>Industry</b>	<b>35.7</b>
User training	26.0
Record-keeping	6.9
Notification	2.8
<b>Government</b>	<b>4.4</b>
Compliance and administration	0.76
Notification	1.2
Training	0.7
Record-keeping	1.7
<b>Community</b>	<b>7.5</b>
Notification	7.5
<b>Total costs</b>	<b>47.6</b>
<b>Benefits</b>	
<b>Industry</b>	<b>11.2</b>
Efficient pesticide use	11.2
Reduced risk to trade of produce	Unquantifiable
<b>Community</b>	<b>14.4</b>
Notification	Unquantifiable
Avoided health costs	14.4
Avoided environmental damage	Unquantifiable
<b>Total benefits</b>	<b>25.6</b>
<b>NET BENEFIT (COST)</b>	<b>(22.0)</b>

Based on the above estimates, the proposed Regulation would have an additional net cost to society of \$22 million over five years. However, this does not include three benefits unable to be quantified: avoided environmental damage, community benefits of notification and reduced rate of pest resistance. In order for the proposed Regulation to have a positive net benefit to society, the sum of these benefits needs to be at least \$5.4 million per year or \$22 million over five years. In the absence of Australian research valuing environmental damage from pesticide use, international studies provide an indication of these values. Leach and Mumford (2008) valued annual non-market environmental costs from pesticide use in Germany at €44.7 million (A\$75.6 million). The proposed Regulation is expected to reduce the damage costs of pesticide use on natural environments from provisions such as adequate training of pesticide users. Given that the break-even value for the proposed Regulation is \$5.4 million per year and international studies have revealed values of environmental damage well in excess of this, it is reasonable to expect that were these values quantified, the provisions in the proposed Regulation would provide a positive net benefit to society.

## Appendix II: Selected economic assumptions

### General assumptions

<b>On-costs</b>	
Pest management technician	75%
Pest management trainee	75%
Pest management administrator	50%
DECC officer (and all others)	30%
<b>Salary costs</b>	
Combined average salary for sensitive place worker based on:	\$54,892
• administrative healthcare salary	\$48,917
• administrative education salary	\$67,842
• early childcare salary	\$47,917
Pest control technician salary (average)	\$44,640
Pest control trainee salary (average)	\$30,634
Pest control administration salary (average)	\$35,741
Strata managers salary (average)	\$62,760
Local council salary (average)	\$69,000
DECC staff salaries:	
• EPO 5 officer (average)	\$61,082
• EPO 7 officer (average)	\$70,017
• EPO 8 officer (average)	\$75,134

### Notification

#### *The base case*

Public pressure for notification prior to the introduction of the public notification provisions in 2005 indicated that 40% of local councils were already notifying in some form. The base case assumes that 40% of local and state government agencies would continue to notify facing the same cost structure as under the current Regulation.

It was assumed that pest controllers and managers of multiple occupancy dwellings would cease notifying residents of treatments in common areas to avoid costs.

It was assumed that pest controllers would also cease notifying sensitive place managers of pest treatments on adjacent properties.

#### *The proposed Regulation*

Complete (100%) compliance is assumed for calculating costs under the proposed regulation. This means that:

- all local councils and government agencies notify the public of pest treatments occurring in public areas
- all multi-occupancy dwelling managers notify residents of pest treatments in common areas of buildings
- all pest controllers notify sensitive place managers of pest treatments in adjacent properties
- all sensitive place managers notify their clients (e.g. parents of children in childcare, patients in hospitals, etc.) of pest treatments.

Costs incurred by pest controllers in notifying multi-occupancy dwellings are assumed to be passed on to building managers in the cost of each pest treatment. Building managers are also assumed to pass these costs on to residents (i.e. costs originally incurred by the pest industry are eventually borne by the community).

## User training

### *The base case*

An average of 6000 people would undertake voluntary pesticide training each year under the base case. This is consistent with the number of pesticide users who undertook training before the user-training provisions were introduced in 2003.

All people doing voluntary training under the base case are assumed to undertake a half-day refresher (as opposed to a two- or one-day course).

The costs to training providers of running pesticide training courses are assumed to be covered by fees charged (i.e. it is assumed there is no profit and hence no flow-on effects to the wider economy).

### *The proposed Regulation*

It is assumed that:

- the total number of people requiring pesticide training increases by 2% pa
- new entrants to the industry (i.e. the 2% mentioned above) along with 5% of existing pesticide users, would need initial training (i.e. a full two-day course)
- 45% of existing users complete a one-day refresher
- 50% of existing users complete a half-day refresher
- training is spread evenly across five years.

Costs to course attendees are the sum of:

- opportunity cost of time: \$299 per day (based on average weekly earnings plus 30% on-costs)
- travel costs of \$42.49 (assumed travel time to training course is one hour in each direction at 40 km/hr)
- course fees:
  - average fee for full two-day course – \$316
  - average fee for a half- or one-day refresher – \$213.

It is also assumed that travel costs are reduced by half for both two- and one-day courses as attendees conduct other business en route to the course.

## Record-keeping

### *General*

Total costs from keeping records are calculated by multiplying:

$$\begin{aligned} & (\text{number of relevant businesses}) \times (\text{number of pesticide applications per year}) \times \\ & (\text{time taken to complete a pesticide record}) \times (\text{opportunity cost of time}) \end{aligned}$$

The number of NSW businesses was obtained from ABS data (ABS 2007).

The number of applications per year was obtained by a survey of industry and government contacts.

Estimate of opportunity cost of time was derived from ordinary full-time adult earnings (\$1148.20) for NSW as at May 2008, plus 30% on-costs.

### *The base case*

Records that would be kept under the base case are assumed to be less detailed than those required under the proposed Regulation (taking only two minutes to complete).

Discussion with industry and government sources suggests that the proportion of records kept under the base case would be approximately 50% of all pesticide applications. This is mainly to satisfy the requirements of large supermarkets, various OH&S requirements, meet licence conditions for commercial pest controllers and aerial applicators, and for participation in trade with some countries.

The base case assumes that 100% of pest controllers would keep records (due to licence conditions).

However, records kept under the base case are less likely to be useful to DECC for compliance and enforcement.

### *The proposed Regulation*

All pesticide users would incur costs from keeping records, each record taking five minutes to complete.

Consultation with experts identified that in most cases it would only take two minutes to complete a pesticides use record that meets all the requirements of the Regulation. As records can be integrated with those kept for other purposes (invoicing, OH&S) and because there is no need to restate information common to multiple records (e.g. location), it is probably even easier to complete the record quickly so the time taken to complete records under the proposed Regulation is a conservative upper estimate of five minutes.

## Compliance

In the absence of the Regulation, DECC would still incur compliance and administration costs associated with the *Pesticides Act 1999*. The cost of administering the Act is estimated to be much greater than the cost to DECC of administering the Regulation.

## Appendix III: Distributional concerns of the proposed Regulation

Due to the small number of former Rural Lands Protection Boards (RLPBs) in NSW (47 in 2008) and the large number of pesticide treatments undertaken each year (estimated at more than 42,000 each), each former RLPB would have faced annual record-keeping costs of \$2800 under the proposed Regulation. Now that the RLPBs have been reorganised into 14 Livestock Health and Pest Authority (LHPA) districts, this equates to \$9400 per authority. This is the largest cost imposed on a single industry organisation as a result of the provisions in the proposed Regulation. However, these costs are heavily dependant on the large number of pesticide treatments undertaken by LHPAs in NSW. Keeping records of pesticide treatments is also important to other essential LHPA tasks, such as management activities relating to baiting for pest animals.

LHPAs are well aware of the benefits of appropriate controls over vertebrate pesticides and provide leadership to their ratepayers in best practice vertebrate pesticide management, which incorporates the proposed Regulation.

Costs incurred by individual local and state government agencies are also considerable. Annual costs attributable to the proposed Regulation incurred by individual local councils are estimated at \$4824 per council. Annual costs incurred by individual state government agencies are estimated at \$7074 per agency. These costs arise from requirements for notification of pest treatments in public places, user-training costs to staff and associated record-keeping. However, when compared with individual agency budgets, these costs do not impose a significant burden and align government agencies with best practice pesticide management.

Residents of multiple occupancy dwellings also incur costs from notification requirements for pest treatments in common areas. These costs are considered low, averaging \$24 per building per year.

The provisions in the proposed Regulation also impose costs on pest controllers, from sensitive place notification, record-keeping and user training. The average pest control business would incur \$1447 per year in costs attributable to the proposed Regulation. This may seem a significant cost considering that 27% of pest control operators receive annual revenues of less than \$50,000 and 41% receive between \$50,000 and \$100,000 (IBISWorld 2007, p.7). It is expected, however, that some of these industry costs could realistically be passed on to consumers of pest treatments, with the potential to increase the cost of an affected pest treatment by \$15 (assuming that the pest industry pass on all additional costs from notifying sensitive places for only those jobs requiring notification). In addition, if cost savings from access to pesticide use records accrued evenly to pest control businesses, there is unlikely to be a net cost.<sup>34</sup>

The user-training component of the proposed Regulation imposes potentially significant costs on employers of pesticide users, especially the self-employed and small businesses. Costs of training average \$500 per employee every five years. However, these costs to businesses could well be regarded as insurance against employee claims from the ill-effects of pesticide exposure, considering that the median cost of a worker's compensation claim for injury in NSW agriculture was \$910 (Franklin et al 2005).

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<sup>34</sup> The annual benefit to the average pest control business from a 1% reduction in pesticide use is likely to be \$1595.

## References

- ABS 2007, *Counts of Australian businesses, including entries and exits: June 2003 to June 2006*, Australian Bureau of Statistics Cat 8165.0.
- ABS 2008a, *Causes of death, Australia: 2006*, Australian Bureau of Statistics Cat 3303.0.
- ABS 2008b, *Causes of death data collection (HOIST)*, Centre for Epidemiology and Research, NSW Department of Health, Australian Bureau of Statistics.
- Australian Government 2007, *National residue survey 2006–2007: Results report*, prepared by the Department of Agriculture, Fisheries and Forestry, Canberra, Australia.
- Australian Safety and Compensation Council 2008, *The health of nations: The value of a statistical life*, prepared by Access Economics for the Australian Safety and Compensation Council.
- Baxter, GD, Green, P, Stuttgen, M and Barker, SC 1999, 'Detecting resistance to organophosphates and carbamates in the cattle tick, *Boophilus microplus*, with a propoxur-based biochemical test', *Experimental and applied acarology*, 23(11), November.
- Beard, J, Sladden, T, Morgan, G, Berry, G, Brooks, L and McMichael, A 2003, 'Health impacts of pesticide exposure in a cohort of outdoor workers', *Environmental health perspectives*, 111(5), May.
- Beeton, RJS, Buckley, KI, Jones, GJ, Morgan, D, Reichelt, RE and Trewin, D 2006, *Australia State of the Environment 2006: Independent report to the Australian Government Minister for the Environment and Heritage*, available at [www.environment.gov.au/soe/2006/publications/report/pubs/soe-2006-report.pdf](http://www.environment.gov.au/soe/2006/publications/report/pubs/soe-2006-report.pdf), cited on 08/12/2008.
- Boccaletti, S and Nardella, M 2000, 'Consumer willingness to pay for pesticide-free fresh fruit and vegetables in Italy', *International food and agribusiness management review*, 3(3): 297–310.
- Brown, TP, Rumsby, PC, Capleton, AC, Rushton, L and Levy, LS 2006, 'Pesticides and Parkinson's disease: Is there a link?', *Environmental health perspectives*, 114(2), February.
- Colborn, T 2006, 'A case for revisiting the safety of pesticides: A closer look at neurodevelopment', *Environmental health perspectives*, 114(1), January.
- Cotton Industry 2000, *Best management practice manual*, Discussion draft, 2nd edition, May.
- Cranfield, JAL and Magnusson, E 2003, 'Canadian consumers, willingness-to-pay for pesticide free food products: An ordered probit analysis', *International food and agribusiness management review*, 6(4): 13–30.
- DECC 2006, *Who cares about the Environment in 2006?*, Department of Environment and Climate Change NSW, Sydney, available at [www.environment.nsw.gov.au/community/whocares2006.htm](http://www.environment.nsw.gov.au/community/whocares2006.htm), cited on 08/12/2008.
- Devine, GJ and Furlong, MJ 2007, 'Insecticide use: Contexts and ecological consequences', *Agriculture and human values*, 24: 281–306.
- Farm Weekly 2007, 'Australian grain exporters have been placed on notice after irregular fenitrothion residue levels', Fairfax at <http://fw.farmonline.com.au/news/state/agribusiness-and-general/general/australian-grain-exporters-have-been-placed-on-notice-after-irregular-fenitrothion-residue-levels-we/13079.aspx>, cited on 08/12/2008.
- Fragar, LJ, Sankaran, B and Thomas, P 2005, *Pesticides and adverse health outcomes in Australia*, prepared for the Rural Industries Research and Development Corporation and the Australian Centre for Agricultural Health and Safety.

- Franklin, R, Thomas, P and Fragar, L 2005, *The health and safety of New South Wales farmers, farm families and farm workers*, prepared for the Rural Industries Research and Development Corporation.
- IBISWorld 2007, *IBISWorld industry report L7865: Pest control services in Australia*, IBISWorld Pty Ltd.
- Johnstone, K, Capra, M and Newman, B 2007, *Organophosphate pesticide exposure in agriculture workers: Human exposure and risk assessment*, prepared for the Rural Industries Research and Development Corporation, Canberra.
- Kent, J 1992, *Pesticides in agriculture*, paper presented at 25 Years of the Riverina Outlook Conference Wagga Wagga 1973 to 1998, The Farrer Centre, available from [www.regional.org.au/au/roc/1992/roc1992031.htm](http://www.regional.org.au/au/roc/1992/roc1992031.htm), cited on 08/12/2008.
- Leach, AW and Mumford, JD 2008, 'Pesticide environmental accounting: A method for assessing the external costs of individual pesticide applications', *Environmental pollution*, 151: 139–47.
- Leonard, A, Hyne, RV, Lim, RP, Pablo, F and Van Den Brink, P 2000, 'Riverine endosulfan concentrations in the Namoi River, Australia: Link to cotton field run-off and macroinvertebrate population densities', *Environmental toxicology and chemistry*, 19: 1540–51.
- Mueller, JF, Harden, F, Toms, LM, Symons, R and Fürst, P 2008, 'Persistent organochlorine pesticides in human milk samples from Australia', *Chemosphere*, 70: 712–20.
- Mullen, JD, Alston, JM, Kreith, MT and Kuminoff, NV 2003, *Returns to University of California pest management research and extension: Overview and case studies emphasizing IPM*, University of California Agriculture and Natural Resources, ANR Publication 3482, Oakland, May.
- Muschal, M and Warne, M 2003, 'Risk posed by pesticides to aquatic organisms in rivers of northern inland NSW, Australia', *Human and ecological risk assessment*, 9: 1765–87.
- Napier, GM, Fairweather, PG and Scott, AC 1998, 'Records of fish kills in inland waters of NSW and Queensland in relation to cotton pesticide', *Wetlands (Australia)*, 17: 60–71.
- NSW Government 2007, *NSW Government guidelines for economic appraisal*, prepared by the Office of Financial Management for the NSW Treasury, available from [www.treasury.nsw.gov.au/\\_\\_data/assets/pdf\\_file/0016/7414/tpp07-5.pdf](http://www.treasury.nsw.gov.au/__data/assets/pdf_file/0016/7414/tpp07-5.pdf), cited on 08/12/2008.
- NSW Government 2008, *Guide to better regulation*, report prepared by the Better Regulation Office for the NSW Department of Premier and Cabinet, Sydney.
- NSW Health 2008, NSW hospital separations due to injury/poisonings from the toxic effects of pesticides, internal communication.
- NSW Poisons Information Centre 2007, *Annual report 2007*, Poisons Information Centre, Children's Hospital Westmead, Sydney.
- OECD 1999, *Voluntary approaches for environmental policy: An assessment*, Organisation for Economic Cooperation and Development, Paris, available for purchase at [www.sourceoecd.org](http://www.sourceoecd.org), cited on 08/12/2008.
- Ott, SL 1990, 'Supermarket shoppers' pesticide concerns and willingness to purchase certified pesticide residue-free fresh produce', *Agribusiness*, 6(6): 593–602.
- Owens, EW 1986, 'Social control of pesticides: Some health effects', *International journal of social economics*, 3(2): 93–97.
- Pimentel, D 2005, 'Environmental and economic costs of the application of pesticides primarily in the United States', *Environment, development and sustainability*, 7: 229–52.

Pretty, JN 2005, *The pesticide detox: Towards a more sustainable agriculture*, Earthscan, London, UK.

Reserve Bank of Australia 2008, *Financial markets (F tables): Exchange rates F11*, available from [www.rba.gov.au/Statistics/Bulletin/index.html](http://www.rba.gov.au/Statistics/Bulletin/index.html), cited on 08/12/2008.

Science Alert 2007, *Herbicide resistant ryegrass spreads*, 20 September, 2007, [www.sciencealert.com.au/news/20072009-16351-2.html](http://www.sciencealert.com.au/news/20072009-16351-2.html), cited on 08/12/2008.

United Nations/IOMC 1998, *Key elements of a national program for chemicals management and safety*, available from [www.unitar.org/cwm/publications](http://www.unitar.org/cwm/publications), cited on 08/12/2008.

US National Cancer Institute 2007, 'Cancer trends progress report: 2007 update', available at [progressreport.cancer.gov/doc\\_detail.asp?pid=1&did=2007&chid=71&coid=713&mid=](http://progressreport.cancer.gov/doc_detail.asp?pid=1&did=2007&chid=71&coid=713&mid=), cited on 08/12/2008.

WorkCover NSW 2006a, *Safe use and storage of chemicals (including pesticides and herbicides) in agriculture*, available at [www.workcover.nsw.gov.au/Documents/Publications/LawandPolicy/CodesOfPractice/chemicals\\_in\\_agriculture\\_safe\\_use\\_storage\\_code\\_practice\\_0422.pdf](http://www.workcover.nsw.gov.au/Documents/Publications/LawandPolicy/CodesOfPractice/chemicals_in_agriculture_safe_use_storage_code_practice_0422.pdf)

WorkCover NSW 2006b, *Safe use of pesticides including herbicides in non-agricultural workplaces*, available at [www.workcover.nsw.gov.au/Documents/Publications/LawandPolicy/CodesOfPractice/safe\\_use\\_pesticides\\_nonagricultural\\_workplaces\\_code\\_practice\\_0421.pdf](http://www.workcover.nsw.gov.au/Documents/Publications/LawandPolicy/CodesOfPractice/safe_use_pesticides_nonagricultural_workplaces_code_practice_0421.pdf)



**Draft  
Pesticides Regulation 2009**



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# Public consultation draft

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New South Wales

## Pesticides Regulation 2009

under the

Pesticides Act 1999

*[The following enacting formula will be included if the Regulation is made:]*

Her Excellency the Governor, with the advice of the Executive Council, has made the following Regulation under the *Pesticides Act 1999*.

Minister for Climate Change and the Environment

### **Explanatory note**

The object of this Regulation is to remake, with some amendments, the provisions of the *Pesticides Regulation 1995*, which is repealed on 1 September 2009 by section 10 (2) of the *Subordinate Legislation Act 1989*.

The amendments made by this Regulation include removing redundant provisions, increasing the penalty notice amounts payable in respect of certain offences relating to the keeping of records, permitting a penalty notice to be issued in respect of the offence of failing to provide a copy of a record to an authorised officer, removing a fee for a certificate to authorise the use or possession of a restricted pesticide and removing provisions enabling the Environment Protection Authority to conduct qualifying examinations.

This regulation makes provision with respect to the following:

- (a) licences and approvals for the application of pesticides from an aircraft,
- (b) the persons qualified to use pesticides,
- (c) the records required to be kept with respect to the use of pesticides,
- (d) the obligation of public authorities to prepare pesticide use notification plans,
- (e) the obligation of persons who engage pesticide management technicians to use pesticides in common areas of residential complexes to give prior notification to residents,
- (f) the obligation of pesticide management technicians to notify persons when using a pesticide in a common area of a residential complex or near a sensitive place,
- (g) the control of prohibited residues in agricultural produce,

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# Public consultation draft

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Pesticides Regulation 2009

Explanatory note

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(h) the offences under the *Pesticides Act 1999* or this Regulation for which penalty notices (“on-the-spot” fines) may be issued and the amounts of the fines payable under such notices,

(i) savings and formal matters.

This Regulation is made under the *Pesticides Act 1999*, including sections 46 (2) (b), (3) (c) and (4) (b), 48 (2) (b) and (3) (b), 54 (2) (g), 63 (1) and (2) (a), 75 (1), 78 (1), 117 and 119 (the general regulation-making power).

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# Public consultation draft

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Pesticides Regulation 2009

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Pesticides Regulation 2009

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# Public consultation draft

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Clause 1            Pesticides Regulation 2009

Part 1             Preliminary

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## Pesticides Regulation 2009

under the

Pesticides Act 1999

### Part 1 Preliminary

#### 1 Name of Regulation

This Regulation is the *Pesticides Regulation 2009*.

#### 2 Commencement

This Regulation commences on 1 September 2009.

**Note.** This Regulation replaces the *Pesticides Regulation 1995* which is repealed on 1 September 2009 by section 10 (2) of the *Subordinate Legislation Act 1989*.

#### 3 Definitions

(1) In this Regulation:

**domestic purposes** includes home gardening.

**Food Standards Code** means the *Australia New Zealand Food Standards Code* as defined in the *Food Standards Australia New Zealand Act 1991* of the Commonwealth.

**fumigant** has the same meaning as in clause 265 of the *Occupational Health and Safety Regulation 2001*.

**MRL Standard** means the document entitled *The MRL Standard—Maximum residue limits in food and animal feedstuff* published by the Australian Pesticides and Veterinary Medicines Authority.

**powered spray equipment** means spray equipment that is powered otherwise than by human energy.

**registered training organisation** has the same meaning as in the *Vocational Education and Training Act 2005*.

**spray equipment** means any device or apparatus that distributes pesticide through the air, and includes powered spray equipment.

**the Act** means the *Pesticides Act 1999*.

**use** does not include store.

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## Public consultation draft

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Clause 3            Pesticides Regulation 2009

Part 1              Preliminary

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- (2) For the purposes of this Regulation, a quantity of pesticide is not appropriate for domestic purposes if the quantity is more than:
  - (a) if the pesticide is being used outside a building—20 litres or 20 kilograms of “ready-to-use” pesticide or 5 litres or 5 kilograms of concentrated pesticide, or
  - (b) if the pesticide is being used inside a building—5 litres or 5 kilograms of “ready-to-use” pesticide or 1 litre or 1 kilogram of concentrated pesticide.
- (3) Notes included in this Regulation do not form part of this Regulation.



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# Public consultation draft

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Pesticides Regulation 2009

Clause 4

Licences and approvals for the application of pesticides from aircraft

Part 2

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## **Part 2 Licences and approvals for the application of pesticides from aircraft**

### **4 Application for licence**

- (1) For the purposes of section 46 (2) (b) of the Act, \$50 is the prescribed fee to accompany an application for a licence.
- (2) The fee to accompany an application for a pilot (pesticide rating) licence may be waived if the applicant is the holder of a current equivalent licence issued in another State or a Territory.

### **5 Particulars to accompany application for licence**

- (1) For the purposes of section 46 (3) (c) of the Act, an application for a licence is to be accompanied by evidence that the applicant holds the qualifications prescribed by clause 6 (1).
- (2) For the purposes of section 46 (4) (b) of the Act, the following particulars are required to accompany an application for a pilot (pesticide rating) licence:
  - (a) evidence that the applicant holds the qualifications prescribed by clause 6 (2),
  - (b) if the licence is to be restricted to particular pesticides, details of those pesticides,
  - (c) particulars of any licence or certificate issued to the applicant in New South Wales or any other State or Territory in relation to the aerial application of pesticides or of any refusal to issue, or the cancellation or suspension of, any such licence or certificate.

### **6 Prescribed qualifications for issue of licence**

- (1) For the purposes of section 48 (2) (b) of the Act, an applicant for an aircraft (pesticide applicator) licence holds the prescribed qualifications if the applicant holds an Air Operator's Certificate endorsed for agricultural operations and issued under Division 2 of Part III of the *Civil Aviation Act 1988* of the Commonwealth.
- (2) For the purposes of section 48 (3) (b) of the Act, an applicant for a pilot (pesticide rating) licence has the prescribed qualifications if:
  - (a) the applicant holds a current commercial pilot (aeroplane) licence or commercial pilot (helicopter) licence issued under the *Civil Aviation Regulations 1988* of the Commonwealth endorsed with an agricultural rating, and
  - (b) the applicant:

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# Public consultation draft

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Clause 7            Pesticides Regulation 2009

Part 2              Licences and approvals for the application of pesticides from aircraft

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- (i) is the holder of a certificate of approval issued under the Spray Safe Accreditation Program conducted by the Aerial Agricultural Association of Australia, or
- (ii) has passed an examination conducted in accordance with the requirements of another State or Territory for the purpose of obtaining a licence equivalent to a pilot (pesticide rating) licence.

## **7 Records of aerial application of pesticides**

For the purposes of section 54 (2) (g) of the Act, the following additional particulars are required to be contained in the record:

- (a) a description of the crop in respect of which the pesticide was applied or other situation in which it was used,
- (b) the rate of application of the pesticide and the quantity applied,
- (c) the name, address and contact details of the owner or occupier of the land on which the pesticide was applied.

## **8 Provision of record to land owner or occupier**

The holder of an aircraft (pesticide applicator) licence must provide a copy of a record required to be made under section 54 of the Act to the owner or occupier of the land on which the pesticide was applied. The record must be provided as soon as practicable after the application of the pesticide.

Maximum penalty:

- (a) in the case of a corporation—100 penalty units, and
- (b) in the case of an individual—50 penalty units.

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# Public consultation draft

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Pesticides Regulation 2009

Clause 9

Pesticides to be used by qualified persons

Part 3

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## Part 3 Pesticides to be used by qualified persons

### 9 Persons qualified to use pesticides

- (1) In this Part, a person is qualified to use a pesticide if the person holds any one or more of the following:
- (a) a licence under the Act,
  - (b) a certificate of competency or recognised qualification (within the meaning of Part 9.1 of the *Occupational Health and Safety Regulation 2001*) in relation to the kind of work referred to in clause 11 (Application of pesticides) or 12 (Use of fumigants) of the Schedule to clause 266 of that Regulation,
  - (c) a current certificate of completion or statement of attainment on completion:
    - (i) of a kind, and issued by a university, industry body or other organisation, that the Environment Protection Authority has declared by order published in the Gazette, to be sufficient for the purposes of this subclause, and
    - (ii) that was current immediately before 1 September 2005, and
    - (iii) that was issued within the last 5 years,
- Note.** This provision will cease to apply on or after 1 September 2010.
- (d) a current certificate of completion or statement of attainment on completion of a course of study with respect to the use of pesticides that was issued to the person within the last 5 years:
    - (i) by a registered training organisation in accordance with the Australian Qualifications Framework, and
    - (ii) in recognition of the person's satisfactory achievement of specified units of competency or parts of units of competency (being units of competency, or parts of units of competency, that, at the time the prescribed qualification is issued, are approved by the Environment Protection Authority in accordance with Schedule 1),
  - (e) a pest control operator's licence that:
    - (i) was in force under the *Occupational Health and Safety (Pest Control) Regulation 1988* immediately before its repeal, and
    - (ii) is taken to be a certificate of competency under clause 268 of the *Occupational Health and Safety Regulation 2001*,
  - (f) if the pesticide is a fumigant—a fumigation permit that:

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## Public consultation draft

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Clause 10            Pesticides Regulation 2009

Part 3                Pesticides to be used by qualified persons

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- (i) was in force under the *Occupational Health and Safety (Pest Control) Regulation 1988* immediately before its repeal, and
  - (ii) is taken to be a certificate of competency under clause 268 of the *Occupational Health and Safety Regulation 2001*.
- (2) In this clause:  
*Australian Qualifications Framework* has the same meaning as in section 7 of the *Higher Education Act 2001*.

### **10 Person must not use pesticide unless qualified**

- (1) A person must not use, or employ or engage a person to use, a pesticide in any of the following circumstances unless the person using the pesticide is qualified to use the pesticide:
- (a) in the course of carrying on, or working in, a business, educational institution or hospital (whether as principal, contractor or employee, and regardless of whether, in the case of a business, the use of pesticides is a purpose of the business concerned),
  - (b) in the course of acting as, or for or on behalf of, the landlord of any premises,
  - (c) in the course of acting for or on behalf of a public authority,
  - (d) in the course of carrying out pest control operations on a golf course, sporting field or bowling green,
  - (e) in connection with any agricultural operations (including farming, horticultural or aquacultural operations) or forestry operations.
- Maximum penalty: 200 penalty units (in the case of an individual) or 400 penalty units (in the case of a corporation).
- (2) Subclause (1) does not apply in any of the following circumstances:
- (a) if the pesticide is being used in public baths or in any swimming pool or spa,
  - (b) if the person is a trainee doing work of the type referred to in clause 11 (Application of pesticides) or 12 (Use of fumigants) of the Schedule to clause 266 of the *Occupational Health and Safety Regulation 2001* and who is excepted under clause 271 of that Regulation from the requirement of that Regulation to hold a certificate of competency or recognised qualification in relation to that work,
  - (c) if the pesticide is used in connection with agricultural operations or forestry operations and the person used the pesticide:

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# Public consultation draft

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Pesticides Regulation 2009

Clause 11

Pesticides to be used by qualified persons

Part 3

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- (i) by means of hand-held and hand-powered equipment, and
- (ii) on no more than 12 days in the previous 12 months and on no more than 4 days in the previous month, and
- (iii) under the direct supervision of a supervisor who was qualified to use the pesticide and who selected and prepared the pesticide, tested and calibrated the equipment before it was used, and instructed the person in how to apply the pesticide,
- (d) if the pesticide:
  - (i) is widely available to the general public at retail outlets and is ordinarily used for domestic purposes, and
  - (ii) is being applied for a domestic purpose by hand or hand-held applicator, and
  - (iii) is being used in a quantity that is appropriate for the domestic purpose.

## 11 Supervision of persons

A person must not supervise a person in the use of a pesticide in connection with any agricultural operations or forestry operations unless the person supervising or the person being supervised is qualified to use the pesticide.

Maximum penalty: 200 penalty units.

## 12 Offences with respect to qualifications

- (1) A person who is required to be qualified in respect of the use, or supervision of the use, of a pesticide must, if requested to do so by an authorised officer, produce evidence of the qualification concerned for inspection by the authorised officer.  
Maximum penalty: 200 penalty units.
- (2) A person must not forge or alter evidence of a qualification.  
Maximum penalty: 100 penalty units.
- (3) A person must not falsely represent, whether in writing, by word or by conduct, that he or she is qualified to use a pesticide.  
Maximum penalty: 100 penalty units.
- (4) In this clause, a reference to evidence of a qualification is a reference to:
  - (a) in the case of a permit or licence, the permit or licence concerned, and
  - (b) in the case of any other qualification:
    - (i) a document that is issued to a person as the qualification concerned achieved by that person, or

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## Public consultation draft

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Clause 12      Pesticides Regulation 2009

Part 3          Pesticides to be used by qualified persons

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- (ii) a document (including a card) that is issued to the holder of the qualification concerned by a registered training organisation, or other person or body approved by the Authority, as a record or evidence (or both) of the person's achievement of that qualification.

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# Public consultation draft

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Pesticides Regulation 2009

Clause 13

Records relating to use of pesticides

Part 4

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## Part 4 Records relating to use of pesticides

### 13 Pesticides used for commercial, agricultural or occupational purposes

- (1) A person must cause a record to be made, in accordance with this Part, that relates to each occasion on which the person uses a pesticide:
- (a) in the course of carrying on a business involving the use of pesticides (regardless of whether that use is the primary purpose of the business concerned), or
  - (b) in the course of acting as, or for or on behalf of, the landlord of any premises, or
  - (c) in the course of acting for or on behalf of a public authority, or
  - (d) in the course of carrying out pest control operations on a golf course, sporting field or bowling green, or
  - (e) while treating livestock for ectoparasites by means of a dip bath or by the use of powered spray equipment that is not hand held, or
  - (f) while treating harvested horticultural crops by means of a dip bath, or
  - (g) while using any spray equipment to apply a pesticide for horticultural purposes (including the spraying of fallow crop land), but not if
    - (i) the application consists of spot spraying that is confined to a small and restricted area on or within a tree crop, and
    - (ii) the pesticide is applied by hand held and hand powered equipment only, and
    - (iii) the pesticide is applied no closer than 20 metres to a property boundary, or
  - (h) while using any powered spray equipment to spray crops, fallow crop land or trees in a plantation (including in or around such trees), or
    - (i) while using powered spray equipment that is mounted on or attached to a vehicle and is not hand-held, or
    - (j) while applying baits to control vertebrate pests (other than baits that are used to control rodents in or around buildings).
- Maximum penalty: 400 penalty units in the case of a corporation, or 200 penalty units in the case of an individual.
- (2) Despite subclause (1), a person is not required to cause a record to be made in the following circumstances:
- (a) if the pesticide is being used in public baths or in any swimming pool or spa,

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## Public consultation draft

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Clause 14            Pesticides Regulation 2009

Part 4                Records relating to use of pesticides

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- (b) if the pesticide is being used in aerial pesticide operations for which a licence is required under the Act,
- (c) if the pesticide:
  - (i) is widely available to the general public at retail outlets and is ordinarily used for domestic purposes, and
  - (ii) is being applied for a domestic purpose by hand or hand-held applicator, and
  - (iii) is being used in a quantity that is appropriate for the domestic purpose.
- (3) If a pesticide is being used by a person on behalf of a public authority by means of hand-held applicator under the supervision or direction of a supervisor who has responsibility for the operations, the supervisor is taken to be the person using the pesticide for the purposes of subclause (1).
- (4) In this clause:  
*horticultural crops* means fruit, vegetables, flowers, nuts and herbs.

### **14 Information to be contained in record**

- (1) A record required to be made under this Part must contain the following information:
  - (a) the full product name of the pesticide applied,
  - (b) a description of the crop in respect of which the pesticide was applied or other situation in which it was used,
  - (c) the rate of application of the pesticide and the quantity applied,
  - (d) a description of the equipment used to apply the pesticide,
  - (e) the address of the property and the delineation of the area in which the pesticide was released and, in the case of a record under clause 13 (1) (g)–(j), the order in which areas (such as paddocks or sheds) were treated,
  - (f) the date and time of the application of the pesticide (including the start and finish time),
  - (g) the name, address and contact details of the person who applied the pesticide or, if the pesticide was applied by a person employed to apply the pesticide, the name of the employee and the name, address and contact details of the employer,
  - (h) the name, address and contact details of the owner or occupier of the land in respect of which the pesticide was applied (if the information is not the same as the information required by paragraph (g)),



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# Public consultation draft

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Pesticides Regulation 2009

Clause 15

Records relating to use of pesticides

Part 4

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- (i) if, because of clause 13 (3), the record is required to be made by a supervisor—the name of each person who used the pesticide under the supervision or direction of the supervisor,
- (j) if the pesticide is applied outdoors by means of any spray equipment:
  - (i) the estimated wind speed and direction at the start of the application and whenever there is any significant change during the application, and
  - (ii) if other weather conditions (such as temperature, humidity or rainfall conditions) are specified on the pesticide label as being relevant for the proper use of the pesticide—a description of those conditions at the start of the application and whenever there is any significant change during the application.
- (2) The record must:
  - (a) be made as soon as practicable after the use of the pesticide concerned and, in any event, no later than 24 hours after the pesticide is used, and
  - (b) be written legibly in the English language.

## **15 Keeping and provision of records**

- (1) A person who is required to make a record under clause 13 (1), or who is provided with a record or copy under subclause (2) or (3), must keep the record or copy for a period of not less than 3 years after the date on which the record was made.
- (2) A person, employed under a contract of employment and who carries out operations involving the use of pesticides in the course of that employment, who is required to make a record under clause 13 (1) (c)–(j) is not required to keep the record but must provide the record to the person’s employer.
- (3) A person, who is engaged (other than under a contract of employment) for fee or reward to carry out operations involving the use of pesticides, who is required to make a record under clause 13 (1) (c)–(j) must provide a copy of the record to the owner or occupier of the land on which the pesticide was applied.
- (4) A person must not, in any record required to be made under this Part, make any statement, or include any information, that is false or misleading in a material particular.  
Maximum penalty: 400 penalty units in the case of a corporation, or 200 penalty units in the case of an individual.

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## Public consultation draft

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Clause 16          Pesticides Regulation 2009

Part 4              Records relating to use of pesticides

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### **16 Exemption from record keeping requirements**

- (1) The Environment Protection Authority may, by notice published in the Gazette, exempt a specified person or specified class of persons from any requirement under this Part.
- (2) Without limiting subclause (1), an exemption may relate to particular kinds of information referred to in clause 14.
- (3) Before making an exemption under this clause, the Environment Protection Authority is required to consult with such persons or bodies as the Authority considers appropriate (including the representatives of any relevant environmental or industry group).

### **17 Integration with other record keeping requirements**

The Environment Protection Authority may approve, either in a particular case or generally, the integration of records that are required to be made and kept under this Part with other records that are required to be made and kept under any other law.

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# Public consultation draft

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Pesticides Regulation 2009

Clause 18

Notification of proposed use of pesticide

Part 5

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## Part 5 Notification of proposed use of pesticide

### Division 1 Preliminary

#### 18 Definitions

In this Part:

**pest management technician** means a person who holds a qualification referred to in clause 9 (1) (b), (e) or (f) or who is a trainee referred to in clause 10 (2) (b).

**pesticide use notification plan**—see clause 19 (1) (a).

**prescribed public place** means:

- (a) any of the following to which the public is entitled to have access (whether or not on payment of a fee):
  - (i) a public garden, picnic area, playground, park, sporting field or oval,
  - (ii) public land owned or controlled by a public authority (for example, a road verge, rail easement or an easement for electricity purposes or for the purposes of other utilities),
  - (iii) land reserved under the *National Parks and Wildlife Act 1974* or any State forest or Crown land, or
- (b) the grounds of any government school (within the meaning of the *Education Act 1990*) or any establishment maintained by the Technical and Further Education Commission,

but does not include the inside of any building or structure located at such a place.

**public authority**, in addition to the meaning given by the Act, includes a Minister.

**sensitive place** means any of the following:

- (a) a school, pre-school, kindergarten or childcare centre,
- (b) a hospital, community health centre or nursing home,
- (c) any place declared to be a sensitive place by the Environment Protection Authority by order in the Gazette.

### Division 2 Notification by public authorities

#### 19 Obligations on public authorities concerning use of pesticide

- (1) A public authority must not use, or allow any person to use, any pesticide in a prescribed public place that is owned by or is under the control of the public authority unless the public authority has first:

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# Public consultation draft

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Clause 20	Pesticides Regulation 2009
Part 5	Notification of proposed use of pesticide

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- (a) prepared, finalised and notified the Environment Protection Authority of a plan (a *pesticide use notification plan*) in accordance with this Division, and
- (b) given public notice of the proposed use of pesticide in accordance with that plan.

Maximum penalty:

- (a) in the case of a corporation—400 penalty units, and
  - (b) in the case of an individual—200 penalty units.
- (2) A public authority may satisfy a requirement under this clause if it prepares and notifies one or more pesticide use notification plans that apply to all prescribed public places that it owns or controls.
- (3) Subclause (1) does not apply in respect of the use of pesticide in a prescribed public place that is owned by or is under the control of a public authority if the pesticide is used by another public authority and that other public authority has:
- (a) prepared, finalised and notified the Environment Protection Authority of a pesticide use notification plan in accordance with this Division, and
  - (b) given public notice in accordance with that plan.
- (4) Subclause (1) does not apply in relation to the use of pesticide in public baths or in any swimming pool or spa.

## **20 Contents of pesticide use notification plans**

- (1) A public authority's pesticide use notification plan:
- (a) must set out how and when the public authority will give public notice of the proposed use of pesticides in any prescribed public places, and
  - (b) must identify where the plan operates, that is, it must identify the categories of prescribed public places in which the public authority proposes to use pesticide or allow its use, and
  - (c) must identify the categories of, or specific, prescribed public places in respect of which the public authority intends to provide notification of:
    - (i) all proposed uses of pesticides under the plan, or
    - (ii) only some proposed uses of pesticides under the plan, and what those uses are, and
  - (d) must indicate, as a separate item, the special protection measures that will be taken if the pesticide is proposed to be used in a prescribed public place that is adjacent to a sensitive place, and

























