

DRAFT Safe use and storage of agricultural and veterinary chemicals

Code of practice

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Editorial note

This Code of practice (this Code) should be read in its entirety.

When reading this Code, please be aware that any reference to:

- the 'Work Health and Safety Act' refers to the *Work Health and Safety Act 2011* (NSW), or any successor legislation,
- the 'Work Health and Safety Regulation' refers to the *Work Health and Safety Regulation 2025* (NSW), or any successor regulation,
- a code of practice refers to the relevant NSW Code of practice, or any successor code of practice.

This Code may contain references to relevant withdrawn or superseded Australian Standards or Australian/New Zealand Standards.

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Acknowledgment

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Foreword

This Code of practice (this Code) on how to manage work health and safety risks of safe use and storage of agricultural and veterinary chemicals is an approved code of practice under section 274 of the *Work Health and Safety Act 2011* (the WHS Act).

An approved code of practice provides practical guidance on how to achieve the standards of work health and safety required under the WHS Act and the Work Health and Safety Regulation (the WHS Regulation) and effective ways to identify and manage risks.

A code of practice can assist anyone who has a duty of care in the circumstances described in the code of practice. Following an approved code of practice will assist the duty holder to achieve compliance with the health and safety duties in the WHS Act and WHS Regulation, in relation to the subject matter of the code of practice. Like regulations, codes of practice deal with particular issues and may not cover all relevant hazards or risks. The health and safety duties require duty holders to consider all risks associated with work, not only those for which regulations and codes of practice exist.

Codes of practice are admissible in court proceedings under the WHS Act and WHS Regulation. Courts may regard a code of practice as evidence of what is known about a hazard, risk, risk assessment or risk control and may rely on the code in determining what is reasonably practicable in the circumstances to which the code of practice relates. For further information see Safe Work Australia's *Interpretive Guideline: The meaning of 'reasonably practicable'*.

Compliance with the WHS Act and WHS Regulation may be achieved by following another method if it provides an equivalent or higher standard of work health and safety than the code.

An inspector may refer to an approved code of practice when issuing an improvement or prohibition notice.

Scope and application

This Code is intended to be read by a person conducting a business or undertaking (PCBU). It provides practical guidance to PCBUs on how to manage risks to health and safety associated with the safe use and storage of agricultural and veterinary chemicals.

This Code should be read in conjunction with the:

- *Code of Practice: Managing risks of hazardous chemicals in the workplace*
- *Code of Practice: Labelling of workplace hazardous chemicals*
- *Code of Practice: Preparation of safety data sheets for hazardous chemicals*
- other approved codes of practice for guidance on managing the risk of specific hazards.

This Code applies to all types of work and all workplaces covered by the WHS Act where agricultural and veterinary chemicals (e.g. pesticides, fertilisers, cleaning agents, disinfectants, degreasers, solvents, fuels, dyes and antiseptics) are used and stored.

This Code is beneficial for a wide range of audiences, including:

- persons involved in farming like farmers, pastoralists, horticulturalists, orchardists, and foresters,
- non-farming professionals such as contractors, council workers, groundskeepers, and greenkeepers who use pesticides in their work,
- pest controllers and urban pest control operators who apply pesticides both in the field and, in and around buildings.

It does not apply to the manufacture, warehousing, distribution or sale of chemicals.

This Code may be a useful reference for other persons interested in the duties under the WHS Act and WHS Regulation. Trainers, educators, medical practitioners and government officers may also find this Code provides useful background material which will assist in providing advice to their clients.

How to use this Code of Practice

This Code includes various references to the legal requirements under the WHS Act and WHS Regulation. These references are included for convenience only and should not be relied on in place of the full text of the WHS Act or WHS Regulation. The words 'must', 'requires' or 'mandatory' indicate a legal requirement exists that must be complied with.

The word 'should' is used in this Code to indicate a recommended course of action, while 'may' is used to indicate an optional course of action.

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1. Introduction

1.1 What is the safe use and storage of agricultural and veterinary chemicals?

The safe use and storage of agricultural and veterinary chemicals is critical for ensuring the health and safety of workers, protecting the environment, and complying with regulations. Farms and agricultural industries use many agricultural and veterinary chemicals in their day-to-day activities, such as pesticides, fertilisers, cleaning agents, disinfectants, degreasers, solvents, fuels, dyes and antiseptics.

Safe use includes how these chemicals are prepared, diluted, mixed, applied and administered, and storage includes transportation and where and how they are kept while not in use.

This Code provides practical guidance to minimise risks when handling, applying, and storing of agricultural and veterinary chemicals that are classified as hazardous chemicals under WHS legislation.

1.2 Who has health and safety duties?

There are a number of duty holders who have a role in managing the risks associated with the use and storage of agricultural and veterinary chemicals, including those listed below.

A person can have more than one duty and more than one person can have the same duty at the same time.

The main duty holders and key legislative provisions have been referenced in the table below, however the list is not exhaustive.

Duty holder	Application
Person conducting a business or undertaking (PCBU) WHS Act sections 19, 46 and 47 WHS Regulation section 49, 55C, 341-347, 359 and 368	A PCBU must eliminate risks to health and safety arising from storing and using agricultural and veterinary chemicals, or if that is not reasonably practicable, minimise the risks so far as is reasonably practicable. This includes: • the provision and maintenance of a work environment without risks to health and safety, • the provision and maintenance of safe plant and structures, • the provision and maintenance of safe systems of work, • the safe use, handling, and storage of plant, structures and substances, • the provision of information, training, instruction and supervision necessary to protect people from risks to health and safety, • the provision of adequate facilities for the welfare at work of workers, • monitoring the health and conditions of the workplace to prevent illness and injury, • managing psychosocial hazards,

	- ensuring hazardous chemicals used, handled or stored are correctly labelled, - obtaining and providing workers access to safety data sheets (SDS), - providing health monitoring (where relevant), - maintaining a register and manifest (where relevant) of hazardous chemicals, - providing fire protection and firefighting equipment, - ensuring exposure standards are not exceeded. PCBUs also have duties to: - consult workers about work health and safety, - consult, cooperate and coordinate with other duty holders, - ensure that the health and safety of other persons is not put at risk from work carried out as part of the conduct of the business or undertaking.
Designers, manufacturers, importers, installers and suppliers of plant, substances or structures WHS Act sections 22-26 WHS Regulation section 330, 334, 335 and 339	Must ensure, so far as is reasonably practicable, the plant / substances / structures they design, manufacture, import, supply or install are, so far as is reasonably practicable, without risks to health and safety including carrying out testing and analysis and providing adequate information about the risks posed to users of the plant, substances or structures. The manufacturer or importer of the hazardous chemical must: - prepare an SDS for the hazardous chemical, - review the SDS at least once every 5 years, - amend the SDS whenever necessary to ensure that it contains correct and current information, - ensure the hazardous chemical is correctly packed, - ensure the hazardous chemical is correctly labelled. Note – information on labelling of agricultural and veterinary (AgVet) chemicals is provided below this table. The manufacturer or importer of the hazardous chemical must provide the current SDS for the hazardous chemical to any person, if the person: - is likely to be affected by the hazardous chemical, and - requests the SDS. Suppliers must provide a SDS for each hazardous chemical on first supply to a workplace, upon request or when the hazardous chemical has been modified. Note - this does not apply to a supplier of a hazardous chemical if the hazardous chemical is a consumer product, or the supplier is a retailer. For example: Hardware stores and supermarkets supplying generally to the consumer market are not required to provide SDS however agricultural resellers who supply to farms and other workplaces in

	quantities above usual consumer quantities are required to supply SDS as they are normally supplying for use in workplaces.
Officers WHS Act section 27	Officers of the PCBU must exercise due diligence to ensure the PCBU complies with the WHS Act and WHS Regulation. This includes maintaining up to date WHS knowledge and taking reasonable steps to ensure the business or undertaking has and uses appropriate resources and processes to eliminate or minimise risks to health and safety from storing and using agricultural and veterinary chemicals. Further information on who is an officer and their duties is available in Safe Work Australia's <i>Interpretive Guideline: The health and safety duty of an officer</i>.
Workers WHS Act section 28 WHS Regulation section 46	While at work, workers must: • take reasonable care for their own health and safety, • take reasonable care that their actions or omissions do not adversely affect the health and safety of other persons, • comply with any reasonable instructions given by the PCBU, as far as they are reasonably able, • cooperate with any reasonable health and safety policies or procedures of the PCBU. If personal protective equipment (PPE) is provided by the PCBU, the worker must, so far as they are reasonably able, use or wear it in accordance with the information, instruction and training provided.
Other persons at the workplace WHS Act section 29	A person at a workplace must: • take reasonable care for their own health and safety, • take reasonable care that their acts or omissions do not adversely affect other people's health and safety, • comply, so far as they are reasonably able, with reasonable instructions given by the PCBU to allow the PCBU to comply with the WHS Act.

AgVet chemicals labelling

AgVet chemicals must comply with the labelling requirements under the *Agricultural and Veterinary Chemicals Code Act 1994*. If an AgVet chemical is also classified as a workplace hazardous chemical, it must meet additional workplace labelling requirements under the WHS Regulation, as outlined in Section 3.10 of the *Code of Practice: Labelling of workplace hazardous chemicals*.

However, veterinary chemical products are exempt from these additional workplace labelling requirements if they:

- are defined as veterinary chemical products under the *Agricultural and Veterinary Chemicals Code Act 1994*, and
 - are listed in Part 4 of Schedule 4 of the Poisons Standard and packaged for direct therapeutic administration to animals, or
 - are listed in Part 4 of Schedule 8 of the Poisons Standard.

Labelling of AgVet chemicals is regulated by the Australian Pesticides and Veterinary Medicines Authority (APVMA). For more information, visit www.apvma.gov.au.

The Pesticides Act 1999 (Pesticides Act)

PCBU's may also be liable for any breaches of *The Pesticides Act 1999* (Pesticides Act), where the breach resulted from the activity of workers. For more information on the provisions of this Pesticides Act contact the NSW Environment Protection Authority.

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1.3 Consultation

This table includes recommendations in how to comply with the WHS legislative requirements.

Duty / Provisions	Application
Consulting workers WHS Act sections 47 - 49	• PCBU's have a duty to consult with workers, so far as reasonably practicable, on WHS matters which affect them. • Consultation is a two-way process with workers to identify WHS issues, share information, give workers a reasonable opportunity to express views and take those views into account before making decisions about health and safety matters. • While consultation may not always result in agreement, agreement should be the objective as it will make it more likely the decisions are effective and actively supported. • Workers should be encouraged to report hazards and health and safety problems immediately so the risks can be managed before an incident occurs. • If workers are represented by a health and safety representative, the consultation must involve that representative. • Workers must be advised of consultation outcomes in a timely manner. • PCBU's must have effective mechanisms to consult with workers, including when: — identifying hazards and assessing risks, — making decisions about ways to eliminate or control risks, — changing or updating workplace facilities, — proposing changes that may affect the health and safety of workers, — making decisions about consultation procedures, resolving safety issues, monitoring workers' health and conditions, and providing information and training, — selecting new equipment, — introducing new tasks, changing existing tasks or carrying out work in new environments.
Consulting, cooperating and coordinating activities with other duty holders WHS Act section 46	• PCBU's must, as far as reasonably practicable, consult, cooperate and coordinate activities with all other persons who have a WHS duty in relation to the same matter. • Duty holders should exchange information about who is doing what to ensure effective coordination of works and management of risks, this includes: — the PCBU engages workers to carry out work, — the PCBU directs or influences workers in carrying out work, — other persons may be put at risk from work carried out in their business or undertaking, — the PCBU manages or controls a workplace or the fixtures, fittings or plant at a workplace,

	– the PCBU's business or undertaking involves designing, manufacturing, importing or supplying plant, substances or structures for use at a workplace, – the PCBU's business or undertaking involves installing, constructing or commissioning plant or structures at a workplace.
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Further guidance on consultation requirements is available in the *Code of practice: Work health and safety consultation, cooperation and coordination*.

1.4 Information, training, instruction and supervision

Duty / Provisions	Application
Information, training, instruction or supervision WHS Act section 19 WHS Regulation sections 39 and 379	• PCBUs must provide any information, training, instruction, or supervision necessary to protect all persons from health and safety risks, including when using storing and using agricultural and veterinary chemicals. • The information, training and instruction: – must be suitable and adequate for the nature of the works, risks and control measures implemented, – must be readily understandable to the person it is being provided to, so far as is reasonably practicable, – should be supported by relevant safe work procedures, i.e. emergency procedures, traffic rules, PPE, – training should be provided to workers by a competent person, – training programs should be practical and 'hands on' and take into account the particular needs of workers, – should include understanding and interpreting the information on labels and SDS (e.g. safety directions, first aid procedures, calculating use, application rates, re-entry periods), personal safety (e.g. chemical exposure risks, control measures and maintenance, respirators and filters and PPE), application of chemicals (e.g. selecting appropriate equipment, application technique and calibration, decontamination), record keeping requirements.

Specific training requirements apply for pesticide users / handlers, pest management technicians, fumigators, ground sprayers and aerial applicators. Refer to the NSW Environmental Protection Authority (NSW EPA) for details.

2. Risk management process

Risk management is a systematic process to eliminate or minimise the potential for harm to people.



2.1 Hierarchy of control

The hierarchy of control measures set out in Part 3.1 of the WHS Regulation can be applied in relation to any risk.

The WHS Regulation makes it mandatory for duty holders to work through this hierarchy when managing certain risks. The sections that require the process in Part 3.1 to be followed are set out below.

WHS Regulation reference

Chapter 3 General risk and workplace management, Part 3.2 General workplace management

Division 6 Remote or isolated work, Section 48 Remote or isolated work

Division 8 Hazardous atmospheres, Section 51 Managing risks to health and safety

Division 8 Hazardous atmospheres, Section 52 Ignition sources

Division 10 Falling objects, Section 54 Management of risk of falling objects

Division 11 Psychosocial risks, Section 55C Managing psychosocial risks

Chapter 4 Hazardous work, Part 4.1 Noise

Section 57 Managing risk of hearing loss from noise

Chapter 4 Hazardous work, Part 4.2 Hazardous manual tasks

Section 60 Managing risks to health and safety

Chapter 4 Hazardous work, Part 4.3 Confined spaces

Division 3 Duties of person conducting business or undertaking, Section 66 Managing risks to health and safety

Chapter 4 Hazardous work, Part 4.4 Falls

Section 78 Management of risk of fall

Chapter 4 Hazardous work, Part 4.7 General electrical safety in workplaces and energised electrical work

Division 2 General risk management, Section 147 Risk management

Chapter 4 Hazardous work, Part 4.8 Diving work

Division 3 Managing risks-general diving work, Section 176 Management of risks to health and safety

Chapter 5 Plant and structures, Part 5.1 General duties for plant and structures

Division 7 General duties of a person conducting a business or undertaking involving the management or control of plant, Section 203 Management of risks to health and safety

Division 7 General duties of a person conducting a business or undertaking involving the management or control of plant, Section 214 Powered mobile plant – general control of risk

Chapter 6 Construction work, Part 6.3 Duties of person conducting business or undertaking

Division 1 General, Section 297 Management of risks to health and safety

Division 3 Excavation work, Section 305 Management of risks to health and safety associated with excavation work

Chapter 6 Construction work, Part 6.4 Additional duties of principal contractor

Section 315 Further health and safety duties – specific risks

Chapter 7 Hazardous chemicals, Part 7.1 Hazardous chemicals

Division 5 Control of risk-obligations of persons conducting businesses or undertakings, Section 351 Management of risks to health or safety

Division 9 Pipelines, Section 391 Management of risks to health and safety by pipeline operator

Chapter 8 Asbestos, Part 8.4 Management of naturally occurring asbestos

Section 431 Naturally occurring asbestos

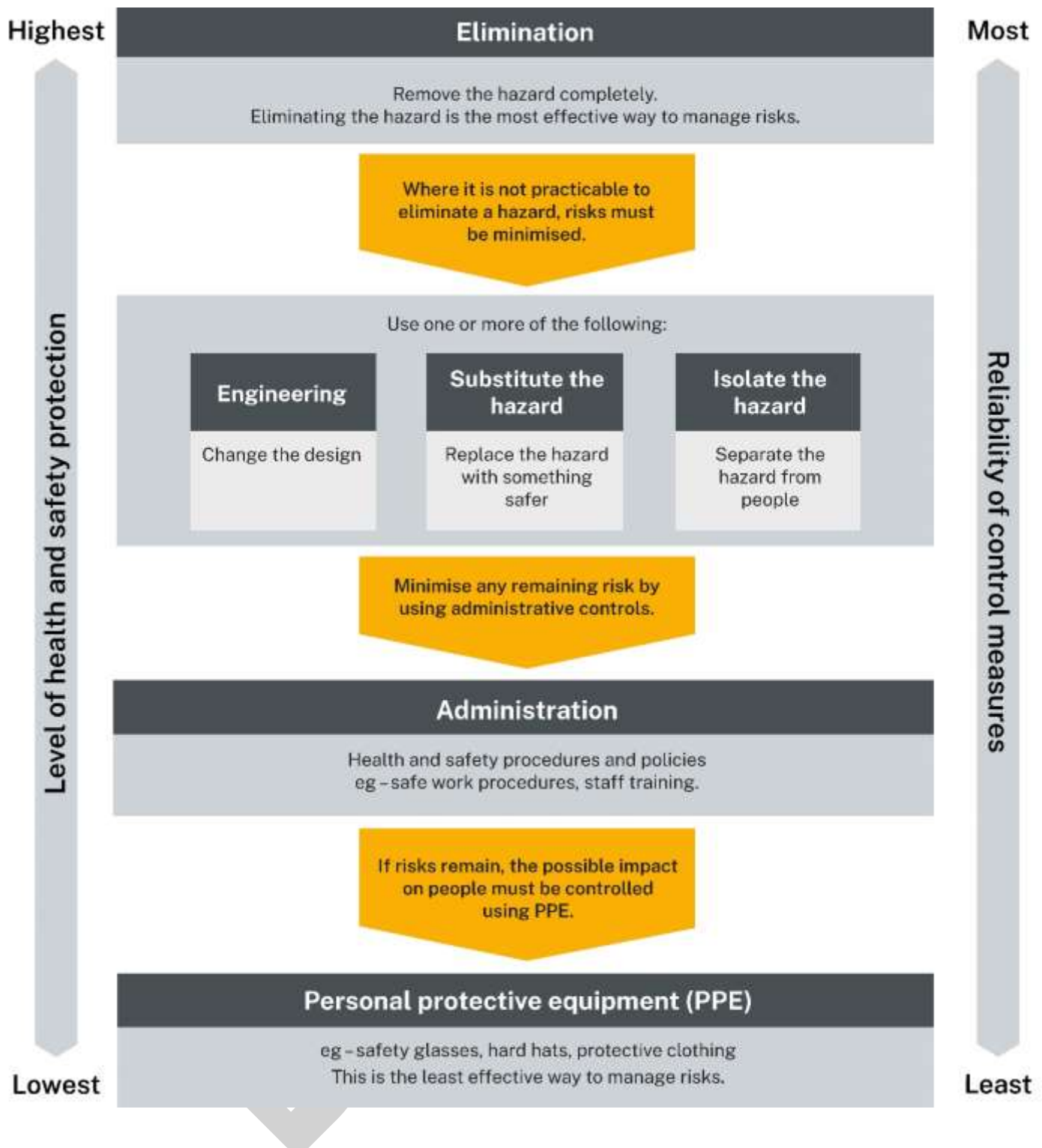


Figure 1: An overview of the hierarchy of control measures

Further risk management guidance is available in the:

- *Code of practice: How to manage work health and safety risks*
- *Code of practice: Managing psychosocial hazards at work*
- *Code of practice: Sexual and gender-based harassment*

3. Conducting the risk assessment

This chapter provides some considerations for applying the risk management process defined in Chapter 2. It is predominately focused on the 'use' aspect, for 'storage' refer to Chapter 9. A step-by-step example checklist to help conduct a risk assessment in Appendix D.

The information is not exhaustive, for detailed information on hazardous chemical labelling and risk management refer to the:

- *Code of practice: Labelling of workplace hazardous chemicals*
 - *Code of practice: Preparation of safety data sheets for hazardous chemicals*
 - *Code of practice: Managing risks of hazardous chemicals in the workplace*
 - *Safe Work Australia's Fact sheet: Understanding safety data sheets for hazardous chemicals.*
-

3.1 Identifying the hazards

Information about hazardous chemicals can be sourced from:

- Labels
 - details will include how to safely use, store and dispose of the hazardous chemical.
- SDS
 - contain critical information beyond the label, such as chemical or hazard identification, ingredients, exposure controls, spill management and personal protection.
- Other sources
 - the pesticide manufacturer, importer, or supplier,
 - stock lists and inventories,
 - maintenance technicians,
 - competent persons with appropriate qualifications and experience,
 - workers,
 - regulators, unions and other organisations,
 - similar businesses or undertakings,
 - Australian, International or other technical standards,
 - APVMA's adverse experience report program data.

This information will assist to determine:

- the degree and type of hazard (e.g. flammability, toxicity, risk of cancer or foetal damage),
- routes of exposure likely during use,
- recommended control measures.

Consider how work is undertaken and the hazardous chemicals used. Some common activities include:

- preparing, mixing or diluting (including handling the concentrate) and loading into equipment,
- applying, such as spraying,
- handling in the storage area,

- loading and handling on vehicles.

Refer to Appendix B for some high-risk activities and their risk factors.

Note: If an APVMA permit has been issued for off-label use, that is, to use a specific chemical for a specific purpose and period of time, the label recommendations may not apply in full. In such cases the APVMA permit conditions must be followed instead. If the recommended controls specified on the label are not being used, steps to adopt off-label conditions need to be taken (see chapter 7).

3.2 Assessing the risks

When assessing the risks associated with agricultural and veterinary chemical use, consider the likelihood of exposure. Factors to assess include:

- The situation, e.g. is the work done in an enclosed space or well-ventilated area?
- The form of the substance, e.g. is it a powder or a vapour? Does its form change with temperature?
- Use of engineering controls, e.g. are ventilation systems or other controls being used correctly?
- Frequency of use, i.e. How often is the chemical used?
- Airborne concentration, i.e. what is the likely concentration in the air in comparison to the exposure standard/limit (WES/WEL)?
- Spray or dust drift, consider factors such as particle size, wind speed and temperature (see Chapter 5).
- Routes of exposure noting chemicals can enter the body through three main routes:
 - Inhalation – breathing in airborne concentrations of a chemical in the form of an aerosol, vapor, mist, or suspended dust. This is a significant route of entry, especially when spraying.
 - Skin contact - many chemicals are readily absorbed through the skin or eyes. This is common when mixing or spraying. Formulations containing solvents and surfactants can increase skin absorption, and high temperatures or humidity can further enhance absorption.
 - Ingestion - swallowing chemicals is usually a minor route of exposure, except in accidents like splashing while mixing or spraying. Ingestion can occur when smoking or eating while handling chemicals. Dusts, vapours, and aerosols can be inhaled and then swallowed.
- The length of time of exposure, including:
 - The length of time a person is in contact with a chemical directly, workers who use a chemical every day will have a much higher potential exposure than workers who use chemicals only occasionally.
 - Contact time and contact area of skin which can be estimated by observing work practices.
- If a general risk assessment is completed for circumstances where the hazard and degree of risk are comparable, ensure:
 - The same chemical, work practices, equipment and materials are used (i.e. applying a particular herbicide to a pasture or jetting sheep).
 - Relevant variable factors, such as weather, are considered.

3.3 Controlling the risks

To control the risks, consider the following.

- Assess the existing control measures in use and compare these with the recommendations on the label and SDS, including the “precautionary statements”.
- If the risk assessment indicates that exposure is, or can be, effectively controlled in accordance with the SDS and product label, it may be concluded that there is no significant risk to health. This generally applies to chemical use when label and SDS directions have been properly followed. Workplace exposures should always be kept as low as reasonably practicable, even where workplace exposure is quantified and workplace exposure standards met.
- Where the risk assessment indicates that there is a significant risk to health select appropriate measures to achieve and sustain control by applying the hierarchy of control, some examples are shown below.
- Consider all instructions provided on the label and SDS when assessing the practicability of control measures.
- Ensure that those control measures are properly applied and maintained.
- Arrange induction and training, especially in areas where the assessment indicates risks are not easily controlled.
- Determine if air monitoring or health monitoring are required, and whether or not it is needed on a regular basis – see Chapters 13 and 14 for more advice.

Applying the hierarchy of control

- **Elimination**, e.g. remove the chemical from the workplace and use nonchemical alternative methods for controlling pests, such as biological control, setting traps, barriers, growing pest-resistant plant varieties.
- **Substitution**, i.e. substitute the chemical for a less hazardous formulation or encapsulated product to reduce handling risks (e.g. using biopesticides, switching from broad-spectrum pesticides to target specific products that reduce harm to non-target species and humans).
- **Engineering controls**, e.g. use extraction ventilation equipment or enclosed cabins with appropriate air filtration in place to remove exposure hazard to workers.
- **Isolation**, e.g. use separate and secured areas used for storing, mixing and preparing pesticides with limited access to all but properly authorised workers. Use closed transfer systems for mixing and loading pesticides.
- **Administrative**, e.g. limiting the time of exposure for a worker, planning outdoor tasks at the most appropriate time of day to minimise wind drift or heat stress.
- **PPE** should only be considered where it is not possible to control exposure by one or more of the above measures.

3.4 Maintaining and reviewing

Control measures must be reviewed and maintained so they remain fit for purpose and suitable for the nature and duration of work. A review is necessary:

- when the control measure is identified as ineffective in managing the risk,
- before implementing a workplace change, that may introduce a new or different health and safety risk,

- upon identifying a new hazard or risk,
 - in response to consultation with workers indicating the need for a review,
 - if a health and safety representative requests a review.
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3.5 Recording control measures

As part of the risk assessment report, records need to be maintained which confirm that exposure to and the storage and handling of hazardous chemicals is being controlled.

Refer to Chapter 15 for detailed record keeping requirements.

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4. Selection, use and maintenance of PPE

PCBUs should ensure that PPE is:

- appropriate for the task – use labels and SDS as a guide, check the supplier's specifications, and seek suppliers' recommendation if needed,
- suitable for the user- this includes ensuring RPE is fit-tested by a competent person,
- readily available, clean, maintained and fully operational,
- worn by the worker in line with training and instruction provided,
- assessed for the likelihood of a secondary injury risk due to wearing PPE, such as skin rash, heat stress or dehydration in hot conditions.

4.1 Eye protection

- Eyes are the most vulnerable parts of the body to chemical or physical damage.
- In any area where there is the possibility of airborne hazards or where chemicals might splash, appropriate eye protection should be worn. This could be in the form of safety glasses, goggles, a face shield, or full-face respirator, as determined by a risk assessment. Splashes are most likely when mixing, pouring and loading application equipment.
- Refer to Australian/New Zealand Standard *AS/NZS 1336:2014 Eye and face protection - Guidelines* for selecting the correct type of eye protection.

4.2 Skin protection

- Skin contact is a major route of pesticide exposure, with chemicals capable of being absorbed through the skin and causing effects ranging from irritation to serious systemic harm. To minimise this risk, workers should wear protective clothing, including long-sleeved coveralls and head coverings, that comply with Australian/New Zealand Standard *AS/NZS 4501.1:2008 Occupational protective clothing, Guidelines on the selection, use, care and maintenance of protective clothing*.
- Hand protection is especially critical, as hands are frequently exposed during mixing, loading, and spraying. Chemically resistant gloves and appropriate splash protection should always be worn during any activity involving hazardous chemicals to prevent skin absorption.
- Gloves should comply with Australian/New Zealand Standard *AS/NZS 2161.1:2016 Occupational protective gloves, Selection, use and maintenance*. Gloves must be properly fitted, regularly inspected, and replaced when damaged or degraded.
- Refer to the SDS for detailed guidance on appropriate skin and hand protection for each of the pesticide.

4.3 Respiratory protection

- In certain situations, respiratory protection is necessary. For example, when working with fine particles, liquids, or gaseous hazardous chemicals and information supplied on the SDS or label requires the use of respiratory protection. Labels may include phrases such as 'avoid inhalation of spray / vapour / dust'.
- Respirators should comply with Australian/New Zealand Standard *AS/NZS 1716:2012 Respiratory protective devices*.

- Refer to Australian/New Zealand Standard AS/NZS 1715:2009 *Selection, use and maintenance of respiratory protective equipment* for use, storage and maintenance requirements.
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4.4 Footwear

- Footwear is an important safety item as it can protect the feet from mechanical and chemical hazards. Footwear with good soles and reliable grip helps to prevent slips and falls. Gumboots are often a practical choice when preparing or applying substances where splashes may occur.
 - In some cases, safety footwear is required. For example, where there is a risk of impact, cuts, or chemical spills occurring. Refer to the SDS for guidance on the appropriate type of footwear.
 - Safety footwear should comply with Australian/New Zealand Standard AS/NZS 2210.1:2025 *Safety and occupational footwear, Guide to selection, care and use*.
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4.5 Hearing protection

- Hearing protection is essential in workplaces with high noise levels to prevent hearing loss and other related health issues.
- Some chemicals used on farms are classified as ototoxic substances or ototoxicants. Ototoxic means “toxic to the ear,” particularly the cochlea or auditory nerve and sometimes the vestibular system, which affects balance. These chemicals can damage the inner ear, potentially leading to hearing loss or balance disorders.
- Ototoxic chemicals can enter the body through inhalation, skin absorption, or ingestion, posing significant risk, especially when combined with loud noise exposure.
- Common agricultural pesticides such as organophosphates, carbamates and pyrethroids are suspected to have ototoxic potential.
- Workplace exposure to both ototoxic chemicals and high noise levels can result in ear poisoning, increasing the risk of hearing loss or balance issues.
- Where exposure to high levels of noise cannot be avoided or prevented through some process of elimination or substitution, appropriate hearing protection equipment must be provided to all persons who may be exposed to the noise.
- Hearing protection should comply with Australian/New Zealand Standard AS/NZS 1270:2002 *Acoustics – Hearing protectors*.
- A PCBU must ensure that audiometric testing is provided for any worker who is frequently required to wear personal hearing protection as a control measure for noise exposure that exceeds the prescribed exposure standard / limit.
- Audiometric testing must be provided within three months of the worker commencing work and regular follow-up tests must be carried out at least every two years.
- Further information can be found in the *Code of practice: Managing noise and preventing hearing loss at work*.

5. Managing spray drift risks

Spray drift refers to the movement of chemical spray droplets away from their intended target areas. Spray drift can occur during application, or shortly thereafter.

5.1 Reducing the risks

- Prepare a plan that identifies areas that may be impacted by spray drift, this includes:
 - houses and farm buildings, neighbouring properties, schools, roads and access points, public places, watercourses and storages, paddocks, livestock, crops, pastures,
 - powerlines and aerial hazards such as transmission towers.
- Use the plan to:
 - communicate to others the factors that need to be considered when spraying,
 - manage spraying operations and give workers directions on working safely and reducing risks to adjoining areas.
- Consult with others (e.g. neighbours):
 - prior to application,
 - about farming activities involving chemical application,
 - chemicals used and potential interactions with others,
 - for agreement on conditions under which application will not proceed or will be abandoned.
- Separate the application site from areas of potential risk using a physical barrier or by maintaining a safe distance. Where this is not practicable, consideration should be given to controlling access to the application area. Wherever possible, a buffer zone should be maintained between sprayed and unsprayed areas.
- Use a formulation or product (if available) that reduces spray drift, or consider an alternative application method, if permitted by the APVMA label. Some formulations are more volatile than others, low-volatility formulations are preferable in areas where there is potential exposure to others nearby or where elevated temperatures may occur after spraying.
Note: Dust can become ionised and remain suspended on dry days, increasing the risk of drift.
- Check wind speed and direction, spraying should only be carried out when the wind is blowing away from areas at risk of drift (see 5.2 Weather conditions).
- Select equipment specifically designed to reduce or eliminate spray drift, if permitted by the label instructions. All equipment should be used, maintained, and calibrated in accordance with the manufacturer's guidelines, and be fit for purpose and appropriate for the task.
- Set up application equipment to maximise efficiency and minimise spray drift. For each type of equipment, variables such as nozzle type, spray pressure, delivery height, and the presence or absence of a directed airstream will affect the size and movement of droplets, and the efficiency to impact the target.
- Control spray volume by changing nozzles rather than varying pressure. Higher pressure typically produces finer droplets, which are more prone to drift.
- Release the spray as close to the target as possible to minimise drift.
- Use non-drip valves and recirculating systems where possible. Ensure pressure gauges are well-maintained and fully functional.

- Calibrate the spray rig accurately and frequently to maintain application precision.
 - Regularly perform calibration, maintenance, and inspections on all equipment and accessories, including nozzles, gauges, regulators, spray output, filters, and ground rigs.
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5.2 Weather conditions

- Monitor weather conditions during and immediately after application. Aerial and ground-based spraying should not be undertaken without access to real-time weather information near the target crop.
- Ideal conditions are relatively high humidity and temperatures within the product's recommended range.
- Temperature affects evaporation rates, especially for water-based sprays. Evaporation can reduce droplet size, making them more prone to drift. Ultra-low volume (ULV) formulations, which use light oil as a carrier, are less susceptible to evaporation.
- High relative humidity helps minimise drift caused by evaporation. Spraying at temperatures above 30°C and relative humidity below 45% increases the risk of drift.
- Spray in crosswind conditions rather than directly into or with the wind.
- Avoid spraying during calm, stable conditions, which often occur early in the morning, late in the afternoon, or during temperature inversions.
- Use advanced spraying equipment, such as rain drop nozzles, which may allow for safer application across a broader range of weather conditions without increasing drift risk.
- Consider rainfall risks, rain can cause pesticide runoff, leading to environmental contamination.
- Do not apply pesticides if rain is likely to wash them away from the application site.

Inversion

- Do not spray during atmospheric temperature inversion conditions, where the air near the ground cools more rapidly than the air above, creating a layer in which temperature increases with altitude instead of decreasing.
- Small spray droplets released into an inversion layer can remain suspended and drift over long distances.
- Inversion conditions are most likely to occur in the early morning or late afternoon when there is little to no wind, and are often indicated by fog, smog, or smoke that drifts at a constant height rather than rising.

5.3 Aerial application

- Aerial application and droplet capture by the target crop are improved when crosswinds create turbulence within the crop canopy.
- Crosswinds between 3 and 10 kilometres per hour are preferable for aerial application over broadacre crops.
- For bare earth or fallow areas, lower crosswind speeds are preferable to minimise drift.
- Spraying should not occur when wind speeds exceed 20 kilometres per hour unless specific drift minimisation strategies are in place.
- Avoid spraying during variable low-speed wind conditions, as they can lead to unpredictable drift patterns.

- If weather conditions are not suitable to minimise drift risk, delay the spray operation until conditions improve.
- Aerial application must only be conducted by appropriately licensed operators.

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6. Minimising chemical waste and disposal

Never dispose of pesticide waste or rinsate down drains, sinks, toilets, gully traps, or into bodies of water.

6.1 Minimising waste

Minimising pesticide use is a key strategy for reducing waste and mitigating potential environmental and health risks. This can be achieved by:

- selecting the most appropriate product available for the intended application,
 - understanding the required quantity needed for the activity, and only purchasing what is needed, coordinating with other commercial users to minimise the total quantity purchased,
 - minimising the number of items used during preparation and application, such as measuring containers, funnels, and stirrers,
 - adding rinsate to the pesticide tank for use, rather than disposing of them separately.
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6.2 Surplus chemicals

Preferred options for disposing of surplus chemicals (in descending order of preference):

- return unopened containers to the supplier or manufacturer,
 - use the chemical for its intended purpose,
 - if the container is sound and the label is intact, offer surplus chemicals to another operator who requires them for an approved use,
 - dispose of waste in accordance with the requirements of the local waste management authority and the NSW EPA. This may include arranging collection by a licensed contractor (e.g. ChemClear) authorised to handle the chemical,
 - label and store surplus chemicals securely while awaiting one of the above disposal options.
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6.3 Proper disposal of empty chemical containers

- Empty containers should be rinsed and either disposed of or recycled in accordance with the instructions provided on the product label / SDS. Prior to disposal, containers should be thoroughly clean to minimise environmental and health risks.
- If rinsing is done manually, containers should be triple rinsed to ensure they are properly cleaned.
- Correct rinsing significantly reduces the environmental impact associated with drum disposal.
- Containers marked as 'returnable' or those with labels specifying return to the point of sale should be returned to the supplier as directed.
- When storing rinsed containers, ensure they are secure and that lids or bungs are removed to prevent reuse.
- If containers are not returned to the supplier, it may be appropriate to puncture or crush them to prevent unauthorised reuse. This step helps eliminate the risk of accidental exposure or misuse.
- Containers should not be burned, as this may cause explosions and release toxic smoke and combustion by-products.

- The decision to accept properly cleaned containers at a landfill location is at the discretion of the landfill operator. Waste holders should consult their local government authority regarding disposal options and requirements.
 - The NSW Department of Primary Industries and the NSW EPA provide detailed guidance on container disposal and recycling. Programs such as “drumMUSTER” offer safe and compliant options for container collection and recycling.
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6.4 Triple rinsing method

- After emptying the container contents into the spray tank, drain the container for an extra 30 seconds after the flow has reduced to drops.
- Fill the container with suitable solvent to about 20-25% of its capacity.
- Replace the cap securely.
- Shake, rotate, roll and/or invert the container to wash all of the inside with solvent.
- Remove the cap and add rinsate from the container to the spray tank.
- Drain the contents for an extra 30 seconds after the flow has reduced to drops.
- Repeat the above steps two more times.
- Check the container thread, cap and thread, and outside surfaces, and if contaminated, rinse with a hose or hand wash.
- Let the container dry completely and replace the cap.

Various rinsing attachments and transfer systems which have flush and rinse cycles are available.

Refer to the NSW EPA’s *Aerial Spraying Facilities Environmental Guidelines* for advice on disposal of waste from aircraft and pad washdown after aerial spraying.

If more than 500kg of hazardous waste is stored, or more than 2 tonnes per year is generated, then a license under the *Waste Avoidance and Resource Recovery Act 2001* is required.

Further information can be obtained from the NSW EPA Department of Environment and Conservation’s pesticide inspectors.

7. Maintaining controls and personal exposure when using chemicals

Ensure that procedures align with the recommendations provided on the label and in the SDS. The following points may be used as an example checklist.

7.1 Clothing and equipment when preparing, mixing, handling and using chemicals

The following items should be considered when preparing, mixing, handling and using chemicals.

- Cotton overalls, buttoned to the neck and wrists.
 - Chemical-resistant, waterproof aprons when mixing or pouring concentrate.
 - Chemical-resistant gloves, preferably gauntlets, when mixing, handling, or using chemicals.
 - A wide-brim, washable hat. If contaminated, the hat should be removed immediately and washed before reuse.
 - Boots, such as rubber or PVC. Waterproof leggings provide additional protection. Avoid leather boots, as they can absorb pesticides and increase exposure during high-volume applications.
 - A face shield or splash-proof goggles when mixing or pouring. When spraying, consider using non-ventilated goggles.
 - An appropriate respirator with a filter, especially if exposure to spray drift is likely.
 - Separate washing facilities should be used when cleaning pesticide-contaminated clothing.
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7.2 Preparing, mixing and handling concentrates and powders

Considerable care should be taken when handling chemical concentrates and powders, as this is the time of greatest risk.

The following precautions to be observed.

- Wear appropriate personal protective clothing and equipment, and ensure an adequate supply of respirator filters, as specified by the product label and SDS.
- Handle and mix concentrates and powders in a well-ventilated area. Always stand upwind while opening, pouring, or mixing to minimise inhalation risk.
- Do not eat, drink, or smoke while preparing and mixing chemical products.
- Prevent contact with the skin, eyes, or mouth. If contamination occurs, immediately wash the affected area with copious amounts of water and refer to the safety directions on the product label / SDS.
- Accurately calculate the required amount of spray volume and calibrate equipment effectively to avoid surplus and minimise waste.
- Triple rinse empty containers during the measuring and mixing process. The rinse water should be added to the spray tank during mixing.
- Clean up spills immediately using appropriate spill kits and follow site-specific spill response procedures,

- Prepare concentrates and powders in the application tank or on a drip tray over an impervious surface, at least 15 metres from any waterway to prevent contamination.
- If the chemical is flammable, decant and prepare it away from any potential ignition or heat sources.

When mixing concentrate chemicals in bulk (using plant or automated machinery), there are key considerations regarding ventilation and static electricity.

- Conduct all mixing in well-ventilated areas, preferably outdoors or in designated mixing zones equipped with mechanical ventilation.
 - Use local exhaust ventilation (LEV) systems to capture vapours at the source.
 - Avoid confined or poorly ventilated spaces where vapours can accumulate and pose inhalation or explosion risks.
 - Use gas detectors or air monitoring devices when working with volatile or toxic substances.
 - Wear respiratory protection if ventilation is inadequate or as specified in the SDS.
 - Consider enclosure design and the use of intrinsically safe electrical components when operating enclosed systems or automated mixing equipment.
- Static electricity control measures:
 - Ensure all containers, tanks, and equipment are properly grounded to prevent static discharge.
 - Use bonding cables when transferring flammable or volatile chemicals between containers.
 - Workers should wear natural fibre clothing (e.g. cotton) under PPE to reduce static buildup and avoid synthetic materials such as fleece.
 - Use anti-static mats, footwear, and gloves where appropriate.
 - Ensure mixing tools and containers are made of non-sparking materials.
 - Keep all ignition sources (e.g. open flames, electrical equipment) away from mixing areas.
 - Follow all SDS instructions regarding ventilation, flammability, and static control.
- Emergency preparedness:
 - Maintain access to spill kits, emergency showers, and eyewash stations in all mixing and handling areas.
 - Ensure emergency procedures are clearly communicated and readily accessible to all personnel.

7.3 Using pesticides

- Use appropriate respiratory protection as recommended on the SDS to prevent inhalation of pesticide vapours or dust.
- Wear protective clothing as recommended on the SDS to prevent skin contamination. If skin contamination occurs, follow the first aid directions on the SDS and/or product label.
- Do not eat, drink or smoke when using pesticides.
- Manage spray drift by carefully assessing wind direction and strength. Never spray in high winds or under inversion conditions, assess weather conditions, and stop spraying if weather conditions deteriorate (see Chapter 5.2).

- Prevent, as far as practicable, pesticide run-off to ensure that adjacent properties, persons, flora, fauna and waterways are not affected.
- Ensure the safety of workers, occupants or users of treated facilities, buildings or areas (e.g. glass houses, grain storage areas).
- Do not blow or suck pipes or nozzles to clear them.
- Anyone feeling ill or developing symptoms should stop work and seek medical attention immediately.

7.4 Washing and equipment clean-up

Regular cleaning and maintenance help prevent the buildup of residues in and on equipment.

After each application:

- remove any remaining pesticide mix from the tank, partially fill the tank with clean water and rinse thoroughly,
- wear PPE during cleaning, and ensure it is cleaned after use,
- remove and wash the suction filter and in-line filters on boom sprays, flush spray lines, and wash nozzles and nozzle filters,
- store pesticide rinsed from the tank in a labelled container for reuse, or spray it over the area just treated,
- flush out and hose down all equipment and machinery used for spraying,
- collect hose down water in a sump or soakaway pit,
- return containers to storage or safely dispose of empty containers after triple rinsing,
- remove and wash protective clothing and equipment,
- wash or shower thoroughly with water and soap, adequate washing amenities, including water, soap, and towels should be provided by PCBU,
- change clothes, and store and wash work clothes separately from other laundry,
- wash vehicles and equipment used to apply pesticides at least 15 metres from any waterway,
- ensure washdown water does not flow into any waterway or area with a high water table.

Refer to the NSW EPA's *Aerial Spraying Facilities Environmental Guidelines* for advice on cleaning and disposing of residues from aircraft and aircraft equipment.

7.5 Use and maintenance of respirators

- A trained person should conduct fit-testing for all workers prior to the first use of RPE, annually and after facial changes. A tight-fitting respirator should be selected based on the fit test results.
- Ensure that the correct type of filter or cartridge is used in the RPE, as specified on the product label and SDS.
- Replace filters and cartridges regularly either as recommended in the SDS or when performance is compromised. Consult the manufacturer or supplier for recommended usage durations relevant to the chemical being used.
- Always check the expiry date on the filter packaging and replace expired items.
- A quick self-performed fit check should be conducted each time the respirator is worn to ensure a secure and comfortable seal.

- Fit check procedures include:
 - Negative pressure check: Place hands over the filter(s) and inhale. A proper seal will cause the facepiece to collapse slightly without air leakage.
 - Positive pressure check: Exhale gently while covering the filter(s) valve. The facepiece should bulge slightly without air escaping.
 - If air enters or escapes, adjust the head straps and repeat the check.
 - A proper seal cannot be achieved if the wearer has a beard or facial hair where the seal contacts the face. In such cases, a powered air-purifying respirator may be required.
 - Facepieces are available in various shapes and sizes. It is essential to select a model / type that provides a satisfactory seal and comfort for the wearer.
- Inspect the facepiece, valves, filters, and hoses regularly to ensure they are in good condition, functioning correctly, and properly maintained hygienically.
- Do not expose the inside of the respirator to pesticides during use or storage.
- After use, remove the filter(s) and wash the facepiece with warm water and soap, and dry thoroughly before storage.
- When not in use, store the respirator and filter(s) in a sealed plastic bag or airtight container in a clean, dry place away from pesticide storage areas. Many respirator filters can absorb other airborne chemicals even when not in use, which shortens their service life.
- Each pesticide user should have their own facepiece. Respirators should not be shared, borrowed, or lent unless they have been properly cleaned and sterilised.

8. Managing transport risks

8.1 Transporting sealed (unopened) chemical containers

Following purchase, when transporting chemicals in their original, sealed (unopened) containers from a supplier, observe the following precautions:

- store containers in a vehicle compartment that is separate from passengers and foodstuffs,
- do not leave the loaded vehicle unlocked or unattended to prevent unauthorised access,
- protect the load from weather exposure (e.g. rain, direct sunlight),
- do not accept or transport containers that are damaged or leaking,
- secure the load to prevent movement during transport and reduce the risk of spills or damaged.

8.2 Transporting chemicals in unsealed (opened) containers

When transporting chemicals after the container has been opened, observe the following precautions:

- store chemicals in a separate airtight compartment, or on the rear section of an open vehicle to minimise exposure and risk of contamination,
- carry PPE, a change of clothes (if contamination occurs), food, and drink in clean containers to prevent contact with any chemicals,
- ensure pest control equipment and chemicals do not come into contact with porous surfaces such as fabric or untreated wood,
- keep all internal and external surfaces of the vehicle, chemical containers, and spray equipment free from chemical contamination,
- protect the load from weather exposure, including rain and direct sunlight,
- do not leave the loaded vehicle unlocked or unattended to prevent unauthorised access,
- do not load containers that are damaged or leaking,
- secure the load to restrict its movement during transport and reduce the risk of spills or damage,
- carry a spill kit for emergency use, suitable for the chemicals being transported, and ensure all personnel are trained in its use.

8.3 Australian Code for the transport of dangerous goods (ADG Code)

The specific requirements of the ADG Code for the transport of dangerous goods generally do not apply to the transport of chemicals within a farm or between properties owned or managed by the same entity, provided the transport is not part of a commercial freight operation.

However, larger farming operations should verify whether the quantity thresholds for dangerous goods are exceeded as this may prompt requirements for vehicle marking, documentation and other compliance obligations under the ADG Code.

Pesticides classified as dangerous goods in Classes 2.3 (toxic gases), 3 (flammable liquids), or 6 (toxic substances) are subject to additional requirements when transported in the following quantities:

- 250 kg or litres of Class 2.3, or Class 3 or 6 in Packing Group (PG) I,
- 1,000 kg or litres of Class 3 or 6 in PG II or III.

If these thresholds are exceeded, operators must seek specific guidance regarding:

- vehicle placarding and marking,
- Transport documentation,
- Driver licensing and training,
- Emergency response equipment.

For further information, consult the ADG Code or contact the NSW EPA or local authority.

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9. Managing storage risks

WHS Regulation section 357 Containing and managing spills

WHS Regulation section 359 Fire protection and firefighting equipment

The purpose of this chapter is to provide advice to minimise emergencies related to chemical storage risks, such as fires, leaks, spills, and accidental exposure.

Accidents and spill risks can occur when opening containers, handling or mixing chemicals, performing maintenance, or due to leaks from gas container or connections (e.g. when opening or closing valves). The risk of exposure or physical harm to anyone nearby may be significant. Environmental risks from escaping chemicals may also be considerable.

These risks can be managed by reducing the likelihood of an incident through safe handling and storage practices, and by establishing emergency procedures to minimise the severity of any incident that does occur.

As part of the risk assessment process, always refer to the SDS for each chemical.

An example site assessment checklist is provided in Appendix D.

The general principles outlined in this chapter should be applied to all types of hazardous chemicals.

9.1 Storage risks

When assessing risks associated with the storage of chemicals, consider the following factors:

- the quantity of chemical to be stored and the type of containers (i.e. packaged or in bulk),
- the duration of storage,
- spillage control measures (for liquids),
- the fire rating of the structure and walls,
- ventilation adequacy,
- emergency procedures and equipment required in the storage area (consult the SDS for guidance on fire and other emergencies),
- placard requirements (see Chapter 10),
- the need to control potential ignition and heat sources,
- separation from other storage areas containing chemicals, fuels, or combustible materials,
- separation distances from buildings, dwellings, food storage areas, workplaces, and accommodation,
- any other factors outlined in the SDS, including relevant Australian Standards that apply to the storage location, design, and separation distances,
- reducing the quantity of chemicals stored by avoiding unnecessary purchases,
- implementing controls to prevent accidental or unauthorised access.

Additional considerations for dangerous goods:

- the dangerous goods class, PG, and other characteristics of the chemicals, such as toxicity, stability, and compatibility (refer to the SDS or supplier),
- the segregation of incompatible classes of dangerous goods. For example, Class 5 oxidising agents (e.g. solid pool chlorine), are incompatible with many other chemicals.

Even when storing small quantities for short periods, appropriate separation distances, spill containment and emergency procedures are essential control measures.

Refer to Safe Work Australia's guidance material *Managing risks of storing chemicals in the workplace* for detailed information on chemical compatibility. For instance, flammable liquids (Class 3) must not be stored with oxidisers (Class 5.1) or corrosive substances (Class 8).

9.2 Storage design (solids or liquids)

When storing chemicals, consider using a secure, dedicated building or a segregated area within a building, with:

- concrete floors that drain into a sump or pit capable of containing chemicals, clean-up materials, and wash water,
- concrete door sills and bunded walls high enough to contain a spillage of either 100% of the largest container or 25% of the total volume of all liquid chemical containers, whichever is greater,
- good natural crossflow ventilation, with vents located in opposite walls above the bund height,
- impervious shelving or spill-control trays on shelving,
- fire and smoke detection systems,
- toxic gas detection systems, where applicable,
- appropriate hazardous chemical signage,
- a lockable door to keep dangerous goods secure, or a child-proof latch if dangerous goods are not stored,
- facilities such as refrigerators and metal cabinets (for flammables or corrosives),
- a spill clean-up kit readily available,
- a supply of, or access to, water for washing and decontamination,
- adequate lighting to ensure labels can be read,
- a location away from flood-prone areas and watercourses,
- provisions to store chemicals at a cool temperature and protect them from moisture, to prevent deterioration of labels and packaging (especially cardboard containers),
- a designated storage area for chemicals if storing more than 100 kg or L, this may be a cabinet, a section of an existing store, or a purpose-built facility.

Note: When two or more tanks are operated as a single unit, use the combined capacity of all tanks for bunding volume calculations.

Refer to the following Australian Standards for detailed guidance:

- *AS 1940:2017 The storage and handling of flammable and combustible liquids*, for bunding volume and flammable storage requirements,
 - *AS 3780:2023 The storage and handling of corrosive substances*,
 - *AS 4326:2008 The storage and handling of oxidizing agents*.
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9.3 Special storage considerations

- Even small amounts of highly toxic chemicals, such as dangerous goods in PG I (e.g. aluminium phosphide), must be stored in a secure metal cabinet with restricted access.

- PG II or III chemicals should be stored on impervious spill trays placed on shelving to contain leaks or spills.
- Certain veterinary chemicals require storage in a dedicated refrigerator, clearly labelled and not used for food or drink.
- If storing more than 1,000 L or 1 tonne of any chemical type, refer to the relevant Australian Standards for bulk storage requirements.
- When storing agricultural and veterinary chemicals that fall under dangerous goods classifications, even in relatively small quantities, refer to Australian Standard AS 2507:2025 *Storage and handling of agricultural and veterinary chemicals* and other relevant Australian Standards for appropriate storage and handling requirements, as below:
 - Class 3 – Flammable liquids:
 - store in AS1940:2017 *The storage and handling of flammable and combustible liquids* compliant flammable liquid cabinets,
 - keep away from ignition sources and direct sunlight,
 - ensure ventilation and spill containment,
 - segregate from oxidisers and incompatible substances.
 - Class 6.1 – Toxic substances:
 - store in lockable cabinets with restricted access and clear hazard signage,
 - emergency equipment (e.g. eyewash, safety shower) should be accessible.
 - Class 8 – Corrosive substances:
 - store in corrosion-resistant cabinets (e.g. polyethylene),
 - avoid metal cabinets,
 - provide secondary containment and adequate ventilation.
 - Class 9 – Miscellaneous Dangerous Goods:
 - storage depends on the specific hazard (e.g. environmentally hazardous such as lithium batteries),
 - follow the SDS and ADG Code for guidance.
 - Minor storage quantities:
 - includes aerosols (UN1950), Class 4.3 substances, and non-dangerous goods such as scheduled poisons,
 - still require secure, labelled, and segregated storage.
- Where a wide variety of packaged dangerous goods are stored (e.g. wineries, oil extraction sites), refer to:
 - Australian/New Zealand Standard AS/NZS 3833:2024 *The storage and handling of mixed classes of dangerous goods, in packages and intermediate bulk containers*,
 - Australian Standard AS 1940:2017 *The Storage and handling of flammable and combustible liquids*.

Above-ground bulk tanks and bunding

Bunding should be designed and constructed in accordance with the relevant Australian Standard applicable to the type of hazardous chemical being stored, and in consultation with the local emergency services authority.

Key bunding requirements for hazardous chemicals in Australia, as outlined in Australian Standard AS 1940:2017 *The Storage and handling of flammable and combustible liquids*, Australian Standard AS 4452:2025 *The storage and handling of toxic substances*, Australian Standard AS 2507:2025 *Storage and handling of agricultural and veterinary chemicals* and NSW EPA guidance, include:

- Indoor tanks:
 - bund must contain 100% of the largest tank.
- Outdoor tanks:
 - bund must contain 110% to allow for rainwater accumulation.
- For flammable and combustible liquids:
 - <10,000 L: Bund capacity must be at least 100% of the largest container plus 25% of the total volume.
 - 10,000–100,000 L: Add 10% of the total volume.
 - >100,000 L: Add 5% of the total volume.
- Construction requirements:
 - Bunds must be impervious, chemically resistant, and fire resistant.
 - They should be designed to allow for the safe recovery of spilled materials.

The net capacity of a bunding should also account for firewater runoff over a 20-minute period.

9.4 Gases

Gas cylinders should be stored:

- securely in an upright position, except for cylinders mounted on vehicles,
- in a well-ventilated area, open on at least two sides,
- in a location secured against unauthorised access, such as a steel mesh enclosure or lockable cage.

Gas tanks should be:

- installed with adequate separation distances from buildings, ignition sources and public areas,
- protected from physical damage and unauthorised access,
- managed in accordance with requirements for ventilation, fire protection, security, and emergency management.

For further information refer to:

- Australian Standard AS 4332:2004 *The storage and handling of gases in cylinders*
 - Australian/New Zealand Standard AS/NZS 1596:2014 *The storage and handling of LP Gas*
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9.5 Storage of packages / storing the chemicals

- Original packaging:
 - chemicals should be stored in their original containers with all labels intact and legible,

- if a container is damaged or leaking, transfer the contents into a correctly labelled replacement container (refer to Chapter 12).
- Container integrity:
 - regularly inspect containers for signs of leakage, corrosion, or damage,
 - leaking or compromised containers should be placed in a secure secondary container (e.g. an over-drum) or removed from service,
 - use older stock before newer stock to minimise waste.
- Sealing:
 - keep all containers tightly closed when not in use to prevent the release of vapours or dust into the storage area.
- Storage practices:
 - do not store liquids above solids to prevent contamination or chemical reactions in the event of a leak,
 - store packages on appropriate shelving or in cupboards designed for chemical storage,
 - do not pressurise containers to transfer contents unless they are specifically designed for that purpose.
- Flammable and combustible liquids:
 - must be stored away from ignition sources such as stoves, heaters, light switches, welders, or other heat-producing equipment,
 - opening or decanting should be done in a well-ventilated area, away from ignition sources and combustible materials,
 - transfer from storage to point of use should be done in a way that minimises the risk of spillage or fire,
 - workers handling these substances must be trained in the associated hazards.
- Incompatibility:
 - store chemicals that may react dangerously if mixed (e.g. pool chlorine and ammonium nitrate fertiliser) separately, in accordance with their SDS.
- Spill management
 - clean up any spills immediately using appropriate materials and dispose of waste in accordance with regulatory requirements.
- Signage:
 - ensure appropriate hazard signage is displayed, including flammable liquid signs, especially where placardable quantities are stored.

For further information refer to:

- Australian Standard AS 1940:2017 *The Storage and handling of flammable and combustible liquids*,
- Australian/New Zealand Standard AS/NZS 2243.10:2004 *Safety in laboratories, Storage of chemicals*,
- Australian Standard AS 3780:2023 *The storage and handling of corrosive substances*,
- *Code of Practice: Managing risks of hazardous chemicals in the workplace*,

- Australian Dangerous Goods (ADG) Code – For classification, packaging, and labelling of dangerous goods.

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10. Additional requirements when storing above certain quantities of hazardous chemicals

WHS Regulation Part 7.1 Division 3 Register and manifest of hazardous chemicals

WHS Regulation Schedule 11 Placard and manifest quantities

WHS Regulation Schedule 12 Manifest requirements

WHS Regulation Schedule 13 Placard requirements

WHS Regulation Schedule 15 Hazardous chemicals at major hazard facilities, and their threshold quantity

When the quantity of hazardous chemicals stored, handled, or used at a workplace exceeds the manifest quantity specified in Schedule 11 of the WHS Regulation, additional regulatory obligations apply.

Hazardous chemicals manifest

A manifest must be prepared and maintained.

It must include details such as the identity, quantity, and location of all Schedule 11 hazardous chemicals, a site plan, and emergency contact information.

The manifest must be readily accessible to emergency services and stored in a location agreed upon with Fire and Rescue NSW (FRNSW).

Notification Requirements

Notify SafeWork NSW and FRNSW via the appropriate online portal when:

- using, storing, or handling Schedule 11 hazardous chemicals above manifest quantities,
- there is a significant change in the quantity, location, or method of storage,
- using or storing such chemicals ceases.

Notifications must include:

- a completed notification form,
- a list of Schedule 11 chemicals by storage area,
- a site plan,
- a copy of the emergency plan.

Emergency Plan

A written emergency plan must be developed and maintained in accordance with section 43 of the WHS Regulation.

The plan must be lodged with FRNSW and include:

- emergency procedures,
- site layout and location of hazardous chemicals,

- emergency contact details,
- an Emergency Services Information Package (ESIP).

The plan must be updated and re-submitted if there are changes to site conditions or chemical storage.

Placarding Requirements

Placards must be displayed:

- at site entries (outer warning placards),
- at the entry to each area where Schedule 11 chemicals are stored (hazard diamonds),

Placards must comply with the specifications in Schedule 13 of the WHS Regulation.

Refer to Appendix F for a copy of Schedule 11.

10.1 Further information on placards and manifests

- SafeWork NSW's *Notifications for Schedule 11 hazardous chemicals and abandoned tanks – Guidance and Placarding for storage of hazardous chemical*
- Safe Work Australia's *Manifest requirements for hazardous chemicals*
- SafeWork NSW's *Placarding for storage of hazardous chemicals*
- Safe Work Australia's *Placard and manifest requirements under the Work Health and Safety Regulations*
- *Code of practice: Managing risks of hazardous chemicals in the workplace*
- *Code of practice: Labelling of workplace hazardous chemicals*
- WHS Regulation Schedule 12 Manifest requirement
- WHS Regulation Schedule 13 Placard requirements

Class specific Australian Standards may also be applicable.

Additional storage requirements

There may also be additional storage requirements for certain types and quantities of hazardous chemicals including LPG, fuels, pesticides, fumigants, ammonium nitrate, poisons and corrosive materials.

For details refer to the *Code of practice: Managing risks of hazardous chemicals in the workplace*.

11. Emergency planning

WHS Regulation section 43

Duty to prepare, maintain and implement emergency plan

WHS Regulation section 361

Emergency plans

Procedures should be developed to address risks such as chemical spills and fires and exposure incidents, and responses such as first aid and firefighting.

Refer to product labels and SDS for specific information on:

- emergency equipment, including the correct type of fire extinguishers,
- emergency shower and eyewash facilities (Australian Standard AS 4775:2007 *Emergency eyewash and shower equipment*),
- emergency response training for workers,
- spill containment and clean-up procedures,
- physical and chemical properties of substances, such as flammability, reactivity and toxicity,
- first aid requirements, including the contents and accessibility of first aid kits.

If hazardous chemicals are stored or handled in quantities exceeding the manifest quantity specified in Schedule 11 of the WHS Regulation (see Appendix F), a written emergency plan is required and must be submitted to Fire and Rescue NSW.

For further details refer to:

- *Code of practice: Managing risks of hazardous chemicals in the workplace* (chapter 6),
- Australian Standard AS 3745:2010 *Planning for emergencies in facilities*.

11.1 Spills

Spill containment

- Provision must be made to manage spills involving chemicals classified as hazardous chemicals.
- Do not store, handle, decant or use hazardous chemicals near open drains or mineral earth / soil unless the drain leads to a sump or interceptor. PCBU's should ensure that hazardous chemicals do not unintentionally leave the site, including through soil. Except where the hazardous chemical is being used intentionally and is designed for use above or on soil.
- To prevent spills, do not use damaged containers or leaking equipment.
- Avoid contaminating the external surfaces of containers or equipment and prevent spills on the ground at loading or mixing sites.
- Use spill trays or bunding to capture leaks and prevent contamination of soil or waterways.

Spill kits and equipment

- Maintain a spill kit at all chemical storage and mixing areas.
- Spill kits should be:

- appropriate to the chemicals stored (e.g. general purpose, oil/fuel, or hazardous chemical kits),
- easily accessible and clearly signed,
- regularly inspected and restocked.
- Spill kits should include:
 - absorbent materials (e.g. lime, sand, vermiculite),
 - PPE (e.g. gloves, goggles, coveralls),
 - waste disposal bags or containers,
 - tools (e.g. broom, shovel),
 - an instruction sheet with emergency contacts.
- Solid fumigants and other Class 4.3 hazardous chemicals are incompatible with water, check the SDS for water compatibility.

Managing spills

- Steps to consider in the event of a spill:
 - stop or control the spill (e.g. shut off valves or pumps),
 - evacuate non-essential personnel from the area,
 - wear appropriate PPE as per the SDS,
 - call for assistance and/or raise the alarm if necessary,
 - move livestock away from the affected area if needed,
 - avoid direct contact with the chemical or fumes,
 - eliminate ignition sources (e.g. open flames, electrical switches,
 - contain the spill using absorbent material or earth if absorbents are unavailable,
 - for powders or dusts (excluding fumigants), lightly wet the material with a fine water spray (if compatible) or cover with plastic sheeting to prevent dust emission,
 - cover the entire spill area with absorbent material and allow time for absorption,
 - collect the absorbed material into a properly labelled container for reuse or disposal,
 - dispose of waste appropriately (see Chapter 6),
 - clean and decontaminate the site using methods recommended by the supplier.
- Dispose of contaminated cleaning solutions in the same manner as hazardous waste.
- If soil is contaminated, remove the top 5 to 10 cm and dispose of it as waste chemicals. Treat the area with hydrated lime, then add a layer of clean soil.
- Anyone involved in the spill response should immediately shower and wash their clothes separately from other laundry as per the SDS. Refer Australian Standard AS 4775:2007 *Emergency eyewash and shower equipment*.
- Decontaminate and clean all firefighting equipment and any remaining materials.
- Check the integrity of any containers exposed to heat or fire. Contact the supplier for advice on chemical stability.

11.2 Fires

Sites should complete regular assessment of the firefighting capability and assets available in the event of an emergency. This may include sprinklers, hydrants, hoses, and extinguishers available, as well as access to water such as tanks and dams. In some cases this may include caging around flammable gas stores.

Consider the following steps when a fire occurs in a chemical store:

- instruct others to stay upwind of the area and not enter the fire zone unless authorised and properly protected,
- a full-face respirator with a self-contained air supply is considered the minimum level of protection for entering the fire area,
- if the fire cannot be quickly extinguished using a dry chemical extinguisher, use the appropriate fire control agent, typically water fog or foam,
- water may be used to cool containers, unless the contents are incompatible with water,
- consider allowing the fire to burn under controlled conditions and limiting its spread.

11.3 Emergency treatment – first aid procedures

Maintain and make easily accessible a suitable first aid kit based on the risk assessment for the nature of the work being undertaken. First aid equipment may include eye pads, eye washes, emergency showers.

Read the SDS and labels prior to using the chemicals and providing emergency first aid treatments.

Consider keeping portable suitable kits in vehicles such as tractors and 4WDs.

General instructions when persons are exposed to chemicals

- Call emergency services immediately if someone is seriously affected.
- Follow the instructions on the chemical label and SDS.
- Use emergency shower and eyewash stations as directed in the SDS. Refer to Australian Standard AS 4775:2007 *Emergency eyewash and shower equipment* for proper use.
- Contact the Poisons Information Centre on 131 126 for expert advice. Have the chemical label or SDS ready.
- If the person is unconscious, do not give anything by mouth or attempt to induce vomiting.
- Begin first aid immediately.
- After first aid, take the person to a doctor or hospital, bringing the chemical container, label, or SDS.
- If unsure, contact a local medical practitioner for advice.

Specific first aid instructions

Always consult the relevant SDS and adhere to the instructions provided for specific first aid instructions for each of the chemicals in use.

Note: For guidance on the safe and effective use of emergency showers and eyewash stations, refer to Australian Standard AS 4775:2007 *Emergency eyewash and shower equipment*.

12. Other considerations

12.1 Decanting

- Decanting should generally be avoided due to the difficulty of maintaining proper identification of the contents in new containers.
- If the entire amount of a decanted hazardous chemical will be used immediately, labelling is not required. Immediate use means:
 - the chemical is not left unattended by the person who decanted it,
 - it is used only by the person who performed the decanting,
 - the container is rendered free of any hazardous chemical immediately after use, as if it had never contained the chemical.
- Otherwise, containers must be properly labelled in accordance with the WHS Regulations and, for AgVet chemicals, the *Agricultural and Veterinary Chemicals Code Act 1994*. The label must:
 - be in English,
 - include the product identifier,
 - include any hazard statement and precautionary statement consistent with the correct classification of the chemical.
- Chemicals should only be decanted into containers designed for chemical use, as some chemicals may react with inappropriate materials.
- Never decant a chemical into a food or beverage container.

For further information on labelling requirements, refer to the *Code of practice: Labelling of workplace hazardous chemicals*.

12.2 Labelling of pesticide application equipment

- Pesticide application equipment, such as small spray tanks, do not require signs or labels if all of the following conditions are met:
 - the equipment contains pesticide that has been prepared or diluted for immediate use,
 - the equipment is under the control of the applicator,
 - there is minimal risk of misuse by others.
- If the diluted pesticide is stored in a tank and not used immediately, it must display a warning sign with at least the following wording:

POISON (followed by the common name of the pesticide)

AVOID CONTACT

HAZARDOUS PESTICIDE
- This requirement applies to tanks mounted on vehicles such as tractors or trucks, but does not apply to portable equipment i.e. knapsack sprayers.
- Any unused diluted pesticide should be disposed of immediately or transferred into a properly labelled container.

12.3 Pesticide containers that are not properly labelled

- Under WHS legislation, all hazardous chemicals must be appropriately labelled. AgVet chemicals under WHS Regulation are exempted from certain labelling requirements. Additionally, under the *Pesticides Act 1999*, pesticides must not be used from containers that do not have a registered label unless the chemical is used immediately and the container cleaned.
- All unlabelled chemical containers should be promptly identified or disposed of.
- If the label is lost but the contents are known, attach a temporary label in accordance with the *Code of Practice: Managing risks of hazardous chemicals in the workplace*.
- If the product name is unknown, label the container as:
CAUTION. DO NOT USE. UNKNOWN SUBSTANCE
- Store the container securely or dispose of it as hazardous waste through a licensed commercial waste contractor, following relevant environmental regulations. Consult the appropriate waste management authority if necessary.

12.4 Re-entry periods

Crops

- The re-entry period refers to the time during which unprotected or unauthorised persons must not enter a treated field following the application of a chemical to a crop. This should be considered as part of the risk assessment.
- Workers and others should be informed of the re-entry period.
- It is especially important to observe the re-entry period when contact between foliage and skin is unavoidable.
- The re-entry period may be specified on the product label.
- If no re-entry period is stated, a minimum of 24 hours should be observed, or until the chemical has dried on the crop, whichever is longer, unless appropriate PPE is provided and worn as intended.
- Exercise caution when entering wet crops that have been treated with chemicals, regardless of the time elapsed since application.
- Even after the re-entry period has passed, PPE may still be required, as indicated on the manufacturer's label and/or determined through a risk assessment.

Silos

- Administrative controls must be implemented to restrict entry into silos to authorised personnel only, particularly following fumigation. Entry should only occur after sufficient time has passed to allow for fumigant dispersal, and only when it is safe to do so.
- Confined space entry procedures must be followed when entering silos, this includes:
 - risk assessment,
 - entry permits,
 - atmospheric testing,
 - emergency planning,

- use of appropriate PPE.
 - Engineering controls, such as forced ventilation, may be required to ensure safe atmospheric conditions before entry.
-

12.5 Exposure to chemical residues

Exposure to residues may occur in the following situations.

- When entering treated crops or pastures where skin contact or inhalation of residues is possible. This includes activities such as crops inspection, pruning, vine training, fruit picking and weed control.
- While handling or packing treated produce such as dipped fruit, cut flowers, nursery plants or livestock. Always observe any label or permit conditions related to post-harvest treatment.
- During mechanical harvesting or bulk transfer, where dusts containing hazardous residues may be generated.
- When fumigants are released during silo transfer which may expose workers to airborne contaminants.

In these situations, a risk assessment should be conducted to determine the need for:

- PPE such as gloves, coveralls, and respirators, based on the chemical's toxicity and exposure route.
- Engineering controls, such as ventilation systems or enclosed cabins for machinery operators.
- Administrative controls, including training, signage, and restricted access to treated areas.

Refer to the SDS and product label for specific PPE and handling instructions.

12.6 Control of risks to other people at or near the workplace

Protecting others from pesticide exposure is essential. The following precautions should be observed.

- Restrict access to areas where pesticides are being sprayed, mixed or applied. This includes keeping children and unauthorised persons away from treated zones during and after application.
- Provide SDS to others at the workplace upon request. This ensures transparency and supports safe handling and emergency preparedness.
- Secure pesticides by keeping them out of reach of children and ensuring that vehicles transporting chemicals are locked or supervised at all times.
- After pesticide application, ensure no residues remain on surfaces or suspended in the air where others could be exposed. Follow label instructions and re-entry intervals as specified.

Prevent spray drift by:

- monitoring weather conditions before and during spraying,
- using appropriate equipment and techniques,
- adhering to buffer zones and label instructions,
- notifying neighbours if there is a risk of drift, especially near sensitive areas such as schools, childcare centres, or health facilities.

13. Workplace exposure standards / limits (WES / WEL) and air monitoring

PCBUs must prevent or minimize hazardous chemicals exposure to workers and others at the workplace as far as is reasonably practicable.

Workplace Exposure Standards (WES)

- Exposure to airborne contaminants must not exceed the relevant Workplace Exposure Standards (WES) listed in Safe Work Australia's *Workplace exposure standards for airborne contaminants*.
- These standards are typically expressed as:
 - Time-Weighted Averages (TWA) – over an 8-hour workday,
 - Short-Term Exposure Limits (STEL) – over a 15-minute period,
 - Peak Limitations – instantaneous maximums.

Transition to Workplace Exposure Limits (WEL)

- From 1 December 2026, Australia will adopt the Workplace Exposure Limits (WEL) list, replacing the WES list.
- The WEL list introduces clearer terminology and updated limits based on contemporary health evidence.
- Until then, PCBUs must continue to comply with the current WES list.

Application and monitoring

- Inhalation is a primary route of chemical exposure, making air monitoring critical.
- Not all chemicals have a listed exposure standard. If one exists, it will be noted in the SDS and may refer to a specific component (e.g. solvent or surfactant).
- Exposure standards are most relevant for workers who regularly and continuously handle chemicals.
- If spraying or other processes generate vapours, aerosols, or airborne particles, it may be reasonable to assume that exposure standards could be exceeded. In such cases:
 - implement control measures such as ventilation, substitution, or PPE (e.g. respirators),
 - follow the hierarchy of controls before relying on PPE alone.

Air monitoring

- If there is uncertainty about exposure levels, PCBUs should conduct air monitoring to measure airborne concentrations and compare them with the applicable standards.
- Air monitoring is especially useful in fixed or indoor environments. Caution is advised in outdoor settings, where weather conditions (e.g. wind, humidity) can affect results.
- Air monitoring should be conducted and interpreted by a qualified occupational hygienist.

14. Health monitoring

Health monitoring refers to the health assessment of a worker's health to identify any changes resulting from exposure to hazardous chemicals. It may include a medical examination and the collection of biological samples such as blood or urine.

Health monitoring is not a control measure and should not be used as a substitute for eliminating or minimising exposure through the hierarchy of controls. Instead, it serves to:

- verify the effectiveness of control measures by confirming that the absorbed dose remains below accepted biological exposure standards (e.g. exposure via use or contact with hazardous residues),
- detect early biological effects that may indicate the need to reduce or cease exposure,
- collect data over time to evaluate the long-term effects of exposure and inform future risk management decisions.

14.1 When is health monitoring required?

PCBUs must provide health monitoring for workers who use, handle, generate, or store hazardous chemicals and there is a significant risk to the worker's health due to exposure.

Schedule 14 chemicals

Health monitoring is mandatory if the chemical is listed in Schedule 14 of the WHS Regulation, which includes:

- Organophosphate pesticides
 - monitoring includes medical history, physical examination and cholinesterase testing (red cell and plasma levels).

Other Hazardous Chemicals

Health monitoring is also required when:

- a significant risk of exposure is identified through a risk assessment, and
- a valid method of biological testing or examination is available.

Examples include:

- herbicides and pesticides containing heavy metals (e.g. arsenic, cadmium, mercury),
- anticoagulant rodenticides (e.g. bromadiolone, brodifacoum),

Effects can be detected by measuring blood clotting ability (INR) and may require Vitamin K1 treatment.

Periodic Health Monitoring

Periodic health monitoring (e.g. baseline, mid-season, end-season testing) should be considered for workers with ongoing or varied exposure to multiple chemicals, such as:

- spraying contractors,
- seasonal agricultural workers,
- pest control operators.

This helps track cumulative exposure and detect early signs of health effects.

14.2 When should health monitoring be undertaken?

Consider undertaking health monitoring in the following situations.

- If a worker shows signs or symptoms of chemical exposure, health monitoring should be arranged immediately or as soon as practicable. Symptoms may result from a single large dose or cumulative exposure over time. In cases of suspected pesticide poisoning, same-day medical assessment is recommended.
 - For workers who frequently handle or are exposed to hazardous chemicals, health monitoring should be conducted at least annually. Timing should align with periods of high exposure, such as spraying season peaks or intensive pesticide use periods. This helps detect early biological effects and verify the effectiveness of control measures.
 - Health monitoring is mandatory when workers are significantly exposed to organophosphate pesticides, which are listed in Schedule 14 of the WHS Regulation (see section 14.6).
-

14.3 Arranging health monitoring

When health monitoring is required, the following steps must be taken to ensure compliance and worker safety:

- Engage a Registered Medical Practitioner
 - Consult a medical practitioner with relevant experience in workplace health monitoring to advise on procedures and oversee the program.
- Consult with Workers
 - Inform workers about the purpose, process, and implications of health monitoring.
 - Ensure they understand their rights and responsibilities.
- Seek Medical Advice
 - Obtain guidance from the medical practitioner on:
 - Appropriate tests and procedures;
 - Recommended frequency of monitoring.
- Prepare Resources
 - Arrange for qualified personnel to collect samples (e.g. blood or urine).
 - Ensure facilities and equipment are suitable for conducting tests.
- Provide Chemical Information
 - Supply the medical practitioner with:
 - A list of hazardous chemicals requiring monitoring;
 - Relevant Safety Data Sheets (SDS);
 - Applicable exposure standards;
 - Risk assessment documentation.
- Facilitate Worker Participation
 - Make practical arrangements to enable workers to attend health monitoring appointments without financial or logistical barriers.
- Cover All Costs

- The PCBU must pay for all expenses related to health monitoring.
- Manage Reports and Notifications
 - Receive health monitoring reports from the medical practitioner.
 - Provide copies to the worker.
 - Notify SafeWork NSW if an adverse health monitoring report is received.
- Maintain Confidential Records
 - Keep health monitoring records secure and confidential.
 - Record key details such as date of monitoring, names of workers involved, any adverse findings.

Refer to guides available on the Safe Work Australia's website:

- *Health monitoring for persons conducting a business or undertaking guide,*
- *Checklist for providing health monitoring,*
- *Health monitoring for registered medical practitioners guide,*
- *Health monitoring when you work with hazardous chemicals guide.*

14.4 Results of health monitoring

Interpretation of health monitoring results is the responsibility of the registered medical practitioner, and their advice on the remedial measures must be consulted with workers and acted upon by the PCBU.

If adverse results are identified:

- the PCBU must review existing control measures to prevent further exposure,
- a copy of the adverse health monitoring report must be provided to SafeWork NSW, as required under the WHS Regulation.

Health monitoring results can help identify instances of excessive exposure. In such cases:

- the associated tasks and work practices must be reviewed,
- control measures must be introduced or revised to prevent recurrence.

Workers who show adverse health effects may require more frequent health monitoring.

Upon termination of work involving organophosphate pesticides, a final medical examination should be conducted to assess any residual health effects.

Refer to Safe Work Australia's *Health monitoring for persons conducting a business or undertaking guide*.

14.5 Organophosphate pesticides

- Organophosphate pesticides are highly toxic and can be readily absorbed through all major routes of exposure, inhalation, ingestion and skin or eye contact.
- They can cause systematic toxicity, that is body organs away from the site of absorption are also affected.
- Exposure to a concentrate or a highly toxic organophosphate pesticide may cause symptoms within minutes of exposure.
 - Skin exposure to a working solution of an organophosphate pesticide may cause adverse effects in an hour.

- A splash in the eye may cause blurred vision due to persistent contraction of the eye muscle.
- Inhalation may cause bronchoconstriction (a decrease in the size of the air passages) and produce an excess of respiratory tract secretions.
- Splashes on the skin may cause localised sweating as well as localised muscle contractions.
- Chronic health effects include:
 - Persistent loss of appetite, weakness and malaise.
 - Certain neurobehavioural effects may rarely occur such as twitching and loss of hand coordination.
 - Many organophosphate pesticides cause primary irritant dermatitis. Some (e.g. parathion and malathion) are known to cause allergic contact dermatitis.

15. Records

WHS Regulation Part 7.1 Division 3 Register and manifest of hazardous chemicals

Maintaining accurate records is essential, particularly in the event of an incident or when a health condition is reported. Comprehensive documentation can demonstrate that appropriate procedures were developed and implemented for the safe storage and use of chemicals in the workplace. This is especially important in relation to long-term (chronic) health effects.

If a worker or another individual sustains an injury due to chemical exposure, the PCBU may be required to provide evidence of the actions taken or the instructions issued regarding the use of chemicals, such as consultation, review of controls and training records.

15.1 Records to be kept

- PCBUs are required to maintain comprehensive records related to hazardous chemical safety, including documentation of training, health monitoring, air monitoring, risk assessments, and a register of hazardous chemicals along with their corresponding SDS. In some cases, manifests and written emergency plans may also be required, refer to Chapter 10 for further guidance.
- Risk assessments for hazardous chemicals should include:
 - identification of significant risks associated with the use of hazardous chemicals and the control measures implemented, including health and air monitoring,
 - coverage of all activities related to chemical storage, including facilities for mixing and disposal, and how associated risks are addressed and controlled,
 - a safe work method statement (SWMS) for the hazardous chemicals used, handled or stored.
- The hazardous chemical register must include:
 - a complete inventory of all chemicals in use,
 - SDS for each chemical.
- Records should be maintained using standardised forms to ensure clarity and ease of completion. Electronic records are acceptable, provided that workers have access to and are trained in their use.
- Additionally, records of pesticide use may be required in relation to NSW Pesticide Regulations. For specific requirements, consult the NSW EPA.

15.2 Content of records

Risk assessment records should clearly document the level of risk and the rationale behind decisions related to:

- the selection, design, construction, or implementation of any control measures used,
- RPE fit testing,
- the selection and use of PPE,
- training arrangements to ensure correct application procedures and proper equipment use,
- consideration of weather conditions, including restrictions on chemical use during unfavourable conditions.

A health monitoring report / record must include key details to ensure compliance:

- the worker's name and date of birth,
- the health monitoring doctor's name, registration number, and signature,
- the business name and address,
- dates of health monitoring.

It should also state whether the worker may have suffered a work-related injury, illness, or disease, and include any recommendations for remedial action, such as whether the worker can continue the work or needs medical counselling or specialist advice.

If hazardous chemicals are involved, the report must also include test results indicating the chemical to which exposure occurred.

The medical practitioner will also maintain a record. These records are confidential and must not be disclosed unless authorised by the worker.

Refer to Safe Work Australia's *Health monitoring for persons conducting a business or undertaking guide*.

15.3 Form of the record

- Select a practical and efficient method for record keeping and avoid unnecessary duplication.
- While up to six forms may be required, some may be combined (examples are provided below).
- On smaller properties with limited workers and chemicals, a simple report attached to the original SDS, or a dated annotation directly on the SDS, may be sufficient. For example, if the SDS for a chemical states "Do not use in a confined space," a note such as "Do not use indoors unless specific ventilation methods are used" added directly to the SDS.
- For larger operations, where the same chemical may be used by multiple groups performing different tasks across various work units, the assessment record should include:
 - a description of the work unit,
 - the name of the assessor or assessment team,
 - names of workers involved in the assessment,
 - the work area, along with the date and time of the assessment,
 - a list of chemicals used within that work unit,
 - a summary of the tasks performed by the work unit,
 - identification of all health and safety risks,
 - conclusions regarding the level of risk,
 - recommendations for control measures and training,
 - the signature of the assessor,
 - the signature of the PCBU.

15.4 Location and access to records

- Records should be stored in a location that is easily accessible to managers, workers, and their representatives.
- Relevant records must be readily available to:

- any worker or other person at the workplace who may be exposed to hazardous chemicals,
 - inspectors from SafeWork NSW,
 - emergency services personnel.
 - A copy of each health monitoring report must be provided to the relevant worker.
 - If a health monitoring report contains adverse findings, a copy must also be submitted to SafeWork NSW.
-

15.5 How long to keep records

- SDS for hazardous chemicals must be retained and kept up to date at the workplace for as long as the chemical remains in use, and for a minimum of five years after its use has ceased.
- Records of risk assessment outcomes and associated actions should be maintained until they are reviewed and updated.
- Records of application procedures should be retained for at least five years, unless health monitoring is required, in which case longer retention periods may apply.
- Health monitoring records must be preserved for a minimum of 30 years, as certain health effects, such as cancers, may take decades to become apparent.
- Records of training provided to workers should be kept for a minimum of five years.

If a business ceases operations and health monitoring records are not transferred to a new owner, these records should be offered to the affected workers and SafeWork NSW for secure storage, in consultation with the registered medical practitioner who conducted the health monitoring.

16. Incident notification

Part 3 of the WHS Act

WHS Act section 35

What is a “notifiable incident”

WHS Act section 38

Duty to notify of notifiable incidents

A ‘notifiable incident’ is:

- the death of a person,
- a ‘serious injury or illness’, or
- a ‘dangerous incident’ that exposes someone to a serious risk (even if no one is injured)

arising out of the conduct of a business or undertaking at a workplace.

‘Notifiable incidents’ may relate to any person — whether an employee, contractor or member of the public.

A PCBU must ensure that SafeWork NSW is notified immediately after becoming aware that a notifiable incident has occurred. Notifications can be made by contacting SafeWork NSW on 13 10 50 or via the SafeWork NSW website: *Notify SafeWork*.

When a PCBU is made aware that a notifiable incident has occurred, the PCBU must:

- report it to SafeWork NSW immediately, and
- preserve the incident site so far as is reasonably practicable until an inspector arrives or directs otherwise. This doesn’t prevent help being provided to an injured person, removing a deceased person, making the site safe to minimise the risk of a further notifiable incident, or to facilitate a police investigation.

Incidents involving multiple businesses or undertakings

If a ‘notifiable incident’ arises out of more than one business or undertaking then each must ensure that the incident has been notified to SafeWork NSW.

There is no need for all duty holders to notify — only one needs to. However, all duty holders retain their responsibility to ensure SafeWork NSW is notified, regardless of any agreement between them.

In these circumstances the duty holders must, so far as is reasonably practicable, consult, cooperate and coordinate to put appropriate reporting and notification arrangements in place.

Examples of these incidents are available in Safe Work Australia’s *Incident notification fact sheet*.

Enforcement action may be taken and penalties may be applied for not notifying notifiable incidents to SafeWork NSW. For more information see the SafeWork NSW website.

17. Appendices

17.1 Appendix A Glossary

Terms used to throughout the Code of Practice that require description.

Term	Description
ADG Code	The Australian Code for the Transport of Dangerous Goods by Road and Rail, as in force or remade from time to time, approved by the Transport and Infrastructure Council. The ADG Code is accessible at the National Transport Commission website (www.ntc.gov.au).
Air monitoring	Measuring the concentration of airborne contaminants to ensure that the contaminants do not exceed the workplace exposure standards/limits. Personal air monitoring is used to measure worker's personal exposure to hazardous substances ensuring compliance with workplace exposure standards/limits
Application	Any method of application of a pesticide by any means including spraying, puddling, gaseous fumigation and the use of baits, foams, gels, granules, powders or fogs, for the purposes of this Code of practice.
Bulk	In relation to a hazardous chemical, means any quantity of a hazardous chemical that is— (a) in a container with a capacity exceeding 500 litres or net mass of more than 500 kilograms, or (b) if the hazardous chemical is a solid — an undivided quantity exceeding 500 kilograms.
Bulkibox	A type of Intermediate Bulk Container (IBC) used for the safe storage and transport of hazardous chemicals and other bulk materials.
Bund	An embankment or wall, which may form part or all of the perimeter of a compound, designed to contain spills of liquid. Note: Both the bund and the compound floor must be sufficiently impervious to retain spillage or leakage.
Chemical	Any chemical or gas, and includes any of the following products: • a pesticide (including a herbicide or fumigant), • a hazardous chemical • a dangerous goods, or • a poison.
Class label	A pictogram described in the ADG Code for a class, or division of a class, of dangerous goods. These labels are used to communicate the hazards associated with chemicals and ensure safe handling, storage and transportation. There are nine classes.

Competent person	A person who has acquired through training, qualification or experience the knowledge and skills to carry out the task.
Confined space	An enclosed or partially enclosed space that — (a) is not designed or intended primarily to be occupied by a person, and (b) is, or is designed or intended to be, at normal atmospheric pressure while any person is in the space, and (c) is or is likely to be a risk to health and safety from — (i) an atmosphere that does not have a safe oxygen level, or (ii) contaminants, including airborne gases, vapours and dusts, that may cause injury from fire or explosion, or (iii) harmful concentrations of any airborne contaminants, or (iv) engulfment, but does not include a mine shaft or the workings of a mine.
Consumer product	A thing that: • is packed or repacked primarily for use by a household consumer or for use in an office • if the thing is packed or repacked primarily for use by a household consumer — is packed in the way and quantity in which it is intended to be used by a household consumer • if the thing is packed or repacked primarily for use in an office — is packed in the way and quantity in which it is intended to be used for office work.
Container	In relation to a hazardous chemical, means anything in or by which a hazardous chemical is, or has been, wholly or partly covered, enclosed or packed, including anything necessary for the container to perform its function as a container.
Contaminant	Any substance that may be harmful to health or safety when present in the workplace. This includes chemicals, dust, fumes, gases, vapours, and micro-organisms.
Dangerous Goods	Has the same meaning as in the ADG Code. Dangerous goods are substances and articles listed in the Australian Dangerous Goods (ADG) Code that have explosive, flammable, toxic, infectious or corrosive properties. They pose a risk to public safety, property or the environment.
Dangerous incident	An incident in relation to a workplace that exposes a worker or any other person to a serious risk to a person's health or safety emanating from an immediate or imminent exposure to — (a) an uncontrolled escape, spillage or leakage of a substance, or (b) an uncontrolled implosion, explosion or fire, or (c) an uncontrolled escape of gas or steam, or (d) an uncontrolled escape of a pressurised substance, or (e) electric shock, or (f) the fall or release from a height of any plant, substance or thing, or

	(g) the collapse, overturning, failure or malfunction of, or damage to, any plant that is required to be authorised for use in accordance with the regulations, or (h) the collapse or partial collapse of a structure, or (i) the collapse or failure of an excavation or of any shoring supporting an excavation, or (j) the inrush of water, mud or gas in workings, in an underground excavation or tunnel, or (k) the interruption of the main system of ventilation in an underground excavation or tunnel, or (l) any other event prescribed by the regulations, but does not include an incident of a prescribed kind.
Decant	To transfer a chemical from a correctly labelled container to another container within a workplace. Decant does not include rebottling or repacking a chemical for supply to another workplace.
Duty holder	Any person who owes a work health and safety duty under the WHS Act including a PCBU, a designer, manufacturer, importer, supplier, installer of products or plant used at work (upstream duty holder), officer or a worker.
Exposure	The condition in which a person comes into contact with a chemical substance in a way that may pose a risk to their health or safety.
Exposure standard / limit	The maximum allowable airborne concentration of a hazardous chemical in the workplace, as specified in the Workplace Exposure Standards for Airborne Contaminants published by Safe Work Australia.
Fumigant	A chemical substance used in a gaseous state to disinfect or control pests, typically within enclosed spaces such as grain silos, shipping containers, or storage facilities. Fumigants may be applied directly as gases or generated from liquids that evaporate or solids that sublime, burn, or chemically react to produce a gas. Note: A certificate of competency is required for the use of fumigants.
Fumigation	The process of applying a pesticide in the gaseous phase, including the use of liquids that evaporate, or solids that sublime, burn or react, to produce a gas. • Fumigation must only be conducted by trained and certified personnel. • Engineering controls (e.g. forced ventilation) and administrative controls (e.g. restricted access) are essential to ensure safe re-entry into treated areas. • Appropriate RPE and monitoring procedures must be in place to prevent overexposure.
Hazard	A situation or thing that has the potential to harm a person. Hazards at work may include: noisy machinery, a moving forklift, chemicals,

	electricity, working at heights, a repetitive job, bullying and violence at the workplace.
Hazardous chemical	A substance, mixture or article that satisfies the criteria for any 1 or more hazard classes in the GHS, including a classification referred to in Schedule 6, unless the only hazard class or classes for which the substance, mixture or article satisfies the criteria are any 1 or more of the following – (a) acute toxicity – oral – category 5, (b) acute toxicity – dermal – category 5, (c) acute toxicity – inhalation – category 5, (d) skin corrosion/irritation – category 3, (e) aspiration hazard – category 2, (f) flammable gas – category 2, (g) acute hazard to the aquatic environment – category 1, 2 or 3, (h) chronic hazard to the aquatic environment – category 1, 2, 3 or 4, (i) hazardous to the ozone layer. Note - Schedule 6 tables replace some tables in the GHS.
Hazardous chemicals register	A list of all hazardous chemicals present in the workplace, accompanied by the current Safety Data Sheet (SDS) for each chemical. The register must be: • Prepared and maintained by the PCBU, • Kept up to date, and • Readily accessible to workers, emergency services, and any other person who may be exposed to the chemicals
Health and safety representative	A worker who has been elected by their work group under the WHS Act to represent them on health and safety matters.
Health monitoring	The systematic assessment of a worker's health to identify any changes that may result from exposure to hazardous substances in the workplace. It is a proactive process designed to detect early signs of adverse health effects so that appropriate interventions can be implemented to prevent further harm.
Herbicide	A type of chemical substance specifically formulated to control, suppress, or eliminate unwanted vegetation, particularly weeds.
Ignition source	Any item, condition, or activity that has the potential to ignite a flammable or combustible substance, leading to fire or explosion. Ignition sources may be electrical, mechanical, chemical, or thermal in nature and are particularly hazardous in environments where flammable gases, vapours, liquids, or dusts are present.
Label	Written, printed or graphical information elements concerning a hazardous chemical that is affixed to, printed on, or attached to the container of a hazardous chemical.
Manifest	A detailed, written summary of specific hazardous chemicals stored, handled, or used at a workplace, required when the quantity of those chemicals exceeds the manifest threshold quantity as defined in Schedule 11 of the Work Health and Safety (WHS) Regulations.

Manifest quantity	The minimum quantity of a hazardous chemical (or group of chemicals) specified in Schedule 11 of the WHS Regulation that, when exceeded at a workplace, triggers additional regulatory obligations.
May	‘May’ indicates an optional course of action.
Must	‘Must’ indicates a legal requirement exists that must be complied with.
Officer	An officer under the WHS Act is: • an officer under section 9 of the <i>Corporations Act 2001</i> (Cth) • an officer of the Crown within the meaning of section 247 of the WHS Act, and • an officer of a public authority within the meaning of section 252 of the WHS Act An elected member of a local authority while acting in that capacity, is not an ‘officer’. A partner in a partnership is also not an officer, as each partner would be considered to be a PCBU.
Organophosphate	A type of organic compound which contains phosphorous, used to control pests. Note: This usually has the words “anti-cholinesterase compound” or “cholinesterase inhibitor” on the label. Organophosphate pesticides are known for their potential toxicity to humans and animals by inhibiting enzymes in the nervous system. Organophosphate pesticides as a group listed under Schedule 14 of WHS Reg requiring health monitoring (see section 14).
Ototoxicant	A substance that can cause damage to the ear, specifically the cochlea or auditory nerve, and sometimes the vestibular system
Package	A container or system used to hold, store, or transport hazardous substances in a form that is sealed or otherwise enclosed. Package is typically used to describe hazardous chemicals that are not in bulk form, such as drums, bottles, or other sealed containers.
Packaged hazardous chemicals	Schedule 11 hazardous chemicals in a container with — (a) a capacity not exceeding 500 litres, or (b) a net mass not exceeding 500 kilograms.
Packing group (PG)	The division of certain classes of dangerous goods into three hazard levels, which help determine the appropriate packaging and handling requirements. These are: • Packing Group I –High hazard (Great danger) • Packing Group II – Moderate hazard (Medium danger) • Packing Group III – Low hazard (Minor danger)
Person conducting a business or undertaking (PCBU)	A PCBU is an umbrella concept which intends to capture all types of working arrangements or relationships. A PCBU includes a:

	• company • unincorporated body or association • sole trader or self-employed person. Individuals who are in a partnership that is conducting a business will individually and collectively be a PCBU. A volunteer association (defined under the WHS Act) or elected members of a local authority will not be a PCBU. <i>Note –</i> A person may be both a PCBU, within the meaning of section 5 of the WHS Act, and a worker within the meaning of section 7 of the WHS Act.
Pest	(a) in relation to an animal, plant or thing – any animal, plant or other biological entity that injuriously affects the physical condition, worth or utility of the first-mentioned animal or plant or of that thing; or (b) in relation to a place – an animal, plant or other biological entity that injuriously affects the use or enjoyment of that place.
Pesticide	A substance as defined by the <i>Pesticides Act 1999</i>, used for controlling pests. This includes: • Herbicides (weed control) • Insecticides • Fungicides • Rodenticides • Bactericides • Repellents • Baits • Fumigants • Ectoparasiticides A pesticide may also be classified as a hazardous substance, dangerous goods, a scheduled poison, and/or a fumigant depending on its properties and use.
Placard	A sign or notice displayed or intended for display in a prominent place, or next to a container or storage area for hazardous chemicals at a workplace, that contains information about the hazardous chemical stored in the container or storage area.
Placard quantity	The quantity referred to in Schedule 11 of the WHS Regulations, table 11.1, column 4 for that hazardous chemical.
Poisons standard	The Standard for the Uniform Scheduling of Medicines and Poisons November 2016 (SUSMP), published by the Commonwealth as in force or remade from time to time.
Psychosocial hazard	A psychosocial hazard is a hazard that —

	(a) arises from, or relates to – (i) the design or management of work, or (ii) a work environment, or (iii) plant at a workplace, or (iv) workplace interactions or behaviours, and (b) may cause psychological harm, whether or not it may also cause physical harm.
Psychosocial risk	A risk to the health or safety of a worker or other person arising from a psychosocial hazard.
Re-entry period	The minimum amount of time that must pass after a chemical (typically a pesticide or fumigant) has been applied to a treated area, such as a crop field or silo, before unprotected or unauthorised persons may enter that area.
Respiratory protective equipment (RPE) fit-testing	A procedure used to determine whether a specific make, model, and size of tight-fitting respirator provides an adequate seal to the wearer's face. It ensures that contaminated air does not leak into the respirator, compromising the wearer's protection.
Retailer	A person whose principal business is supplying consumer products to members of the public who are not engaged in the further supply of those products.
Rinsate	Water that contains low concentrations of contaminants, resulting from the cleaning of containers, equipment, or surfaces that have been in contact with chemicals or hazardous substances.
Risk	The possibility harm (death, injury or illness) might occur when exposed to a hazard.
Safety data sheet (SDS)	A document that describes the identity, properties (chemical and physical properties and health hazard and environmental hazard information), uses, precautions for use, safe handling procedures and safe disposal procedures of a hazardous chemical.
Serious injury or illness	An injury or illness requiring the person to have – (a) immediate treatment as an in-patient in a hospital, or (b) immediate treatment for – (i) the amputation of any part of his or her body, or (ii) a serious head injury, or (iii) a serious eye injury, or (iv) a serious burn, or (v) the separation of his or her skin from an underlying tissue (such as degloving or scalping), or (vi) a spinal injury, or (vii) the loss of a bodily function, or (viii) serious lacerations, or

	(c) medical treatment within 48 hours of exposure to a substance, and includes any other injury or illness prescribed by the regulations but does not include an illness or injury of a prescribed kind.
Should	'Should' indicates a recommended course of action.
Soakaway pit	A buried drainage system designed to manage surface water runoff by allowing it to slowly infiltrate into the surrounding ground.
Spray drift	The movement of chemical spray droplets away from their intended target areas. It can occur during or shortly after spraying.
Substance	A chemical element or compound in its natural state or obtained or generated by a process: - including any additive necessary to preserve the stability of the element or compound and any impurities deriving from the process but - excluding any solvent that may be separated without affecting the stability of the element or compound or changing its composition.
Supplier	A person who conducts a business or undertaking that supplies — (a) plant that is to be used, or could reasonably be expected to be used, as, or at, a workplace, or (b) a substance that is to be used, or could reasonably be expected to be used, at a workplace, or (c) a structure that is to be used, or could reasonably be expected to be used, as, or at, a workplace.
Supply	Selling or transferring ownership or responsibility (for a chemical).
Use	The production, handling, application, storage, transport or disposal of a substance.
Withholding period	The minimum period that must elapse between the last use of a chemical product (such as a pesticide or veterinary medicine) and the harvesting, grazing, slaughtering, or collection of produce (e.g. milk, eggs, wool) from treated crops or animals for human consumption.
Work group	A group of workers established to facilitate the representation of workers by one or more health and safety representatives. A work group may be all workers at a workplace but it may also be appropriate to split a workplace into multiple work groups where workers share similar work conditions or are exposed to similar risks and hazards. For example all workers on night shift.
Worker	Any person who carries out work for a PCBU, including work as an employee, contractor or subcontractor (or their employee), self-employed person, outworker, apprentice or trainee, work experience student, employee of a labour hire company placed with a 'host employer' or a volunteer. <i>Note –</i>

	A person may be both a worker, within the meaning of section 7 of the WHS Act, and a PCBU within the meaning of section 5 of the WHS Act.
Workplace	Any place where work is carried out for a business or undertaking and includes any place where a worker goes, or is likely to be, while at work. This may include offices, factories, shops, construction sites, vehicles, ships, aircraft or other mobile structures on land or water.

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17.2 Appendix B High risk activities and risk factors

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Activity	Risk factors
Mixing and loading spray tanks	• Handling liquids or dust in concentrate form. • Pouring concentrates under conditions where splashes are highly likely.
Aerial spraying	• Incorrect nozzle settings can produce fine droplets that are more likely to drift. • Spray drift affecting nearby homes, schools, farms and natural habitats. • Bystanders exposed to spray mist.
Boom spray	• Filling tanks above head height increases risk of spills if manually performed. • Wind blows spray onto the operator. • Operator is wet from waist down when adjusting nozzles. • Operator blows or sucks blocked nozzles. • Self propelled units with front mounted booms pose a greater inhalation risk.
Blower misters	• Spraying trees poses a particular risk because the foliage canopy creates a tunnel effect. Fine spray mist is easily inhaled and also absorbed through skin of operator. • Fine mist remains in still air for long periods or will drift to neighbouring properties. • High exit velocity from blower can cause widespread contamination.
Knapsack spray tank and other hand held equipment	• Leaking equipment wets back, buttocks and legs of the operator. Hot working conditions increases operator absorption. Incorrect use of handpiece can cause spraying onto feet and legs leading to a high skin absorption rate. • Spraying above shoulder height may cause the operator to be covered by blow back of mist leading to skin exposure plus mist inhaled.
Spraying by wand from tractor supply or ag bike tank	• Feet and legs can be sprayed by mist deflected from plants and the ground. If the pressure is too high, a fine mist will be produced which may blow back on operator. Absorption is via skin and inhalation. Hot working conditions increase skin absorption. • Ag bikes, quad bikes, side by side vehicle can become unstable if overloaded by a spray tank, leading to overturning and spillage.
Fumigation	• Fumigants move into the gaseous phase and are lethal due to the inhalation risk. Consider the risk of residues in area or material fumigated. Examples are the use of fumigants in grain silos or soil fumigation.

Dipping (mobile) and Jetting	• Spray drift (in the case of shower dips). • Dermal exposure. • Timing of application (both seasonal and time of day). • Disposal of rinsate and wastes. • Location of operation (run-off). • Absorption via the skin, especially in hot working conditions.
Hand dressing (eg to prevent fly strike in sheep)	• Dermal exposure. • Timing of application. • Site (e.g. not to be done in the shearing shed). • Inhalation (from aerosols or dust). • Spills, fumes or splashes.
Working in enclosed spaces	• Entry into buildings, where atmospheric contaminants will not disperse quickly. For example, fruit dipping in packing sheds. • Unsafe oxygen levels. • Harmful airborne contaminants (gases, vapours, dusts). • Risk of fire or explosion. • Risk of engulfment (e.g. by grain, sand, or liquids).
Working in confined spaces	• Exhaust fumes from running pumps powered by internal combustion engines creates additional hazards and such engines should not be used in enclosed or confined spaces.
Re-entry of crops after spraying	• Dermal exposure from brushing against foliage – see section 8.5. • Inhalation from aerosols or dust. • Entry by persons before re-entry period.
Welding	• Fumes from welding. The exact hazard depends on the type of welding and the material being welded and the location of the welding, e.g. outdoors, indoors or confined spaces.

17.3 Appendix C Sample chemical storage site assessment record: storage and handling

1. Training

- Has training been provided to all who store the chemicals?
- What type of training?
- Any accredited courses attended?
- Any other certificate/training on reading labels and SDS and storing the chemicals?

2. Storage

- What types of chemicals are held, and what is the maximum amount of these chemicals held at any one time?

Chemical	Dangerous goods class and Sub-risk (if any)	Maximum quantity (kg or L)	SDS held? Y/N

- Is a dangerous goods notification necessary?

Some of the following questions have yes/no answers. Where the answer is “no”, then this should be remedied.

- Are the chemicals properly labelled and have SDS?
- Are the chemicals segregated from incompatible chemicals?
- Are the chemicals separated as per the dangerous goods classes?
- Are the flammable chemicals kept away from the ignition sources?
- Adequate ventilation provided to avoid accumulation of vapours?
- Are waste chemicals and empty containers removed from the chemical storage and disposed off regularly?
- Are the required PPE for handling each chemical at the storage site available?
- Are the SDS held for these chemicals also held in the register (kept elsewhere)?
- How is the chemical store made secure from access by unauthorised persons?
 - locks (necessary if dangerous goods are stored),
 - child-proof gates (if child access is a risk),
 - appropriate signage,

- other (specify).
 - l. How are the chemicals protected from moisture?
 - on pallets,
 - on shelving,
 - other (specify).
 - m. Are herbicides stored away from insecticides and fungicides?
 - n. How are spills controlled in the storage area?
 - impervious and structurally sound bunds with adequate capacity,
 - concrete sill and walls with adequate capacity,
 - trays on shelves,
 - metal cabinet (with in-built bund),
 - other (specify).
 - o. If spills occur, what equipment is available to clean them up?
 - lime,
 - sand,
 - absorbent materials,
 - broom,
 - shovel,
 - appropriate container,
 - clean water for wash up,
 - other (specify) .
 - p. Is the storage area resistant to fire?
 - q. What fire-fighting equipment is available? (as appropriate to chemicals stored)
 - water hose,
 - water bucket,
 - dry powder extinguisher,
 - other extinguisher,
 - hose,
 - other (specify).
 - r. Have employees received training in emergency procedures?
3. Mixing and preparation
- a. Is spillage containment at the mixing site sufficient to contain the contents of the largest container used?
 - b. What personal protective equipment is available when mixing:
 - apron,
 - gloves,
 - face mask,

- goggles,
 - respirator - half / full,
 - overalls,
 - impervious boots,
 - other – specify.
- c. What special safety precautions are taken when mixing chemicals in regard to ventilation, static electricity?
- d. Is mixing carried out with more than one operator present or within shouting distance?
- e. Is water available for personal washing?
4. Disposal
- a. What procedures are used to dispose of chemical containers?
- b. If there is excess chemical, what procedures are used to dispose of it?

17.4 Appendix D Sample risk assessment checklist

Questions	Yes	No
1. Does a risk assessment need to be carried out?		
2. Has it been decided who should carry out the risk assessment?		
3. Have all the hazardous chemicals in the workplace been identified? Has a hazardous chemical register been produced?		
4. Has information about the hazardous chemicals been gathered? (refer to labels, SDS, placards and relevant Australian Standards for the type of hazardous chemical)		
Q. 5–9 should be answered for each hazardous chemical or each process where hazardous chemicals are used in the workplace		
5. Have you checked other records associated with the hazardous chemical? (consider previous assessments, monitoring records, injury or incident records, induction training, task-specific training etc) If 'Yes', are there any hazardous chemical risks previously assessed as 'high' or as 'significant risk'? Specify the risk(s).		
6. Does the chemical have health hazards? (consider potential acute/chronic health effects and likely route of entry)		
7. Does the hazardous chemical have physical hazards?		
8. Does the hazardous chemical have an exposure standard? (refer to the Workplace Exposure Standards for Airborne Contaminants)		
9. Do workers using the hazardous chemical require health monitoring? (refer to Part 7.1, Division 6 and Schedule 14 of the WHS Regulation. If 'Yes', air monitoring may be required.		
10. Are workers, or can workers be potentially, exposed to hazardous chemicals at the workplace, including by-products and waste? For each hazardous chemical or group of hazardous chemicals in the work unit, find out: - Is the substance released or emitted into the work area? - Are persons exposed to the chemical? - How much are the persons exposed to and for how long? Air monitoring may be required to determine exposure. - Are there any risks associated with the storage and transport of the chemical?		
11. Are control measures currently in the workplace well maintained and effective in controlling the hazards? If 'No', take appropriate action.		
12. What are the conclusions about risk? Only answer 'Yes' to one conclusion. - Conclusion 1: Risks are not significant - Conclusion 2: Risks are significant but effectively controlled If you answer Yes to conclusion 1 or 2, go to Q.14. - Conclusion 3: Risks are significant and not adequately controlled - Conclusion 4: Uncertain about risks If you answer 'Yes' to conclusion 3 or 4, go to Q.13.		

Questions	Yes	No
13. Have actions resulting from conclusion about risks been identified? - Seek expert advice - Requires appropriate control measure - Requires induction training - Requires ongoing monitoring - Requires health monitoring - Requires emergency procedures and first aid		
14. Has the assessment been recorded?		

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17.5 Appendix E Sample hazardous chemicals register

Hazardous Chemical Register				
Company		Date last reviewed:		
Worksite:		Contact person:		
Name of Chemical	Issue date of SDS (SDS has an expiry date of 5 years)	Quantity	Location	Comments
Example: Ethanol	19/02/2019	10L	Flammable liquid cabinet, Storage Room 1	Solvent for paints

17.6 Appendix F Placard and manifest quantities

Quantities of hazardous chemicals where placards, manifests and notifications are required.

Description of hazardous chemical		Placard quantity	Manifest quantity
Flammable gases	Category 1A, category 1B or any combination of categories 1A and 1B	200L	5,000L
Gases under pressure	With acute toxicity, categories 1, 2, 3 or 4	50L	500L
	With skin corrosion categories 1A, 1B or 1C	50L	500L
	Not specified elsewhere in this Table	1,000L	10,000L
Flammable liquids	Category 1	50L	500L
	Category 2	250L	2,500L
	Category 3	1,000L	10,000L
	Any combination of chemicals from Items 5 to 7 where none of the items exceeds the quantities in columns 4 or 5 on their own	1,000L	10,000L
	Category 4	10,000L	100,000L
Self-reactive substances	Type A	5kg or 5L	50kg or 50L
	Type B	50kg or 50L	500kg or 500L
	Type C to F	250kg or 250L	2,500kg or 2,500L
Flammable solids	Category 1	250kg	2,500kg
	Category 2	1,000kg	10,000kg
	Any combination of chemicals from Items 11 to 14 where none of the items exceeds the quantities in columns 4 or 5 on their own	1,000kg or 1,000L	10,000kg or 10,000L
Pyrophoric liquids and pyrophoric solids	Category 1	50kg or 50L	500kg or 500L
Self-heating substances and mixtures	Category 1	250kg or 250L	2,500kg or 2,500L
	Category 2	1,000kg or 1,000L	10,000kg or 10,000L
	Any combination of chemicals from Items 16 to 18 where none of the items exceeds the quantities in columns 4 or 5 on their own	1,000kg or 1,000L	10,000kg or 10,000L
Substances which in contact with water emit flammable gas	Category 1	50kg or 50L	500kg or 500L
	Category 2	250kg or 250L	2,500kg or 2,500L
	Category 3	1,000kg or 1,000L	10,000kg or 10,000L
	Any combination of chemicals from Items 20 to 22 where none of the items exceeds the quantities in columns 4 or 5 on their own	1,000kg or 1,000L	10,000kg or 10,000L
Oxidising liquids and oxidising solids	Category 1	50kg or 50L	500kg or 500L
	Category 2	250kg or 250L	2,500kg or 2,500L

	Category 3	1,000kg or 1,000L	10,000kg or 10,000L
	Any combination of chemicals from Items 24 to 26 where none of the items exceeds the quantities in columns 4 or 5 on their own	1,000kg or 1,000L	10,000kg or 10,000L
Organic peroxides	Type A	5kg or 5L	50kg or 50L
	Type B	50kg or 50L	500kg or 500L
	Type C to F	250kg or 250L	2,500kg or 2,500L
	Any combination of chemicals from Items 29 and 30 where none of the items exceeds the quantities in columns 4 or 5 on their own	250kg or 250L	2,500kg or 2,500L
Acute toxicity	Category 1	50kg or 50L	500kg or 500L
	Category 2	250kg or 250L	2,500kg or 2,500L
	Category 3	1,000kg or 1,000L	10,000kg or 10,000L
	Any combination of chemicals from Items 32 to 34 where none of the items exceeds the quantities in columns 4 or 5 on their own	1,000kg or 1,000L	10,000kg or 10,000L
Skin corrosion	Category 1A	50kg or 50L	500kg or 500L
	Category 1B	250kg or 250L	2,500kg or 2,500L
	Category 1C	1,000kg or 1,000L	10,000kg or 10,000L
Corrosive to metals	Category 1	1,000kg or 1,000L	10,000kg or 10,000L
	Any combination of chemicals from Items 36 to 39 where none of the items exceeds the quantities in columns 4 or 5 on their own	1,000kg or 1,000L	10,000kg or 10,000L
Unstable explosives		5kg or 5L	50kg or 50L
Unstable chemicals	Any combination of chemicals from items 10, 28 and 41 where none of the items exceeds the quantities in columns 4 or 5 on their own	5kg or 5L	50kg or 50L
Aerosols	Category 1, category 2, category 3 or any combination of categories 1, 2 and 3	5,000L	10,000L

17.7 Appendix G Risk assessment case study

Case Study: Risk Assessment and Control Measures for Pesticide Decanting Procedure

Background

During a routine inspection of a farming operation, a task was observed involving the decanting and dilution of a pesticide concentrate into a tank mounted on application equipment. The SDS and product label clearly stated that the chemical must not come into contact with skin or eyes nor be inhaled. Mandatory PPE included impervious, chemical-resistant coveralls with a hood, elbow-length gloves, face shield, particulate respirator (complies AS 1716), and chemical-resistant footwear.

Observed Practice

The standard procedure adopted by the worker involved standing on the ground and lifting the container of liquid concentrate above head height to pour it into the tank. This method was chosen for convenience but presented several significant risks:

- Potential for chemical spillage
- Risk of ingestion or inhalation
- Contamination of the worker's clothing and skin.

Risk Assessment Findings

The assessment identified that the current method posed a high risk of exposure to hazardous chemicals. Two safer alternatives were identified:

1. Use of an Access Platform: Climbing onto a properly designed and guarded platform on the rig would allow the worker to pour the concentrate at waist height, significantly reducing the risk of spillage and exposure.
2. Use of a Probe and Pump System: This method would eliminate the need for manual lifting and pouring altogether, thereby reducing both chemical exposure and manual handling risks.

Control Measures and Recommendations

Based on the assessment, the following control measures were implemented:

- **Mandatory PPE:** Workers must wear impervious, chemical-resistant coveralls with a hood, elbow-length gloves, face shield, particulate respirator (complies AS 1716), and chemical-resistant footwear when handling the concentrate.
- **Safe Decanting Methods:** The concentrate must be added to the tank either from the access platform or by using a probe and pump system.
- **Documentation:** These requirements have been documented in the SDS and recorded in the chemical register and other appropriate pesticide usage records as part of the workplace's risk management system.

Conclusion

This case highlights the importance of reviewing routine practices for chemical handling and implementing safer alternatives where feasible. The identified controls are practical, effective, and easily integrated into existing procedures, thereby enhancing worker safety and compliance with WHS regulations.