WORKING WITH HAZARDOUS CHEMICALS AND DANGEROUS GOODS GUIDELINES
Contents

1 Introduction ................................................................................................................................. 4

2 Scope ........................................................................................................................................... 4
  2.1 Hazardous Chemicals versus Dangerous Goods .............................................................. 4

3 Definitions ................................................................................................................................. 5

4 Responsibilities ......................................................................................................................... 7
  4.1 Executive Deans and Directors ......................................................................................... 7
  4.2 Heads of School and Managers of Units ........................................................................... 7
  4.3 Laboratory Managers and Supervisors .......................................................................... 7
  4.4 Workers, Students and Others ...................................................................................... 7

5 Consultation ............................................................................................................................... 7

6 Regulatory Requirements ........................................................................................................ 8
  6.1 Globally Harmonised System of Classification and Labelling of Chemicals (GHS) ....... 8
  6.2 Classification ..................................................................................................................... 8
  6.3 Labelling ........................................................................................................................... 9
  6.4 Safety Data Sheets (SDS) ............................................................................................... 13
  6.5 Hazardous Chemicals Register ....................................................................................... 14
  6.6 Manifest and Placarding Requirements ......................................................................... 14
  6.7 Restricted Hazardous Chemicals ................................................................................... 16
  6.8 Chemicals of Security Concern ....................................................................................... 16
  6.9 Security Sensitive Dangerous Substances ...................................................................... 16
  6.10 Scheduled Drugs and Poisons ....................................................................................... 16

7 Laboratory Safety Inductions .................................................................................................. 17

8 Emergency Response ............................................................................................................... 17

9 Hazardous Waste Disposal ..................................................................................................... 17

10 Purchasing ............................................................................................................................... 18

11 Storage ...................................................................................................................................... 18
  11.1 Storage Cabinets .............................................................................................................. 19
  11.2 Secondary Containment ................................................................................................. 21

12 Transport .................................................................................................................................. 21

13 Risk Management .................................................................................................................... 21
  13.1 Hazard Identification ....................................................................................................... 21
  13.2 Risk Assessment ............................................................................................................. 21
  13.3 Basic Risk Assessment ................................................................................................. 22
  13.4 Hazardous Chemical Risk Assessment (Detailed Risk Assessment) ......................... 23
  13.5 Assessing Risk ............................................................................................................... 23
  13.6 Risk Control Strategies ................................................................................................. 24
  13.7 Monitoring and Review ................................................................................................. 26
<table>
<thead>
<tr>
<th>Section</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>13.8</td>
<td>Risk Control Strategies</td>
<td>27</td>
</tr>
<tr>
<td>14</td>
<td>Health Monitoring</td>
<td>27</td>
</tr>
<tr>
<td>15</td>
<td>Records</td>
<td>27</td>
</tr>
<tr>
<td>15.1</td>
<td>Induction and Training</td>
<td>27</td>
</tr>
<tr>
<td>15.2</td>
<td>Maintenance, Inspections and Repairs</td>
<td>28</td>
</tr>
<tr>
<td>15.3</td>
<td>Records of Risk Assessments</td>
<td>28</td>
</tr>
<tr>
<td>15.4</td>
<td>Documentation</td>
<td>28</td>
</tr>
<tr>
<td>16</td>
<td>Program Evaluation</td>
<td>28</td>
</tr>
<tr>
<td>17</td>
<td>Related Documents</td>
<td>28</td>
</tr>
<tr>
<td>18</td>
<td>Referenced Documents</td>
<td>29</td>
</tr>
<tr>
<td>18.1</td>
<td>Legislation &amp; Codes of Practice</td>
<td>29</td>
</tr>
<tr>
<td>18.2</td>
<td>Australian Standards</td>
<td>29</td>
</tr>
<tr>
<td>18.3</td>
<td>Guidance Material</td>
<td>30</td>
</tr>
<tr>
<td>19</td>
<td>Version Control Table</td>
<td>31</td>
</tr>
<tr>
<td>Appendix 1</td>
<td>Comparison of Hazard Pictograms with ADG Code Class Labels</td>
<td>32</td>
</tr>
<tr>
<td>Appendix 2</td>
<td>Placarding &amp; Manifest Quantities</td>
<td>34</td>
</tr>
</tbody>
</table>
1 Introduction

The University of Wollongong is committed to a safe and healthy workplace for workers, students, contractors and visitors. The object of this guideline, in accordance with legislation, is to manage risks to health and safety that can result from exposure to hazardous chemicals at the University of Wollongong.

2 Scope

This guideline is the University’s program for the safe use, handing, storage, transfer, inventory management and transport of hazardous chemicals and dangerous goods.

This guideline does not apply to the following products if their use is not related to a work activity:

- food
- therapeutic agents
- cosmetics
- tobacco and tobacco products
- toiletries and toilet products
- hazardous chemicals which are used and are in quantities that are consistent with household use.

The guidelines also do not apply to:

- any chemical that only has radioactive hazards i.e. class 7 dangerous goods (refer to the University Radiation Safety Guidelines)
- most class 9 (miscellaneous) dangerous goods
- any infectious substance of biological origin i.e any viable micro-organism, such as a bacterium, virus, rickettsia, parasite, fungus, recombinant, hybrid or mutant, that is known or reasonably believed to cause disease in humans or animals (refer to the University Biosafety Manual).

2.1 Hazardous Chemicals versus Dangerous Goods

Hazardous chemicals are any substance, mixture or article that satisfies the criteria for a hazard class in the Globally Harmonised System of Classification and Labelling of Chemicals (GHS) that are used in the workplace. These can be classified according to their health and physicochemical hazards.

Dangerous goods are substances, mixtures or articles that, because of their physical, chemical (physicochemical) or acute toxicity properties, present an immediate hazard to people, property or the environment. The criteria used to determine whether substances are classified as dangerous goods are contained in the Australian Code for the Transport of Dangerous Goods by Road and Rail (ADG Code).

Substances or articles defined under the ADG Code as class 2, 3, 4, 5, 6.1, 8 or 9, goods too dangerous to be transported (GTDTBT) or C1 combustible liquids meet the definitions of both hazardous chemicals and dangerous goods.
3 Definitions


Bulk Any quantity of hazardous chemical that is:
- in a container with a capacity exceeding 500L or net mass of more than 500kg, or
- if the hazardous chemical is a solid; an undivided quantity exceeding 500kg

Static tanks and transportable containers such as isotainers and intermediate bulk containers (IBCs) are examples of bulk containers (ie tanks) requiring a tank placard for hazardous chemicals at the workplace.

Class The hazard class of the dangerous goods as stated in the ADG Code. A class may include divisions and packing groups (PG).

ChemAlert Online management system for the storage of SDS and stock listings

Combustible C1 – substance having a flashpoint of >60.5°C and <150°C
C2 – substance having a flashpoint of >150°C

The criteria for classifying combustible liquids are contained in Australian Standard AS 1940 (The Storage and Handling of Flammable and Combustible Liquids).

DG Class There are nine classes of dangerous goods:
- Class 1 - Explosives
- Class 2 - Gases (Flammable, Compressed/Non-Toxic, Poisonous)
- Class 3 - Flammable Liquids
- Class 4 - Flammable Solids
- Class 5 - Oxidisers and Organic Peroxides
- Class 6 - Toxic Substances
- Class 7 - Radioactive Substances
- Class 8 - Corrosive Substances
- Class 9 - Miscellaneous Dangerous Goods

DG Diamond Dangerous Goods Class label, often called a “diamond”.

It is possible for substances to display more than one characteristic, therefore these substances will display more than one class label. In those circumstances the substance will have a full primary class label and a subsidiary label which is less prominent than the primary.

EPA Environmental Protection Authority

GHS Globally Harmonised System of Classification and Labelling of Chemicals

Hazard The GHS specifies 9 pictograms, having regard to physical, health and environmental hazards. They provide a graphical representation of the chemical’s hazardous properties.

Pictogram Hazard statements describe the nature of a hazard, including the degree of the hazard. These replace Risk Phrases.

HAZCHEM Code A HAZCHEM Code has been developed to assist emergency services around the world. It is a first response instruction which provides advice on dealing with issues such as a fire or an environmental contamination situation involving dangerous goods.
Label
A set of information on a container which identifies the substance in the container, identifies whether the substance is hazardous and provides basic information about the safe use and handling of the substance.

NOHSC
Approved Criteria for Classifying Hazardous Substances [NOHSC:1008(2004)]. This has been replaced with the introduction of the GHS.

Packaged Hazardous Chemical
A Schedule 11 hazardous chemical in a container with:
- a capacity not exceeding 500L, or
- a net mass not exceeding 500kg.

The term refers to the complete product consisting of the goods and their packaging for transport. Gas cylinders, steel drums, and various bottles and small containers are examples of packages.

PG
To further assist with the identification of dangerous goods and their particular hazards, those of class 3, 4, 5, 6 and 8 are assigned to a packing group (PG) which represents the “level of danger” to persons exposed.
- PG I = great danger
- PG II = medium danger
- PG III = minor danger

Placard
A sign displaying information outlined in Schedule 13 of the WHS Regulation 2011 to communicate information about hazardous chemicals that exceed quantities specified in Schedule 11.

Precautionary Statement
These describe the recommended measures that should be taken to minimise or prevent adverse effects resulting from exposure to, or improper storage or handling or, a hazardous chemical. These replace safety phrases.

Risk Phrase
A phrase that describes the hazards of a substance as referred to in the Code of practice for the labelling of workplace substances. These have been replaced by Hazard Statements with the introduction of the GHS.

SafeWork NSW

Schedule 11
Schedule 11 of the WHS Regulation 2011 which outlines Placard and Manifest Requirements.

SDS
A Safety Data Sheet (SDS) is a document which outlines specific health and safety information about the substance. Information includes:
- whether the substance is classified as hazardous
- chemical aspects of the substance
- first aid advice
- risk controls to prevent injury

Signal Word
These are used to indicate the relative level or severity of a hazard on a label.

SSDS
Security Sensitive Dangerous Substances (SSDS) are any goods prescribed by the regulation as security sensitive dangerous substances, also referred to as explosive precursors.

Safety Phrase
A phrase that describes the procedures for the safe handling or storage of a substance, or the use of personal protective equipment in conjunction with a substance as provided in the Code of Practice for the labelling of workplace substances. These have been replaced by Precautionary Statements with the introduction of the GHS.

UN Number
The United Nations have allocated a four digit UN Number to substances and articles to assist in their identification, e.g. UN 1075 = LP Gas.
4 Responsibilities

4.1 Executive Deans and Directors

Executive Deans and Directors are responsible for ensuring that legislation relating to hazardous chemicals is implemented within their faculty/division and that appropriate support strategies and risk control plans are implemented according to this guideline and the UOW WHSMS.

4.2 Heads of School and Managers of Units

Heads of School and Managers of Units are to implement the requirements of these guidelines within their area of responsibility and review the need for corrective action where applicable.

4.3 Laboratory Managers and Supervisors

Laboratory Managers and Supervisors are required to ensure that work areas comply with these guidelines within their area of responsibility. This includes:

- appropriate use, labelling, storage and disposal of hazardous chemicals
- regular workplace inspections and completion of corrective actions
- ensuring equipment is operated safely and maintained in safe working order
- completion of risk assessments and Safe Work Procedures where the needs is identified
- providing training, including induction training, for the use of hazardous chemicals and assess competency when required
- required Personal Protective Equipment (PPE) is provided, used appropriately and maintained appropriately
- required signage is provided indicating PPE requirements and access restrictions

4.4 Workers, Students and Others

All workers, students and other personnel who are not specified in this section who work with hazardous chemicals are required to work safely and to cooperate with the University and, in relation to the tasks that affect them directly, contribute to the process of identification, assessment and control, and support implementation of the legislation by participation in:

- risk assessment processes
- consultation
- training.

5 Consultation

The University will consult with stakeholders so that they may contribute to decisions about the implementation of radiation safety practices and systems designed to ensure the health, safety and welfare of workers and students. Worker involvement at all levels is critical for ensuring a safe workplace. Further information on the University’s consultative arrangements can be found in the University Consultation Statement.
6 Regulatory Requirements

6.1 Globally Harmonised System of Classification and Labelling of Chemicals (GHS)

The WHS Regulation 2011 covers workplace hazardous chemicals and dangerous goods under a single framework for hazardous chemicals and introduces a new hazard classification and hazard communication system based on the United Nations’ Globally Harmonised System of Classification and Labelling of Chemicals (GHS).

The GHS (known as “The Purple Book”) is a single internationally agreed system of chemical classification and hazard communication through labelling and SDSs which includes harmonised criteria for the classification of physical, health and environmental hazards. This will replace the Approved Criteria for Classifying Hazardous Substances [NOHSC:1008(2004)] (NOHSC).

While the GHS was introduced in the WHS Regulation 2011, transitional arrangements apply in Australia until 1st January 2017 to allow manufacturers and suppliers to apply the new requirements. The GHS has already been adopted by Japan, China, Korea, Malaysia, Taiwan, New Zealand, the EU, Canada and the USA (or currently transitioning).

Upon full implementation of the GHS for use and minor storage, the ADG Code will still apply to the transport and storage of placard quantities of hazardous chemicals in the workplace.

The Hazardous Chemical Information System (HCIS) is a database of information on chemicals that have been classified in accordance with the GHS. HCIS contains GHS classifications and labelling information for over 4,500 chemicals and a searchable database of workplace exposure standards (HCIS replaces the previous Hazardous Substance Information System (HSIS) which was a database of information on substances classified in accordance with NOHSC).

6.2 Classification

If a chemical meets the criteria of the GHS, for one or more class, it is a hazardous chemical. Each hazard class is split into categories, divisions and types which are explained through the new pictograms, signal words and hazard statements (see Classification and Labelling for Workplace Hazardous Chemicals Poster for full table).
6.2.1 Hazard Pictograms

These provide a graphical representation of the chemical’s hazardous properties. There has been a change from displaying Dangerous Goods Diamonds to Hazard Pictograms (see Appendix 1 – Comparison of Hazard Pictograms with ADG Code Class Labels).

Note: the WHS Regulation allows manufacturers and importers to continue to use dangerous goods class labels on containers for workplace hazardous chemicals for transport purposes.

6.2.2 Signal words

Introduction of Signal Words that provide an indication of the relative severity of the hazard:

- **DANGER** - Severe or significant hazard
- **WARNING** - Less severe hazard.

6.2.3 Hazard statements

- Describes the nature and severity of chemical hazard.
- Categorised in relation to physical/health/environmental hazards.
- Change from Risk Phrases.
- Examples:
  - Highly flammable liquid and vapour
  - May cause respiratory irritation
  - May cause cancer
  - Contains gas under pressure
  - Causes severe skin burns and eye damage.

6.2.4 Precautionary statements

- Recommended measures to prevent or minimise risks during storage, handling, use or disposal.
- Categorised into prevention, response, storage and disposal.
- Change from Safety Phrases.
- Examples:
  - Keep away from heat/sparks/open flames/hot surfaces – No smoking
  - Dispose of contents in accordance with local Regulations
  - Do not breath dust/fume/gas/mist/vapours/spray
  - Get immediate medical advice/attention.

6.3 Labelling

Labels are required to be affixed on containers or pipe-work that contain hazardous chemicals. Additionally, non-hazardous chemicals should also be labelled to distinguish them from those that are hazardous.

Labels display information on any hazards associated with the hazardous chemical, plus instructions and information on the safe storage, handling, use and disposal of the chemical. Like an SDS, a label is an important source of information that can be used to control risks during use.
The responsibilities surrounding labelling are identical to safety data sheets in that it is the responsibility of the manufacturer to develop them and for the supplier to provide them when a hazardous chemical is purchased. When a hazardous chemical has been manufactured at the University a label will also need to be developed. It is the responsibility of the person developing the hazardous chemical to ensure that the label has been developed in accordance with Schedule 9 of the WHS Regulation and the Labelling of Workplace Hazardous Chemicals Code of Practice which outlines the minimum standards for labelling.

6.3.1 Labelling of Containers

Correct labelling of containers under GHS includes the following elements:

- the product identifier
- name, Australian address and business telephone number of manufacturer/importer
- identity and proportion of chemical ingredients
- hazard pictogram(s)
- hazard statement(s), signal word and precautionary statement(s)
- other information about hazards, first aid, emergency procedures
- expiry date (if applicable)
- written in English (legibly)

Manufacturers/suppliers must only supply GHS containers with GHS compliant labels from 1st January 2017.

Workplaces in possession of chemical containers displaying NOHSC compliant labels are able to continue using them after 1st January 2017, but it is highly recommended that old stock is used up or disposed of as soon as practicable to avoid confusion.
6.3.2 Special Labelling Requirements

Special labelling requirements may be applied in some circumstances. The Labelling of Workplace Hazardous Chemicals Code of Practice outlines specific guidance for:

- Small containers
- Research chemicals or samples for analysis
- Decanted or transferred chemicals
- Hazardous waste products
- “Internal use” chemicals with known hazards
- Dangerous goods packaged for transport
- Consumer products
- Agricultural or veterinary chemical products
- Products containing nanomaterials

Small containers

Where a hazardous chemical is packaged in a container that is too small to attach a label with information that is required of hazardous chemical labels in general, then the label must include the minimum requirements of:

- Written in English (legibly)
- The product identifier
- Name, Australian address and business telephone number of manufacturer or importer
- Hazard statement OR pictogram
- Any other element that is reasonably practicable to include (priority should be given to elements relating to the most significant hazards)

Research chemicals or samples for analysis

If a hazardous chemical is used for research purposes only or is a sample for analysis, the label must include the minimum requirements of:

- Written in English (legibly)
- The product identifier, which may be the:
  - Actual name of chemical
  - Recognised abbreviation or acronym
  - Chemical formula, structure, or reaction components
- Hazard statement OR pictogram
- The identity of the substance or mixture must be determined
  Where research chemical or sample for analysis cannot be identified this should be indicated clearly on the label.
Decanted or transferred chemicals

If a hazardous chemical has been decanted or transferred from the container in which it was packed and will not be used immediately or it is supplied to someone else, the label must include the minimum requirements of:

- Written in English (legibly)
- The product identifier
- Hazard statement OR pictogram

Where the entire decanted amount will be used immediately, labelling of its container is not required.

Where a container is repeatedly used for decanting the same substance, a permanent label (including ALL Labelling of Containers requirements) must be attached to that container.

Hazardous waste products

If it is reasonably likely that a waste product is a hazardous chemical, then the label on the container of the hazardous waste must include the minimum requirements of:

- Written in English (legibly)
- The product identifier, which should reflect the nature of the waste as closely as possible, eg:
  - Chlorinated solvent waste
  - Flammable waste
  - Heavy metal waste
- Name, Australian address and business telephone number of manufacturer or importer
- Hazard statement OR pictogram

UOW has labels for hazardous, biological, radiological, cytotoxic, toxic, halogenated, non-halogenated, aqueous acidic and aqueous alkaline waste

6.3.3 Labelling of Pipe-Work

Methods for identifying hazardous chemicals in pipe-work may include:

- Markings on the pipe-work (eg colour coding in line with AS 1345)
- Signs adjacent to pipe-work
- Schematic layouts displayed prominently
6.3.4 Non-Hazardous Substances

Where appropriate, non-hazardous substances should be clearly labelled to distinguish them from those that are hazardous and avoid inadvertent and inappropriate use.

6.4 Safety Data Sheets (SDS)

An SDS provides information on the identity of a product and any hazardous ingredients, potential health effects, toxicological properties, physical hazards, safe use, handling and storage emergency procedures, and disposal requirements specific to the chemical. Any hazardous substance that is stored, handled or transported in a University of Wollongong controlled workplace must have an accompanying SDS. The SDS must be referred to when undertaking a risk assessment for the use of a hazardous chemical.

Properties of the SDS must meet the requirements established in the Preparation of Safety Data Sheets for Hazardous Chemicals Code of Practice. When a hazardous chemical has been manufactured at the University an SDS will also need to be developed. It is the responsibility of the local area developing the hazardous chemical to ensure that the SDS has been developed in accordance with the Code.

Although it is the responsibility of the chemical manufacturer to develop an SDS and for the supplier to provide it, the University is responsible for making sure the SDS is available and accessible. If an SDS is not provided by the supplier then the purchaser needs to source it. An SDS can generally be located via a request to the supplier, downloaded from the supplier’s website or on ChemAlert. Adding a Product to ChemAlert Procedure should be followed if the SDS is sourced from the Supplier.

An SDS is to be renewed when the issue date is greater than 5 years old or when the substance or information in the SDS has changed. If the SDS is held within the ChemAlert database, it should be automatically updated every 5 years (so long as that the manufacturer or supplier provides it to ChemAlert when requested). Where an SDS on ChemAlert is identified as not being within 5 years, the user should contact the manufacturer or supplier to obtain and updated version which can be forwarded to ChemAlert for uploading. However if the chemical has been discontinued by the supplier and is still in use, the last SDS shall be retained.

6.4.1 Legislative Requirements for SDSs

- Must be in English
- Contain Australian legal units of measurements
- State the date it was prepared/last reviewed
- State the name, Australian address and business telephone number of the manufacturer/importer
- State an Australian emergency number

<table>
<thead>
<tr>
<th>Contain the following 16 sections:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Identification</td>
</tr>
<tr>
<td>2. Hazard(s) identification</td>
</tr>
<tr>
<td>3. Composition/ingredients</td>
</tr>
<tr>
<td>4. First aid measures</td>
</tr>
<tr>
<td>5. Fire-fighting measures</td>
</tr>
<tr>
<td>6. Accidental release measures</td>
</tr>
<tr>
<td>7. Handling and storage</td>
</tr>
<tr>
<td>8. Exposure controls and personal protection</td>
</tr>
<tr>
<td>9. Physical and chemical properties</td>
</tr>
<tr>
<td>10. Stability and reactivity</td>
</tr>
<tr>
<td>11. Toxicological information</td>
</tr>
<tr>
<td>12. Ecological information</td>
</tr>
<tr>
<td>13. Disposal considerations</td>
</tr>
<tr>
<td>14. Transport information</td>
</tr>
<tr>
<td>15. Regulatory information</td>
</tr>
<tr>
<td>16. Other information</td>
</tr>
</tbody>
</table>
6.5 Hazardous Chemicals Register

The University must keep a register of all hazardous chemicals in accordance with s346 of the WHS Regulation 2017. The register must include:

- List of all hazardous chemicals, including information regarding:
  - product trade name and United Nations number
  - Dangerous Goods Class and Packing Group
  - typical and maximum quantities held and the package sizes and supplier details, and
  - location of storage and point of use.

- The relevant SDS
- Any risk assessments

The register must be readily accessible by:

- A worker involved in using, handling or storing hazardous chemicals
- Anyone else likely to be affected (e.g., emergency services, students)

The University maintains this Hazardous Chemicals Register within Stock Holdings module of ChemAlert.

Each laboratory or work area is required to maintain their stock holdings in ChemAlert to ensure that it accurately reflects what is in the area. ChemAlert should contain information on what is in the area including maximum quantity of a product that could be in the area at any time.

6.6 Manifest and Placarding Requirements

SafeWork NSW is required to be notified for quantities exceeding the manifest quantities as outlined in Schedule 11 (reproduced in Appendix 2 - Placarding & Manifest Quantities). This notification requires a site map to indicate storage locations and quantities, e.g.:

- Underground tank = 45,000 l of diesel at Facilities Management Division compound
- Flammable liquids roofed package store = 8,000 kg at building 31
- Corrosives Cabinet = 250 L and Toxic Substances Cabinet = 100 L in Room 5:34

When emergency services respond to fires and chemical spills at workplace using, storing or handling hazardous chemicals, the responders need to know the potential hazards involved at such incidents. For effective and efficient emergency action, they need information about the type, quantity and locations of the hazardous chemicals stored at the workplace. Placards are a means of alerting the emergency services and other persons to the presence of hazardous chemicals and providing information about them.

All hazardous chemicals exceeding the placarding quantities listed in Schedule 11 (reproduced in Appendix 2 - Placarding & Manifest Quantities) must display signage in line with Schedule 13. To calculate the quantity of hazardous chemicals in packages, the following applies:

- for solids - net mass in kilograms of the goods in the package
- for liquids - net capacity in litres of the package
- for gasses - water capacity (WC) of the package
- all hazardous chemical packages should be assumed to be full.

A placarding report is available for each storage location in ChemAlert.

The WHS Unit will review the manifest requirements to ensure placarding of buildings and manifests are obtained appropriately.
6.6.1 Types of Placards

The types of placards under the WHS Regulation include:

- outer warning placard for the entrance to the workplace
- information placards for hazardous chemicals in bulk (ie tanks and stockpiles)
- information placards for hazardous chemicals in packages

6.6.2 Outer Warning Placards

An outer warning placard, or HAZCHEM sign, is required at the entrance to the workplace when the workplace exceeds the prescribed placarding quantity in Schedule 11 (reproduced in Appendix 2 - Placarding & Manifest Quantities).

6.6.3 Information Placards for Hazardous Chemicals in Bulk

Bulk containers such as tanks used to contain hazardous chemicals are required to have specific information placards which include:

- the proper shipping name
- UN number
- HAZCHEM code
- ADG Code Class label
- subsidiary risk label (if applicable)

6.6.4 Information Placards for Hazardous Chemicals in Packages

Packaged hazardous chemicals are containers of less than 500L or 500kg, eg drums or cylinders. Individual storage areas where hazardous chemicals in packages are kept must display an information placard when the prescribed placarding quantities in Schedule 11 (reproduced in Appendix 2 - Placarding & Manifest Quantities) are exceeded.

6.6.5 Location of Placards

An outer warning placard must be located on every entrance to a workplace where emergency services may enter the workplace so it is clearly visible from normal approaches. This sign is displayed at the main entrances to the University campus(s).

Information placards must be located within the workplace at the relevant storage location so that they are clearly visible from normal approaches. For hazardous chemicals stored in an indoor area, the information placards must be located:

- at the main point of entry to the building where the goods are stored
- either at every entry to a room or area where the goods are stored or adjacent to them.

For hazardous chemicals stored in an outdoor area, the placard must be located either adjacent to them, or when storage is a tank, on the external surface of the tank or adjacent to the tank.

6.6.6 Other signage

Where a laboratory has a quantity of substances, but with no more than a few litres or kilos in any one class, it is not necessary to notify SafeWork NSW. However, it is recommended that the laboratory be marked on a map for internal use as being a facility that holds a quantity of substances. A Hazard Identification Sign must be displayed upon the laboratory doors (use the Hazard Identification Sign Order Form if required).
6.7 Restricted Hazardous Chemicals

Restricted chemicals are those which prohibit or restrict the use of certain hazardous chemicals or situations. Restricted hazardous chemicals are listed in Appendix C of the Managing Risks of Hazardous Chemicals in the Workplace Code of Practice. Hazardous chemicals which are prohibited carcinogens are listed in the Carcinogenic Chemicals Guidelines.

6.8 Chemicals of Security Concern

The University is committed to meeting the standards developed by the Council of Australian Government that are illustrated in the National Code of Practice for Chemicals of Security Concern. The code of practice is to promote effective chemical security management practices throughout the chemical supply chain, and in particular to protect against the diversion of chemicals for terrorist or criminal purposes.

Units are encouraged to facilitate risk management practices within local areas that aim to identify security gaps and apply new or enhance existing control measures to protect against loss and diversion of chemicals.

Risk management activities are to be completed in accordance with the WHS Risk Management Guidelines. Security topics surrounding the storage, transport and/or handling of chemicals of security concern including employee and contractor checking, personnel security awareness, inventory control measures, purchasing processes, theft and diversion procedures, physical access, personnel access and transportation should be evaluated throughout the risk management process.

During instances where Chemicals of Security Concern are suspected of being lost, stolen or misused please contact the Manager Security, Manager WHS and Supervisor immediately.”

Further information is available from the Australian Government Department of Home Affairs Chemicals of Security Concern website.

6.9 Security Sensitive Dangerous Substances

As per the NSW legislation, a licence is required to possess and store explosives and/or security sensitive dangerous substances (SSDS). Under the new legislation, fertilizers and other ammonium nitrate products that contain more than 45 per cent ammonium nitrate are designated SSDS, and their access and use is restricted. Those wishing to obtain a licence must satisfy a police and commonwealth agencies national probity assessment.

It is now illegal to possess Security Sensitive Ammonium Nitrate (SSAN, includes any emulsion, gel, suspension or mixture with greater than 45% ammonium nitrate) without a licence. Exemptions are made for quantities less than 3kg which are being used for educational or research purposes at a school, university or research institution.

There are a number of controls to be implemented for these types of substances. Further detail can be found in the Security Plan for Storage and Handling of Explosives from SafeWork NSW.

6.10 Scheduled Drugs and Poisons

Please refer to the UOW Scheduled Drugs and Poisons Procedure.
7 Laboratory Safety Inductions

Any person entering laboratory facilities must comply with the local area’s processes surrounding induction. It is recommended that a local Laboratory Safety Induction Manual/Checklist is developed to ensure consistent information of the relevant local hazards is communicated during each induction.

The level and detail of the safety induction training should depend upon the risk associated with processes carried out and the materials and equipment stored within the on the lab, however minimum induction topics include:

- purchasing process
- chemical labelling requirements
- hazardous chemical storage
- waste disposal
- local emergency equipment and procedures,
- confirmation that the information provided has been received and understood (e.g. quiz).

The induction content should be reviewed annually (at a minimum). More frequent reviews may be conducted when the hazards in the area change or following an incident.

Training records (e.g. completed quiz) must be kept and maintained in accordance with WHS Records Handling Guidelines.

8 Emergency Response

Manifest and Placarding Requirements assist emergency services to respond to any incidents by notifying them of the type, quantity, and locations of hazardous chemicals on site.

Incidents including hazardous chemicals and dangerous goods should be managed according to the Campus Emergency Response Procedures and the Incident Management and Reporting Guidelines.

The need for fire protection and the appropriate fire protection system should be determined by a risk assessment. The “fire protection system” includes fire detection, fire suppression and firefighting equipment, which may be fixed or portable. The risk assessment should take into account the types and quantities of hazardous chemicals and other material and substances and how they are stored and handled. Additionally, the risk assessment should consider the types and quantities of hazardous chemicals and other materials and substances in the area and the types of incidents these could potentially cause. The fire protection system should be installed, tested and maintained in accordance with legislative requirements.

Spill containment should be provided to hold the spill of the largest package. This may be in the form of secondary packaging, temporary or permanent bunding, or draining into an underground sump or tank. Any area or receptacle intended to contain spills or leaks must not be shared with any other substances, including other hazardous chemicals that are not compatible with the hazardous chemicals to be contained.

Ensure spillage controls are in place to prevent or limit environmental contamination, and that ventilation is adequate for storage, handling and draining. This may require a ventilation survey.

9 Hazardous Waste Disposal

10 Purchasing

Every effort should be made to ensure that the quantities of chemicals to be stored are kept to a minimum, in accordance with daily needs and risk. To prevent duplicate purchases, stock holdings in ChemAlert should be checked prior to purchasing to see if the product is already available in the work area or elsewhere within the University.

Purchasing hazardous chemicals needs to be in accordance with the University’s WHS Purchasing Guidelines and a Basic Risk Assessment or Hazardous Chemical Risk Assessment (Detailed Risk Assessment). For green and amber hazardous chemicals, the information contained in the SDS shall be the default basic risk assessment and control plan for safe use. Red chemicals require a detailed risk assessment to be completed.

If the hazardous chemical will be used in a way that is not within the scope of the SDS and the risk cannot be controlled in accordance with the information outlined in the SDS then a detailed risk assessment will be required to be completed. If the hazardous chemical will be used within the scope of the SDS then no further risk assessment is required to be completed as long as the provisions in the SDS are adhered to.

Hazardous Chemical Risk Assessment (Detailed Risk Assessment) is to be completed prior to purchase as required.

11 Storage

Each unit is responsible for the safe storage of all hazardous chemicals and dangerous goods in their workplace in line with regulatory requirements, requirements listed on the SDS and Australian Standards. This applies to all storage locations including laboratories, chemical stores, shared storage areas and workshops.

Hazardous chemicals in bulk must be stored appropriately so that the container, associated pipe work and transfer systems are in good condition. Where the need is identified this may include inspection and maintenance to occur on items that may include but not limited to:

- stable foundations and supports
- installation is free from excessive stress and forces
- protected from deterioration.

Hazardous chemicals stored in packages must be:

- closed when not in use
- stored on surfaces which will not deteriorate if the package is damaged resulting in a spill
- stored in such a way to minimise the risk of falling, and
- positioned in such a way so that leakage will not affect other hazardous chemicals.

Containers, pipe work and attachments holding DG are to be protected from physical damage which may include impacts, imposed loads and mechanical stress.

AS/NZS 3833 The Storage and Handling of Mixed Classes of Dangerous Goods in Packages and Intermediate Bulk Containers outlines requirements for the separation of, and segregation within, stores containing more than one class of dangerous goods, in quantities exceeding those given for minor storage.

Generally, explosives (Class 1) and radioactive substances (Class 7) are incompatible with everything and substances within the same class SHOULD be compatible (check for 5.1 oxidising agents and 8 corrosives). ChemAlert’s Dangerous Goods Storage Compatibility Guide provides information on separation and segregation requirements.
Inspection of storage areas should be undertaken and documented in line with the Workplace Safety Inspection Guidelines and related Checklists.

11.1 Storage Cabinets

Storage cabinets for dangerous goods must comply with the relevant Australian Standard. A brief summary of standards for some types of cabinets is listed on the next page. The full standard should be consulted.
## Storage Cabinets

<table>
<thead>
<tr>
<th>DG Class</th>
<th>Doors</th>
<th>Lock</th>
<th>Clearance</th>
<th>Inner-Base Bunding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class 3 Flammable liquids</td>
<td>Self-closing &amp; close-fitting</td>
<td>Held shut automatically by catches at 2 or more points</td>
<td>Minimum 3m laterally &amp; 1m vertically (ignition)</td>
<td>Liquid-tight compound, at least 150mm deep, designed to prevent the compound from being used as a storage space</td>
</tr>
<tr>
<td>(AS 1940)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Class 5.1 Oxidising agents</td>
<td>Self-closing &amp; close-fitting</td>
<td>Held shut by catches that release in the event of a build-up of pressure within the cabinet</td>
<td>Minimum 3m (heat)</td>
<td>Liquid-tight compound, at least 150mm deep, capable of containing at least 25% of the total storage capacity</td>
</tr>
<tr>
<td>(AS 4326)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Class 5.2 Organic peroxides</td>
<td>Self-closing &amp; close-fitting</td>
<td>Held shut by non-plastic catches that release in the event of a build-up of pressure within the cabinet</td>
<td>Minimum 3m (ignition)</td>
<td>Liquid-tight compound, at least 150mm deep, designed to prevent the compound from being used as a storage space</td>
</tr>
<tr>
<td>(AS 2714)</td>
<td>with non-plastic hinges</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Class 6.1 Toxic substances</td>
<td>Self-closing &amp; close-fitting</td>
<td>Lockable</td>
<td>N/A</td>
<td>Liquid-tight compound, at least 150mm deep, capable of containing at least 25% of the total storage capacity</td>
</tr>
<tr>
<td>(AS 4452)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Class 8 Corrosive substances</td>
<td>Self-closing &amp; close-fitting</td>
<td>Held shut by catches at no fewer than two points</td>
<td>N/A</td>
<td>Liquid-tight compound, at least 150mm deep, capable of containing at least 25% of the total storage capacity</td>
</tr>
<tr>
<td>(AS 3780)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**These points (and others eg ventilation) are to be checked during Workplace Inspections**
11.2 Secondary Containment

Areas where hazardous chemicals are used and stored should include secondary containment to capture the maximum possible spill. This can be in the form of permanent or temporary bunding, spill trays, secondary containers, etc.

12 Transport

A risk assessment must be performed when hazardous chemicals and dangerous goods are to be transported. Dangerous goods during transport are subject to the ADG Code. Dangerous goods transported by air must be packaged by a licences dangerous goods handler.

Minor transport of hazardous chemicals and dangerous goods for purposes such as fieldwork, must comply with the relevant guidelines and SDS including segregation from food stuffs, and as appropriate labelling and signage. Hazardous chemicals and dangerous goods should not be transported within the cabin of the vehicle.

13 Risk Management

13.1 Hazard Identification

It is necessary to identify those hazardous chemicals and hazardous chemicals at the workplace together with any foreseeable hazards arising from the use, storage and handling of the product. This can occur through risk management processes as per the WHS Risk Management Guidelines.

This identification may include a stocktake to establish:

- what items are stored
- the method of storage
- transport
- how it is handled and used
- who is in control
- substance compatibility and separation
- hazardous areas that is within, or arises from storage or handling.

Information regarding a hazardous chemical will be available from the SDS.

13.2 Risk Assessment

Any risk associated with the storage, use and handling of hazardous chemicals must be managed in accordance with the UOW Risk Management Guidelines. If a chemical is classified as hazardous, a risk assessment will need to be completed in order to manage risks. This process is described in more detail in this section.

A risk assessment is the best method to determine the measures that should be implemented to control risks associated with the storage, use or handling of a hazardous chemical. The risk assessment will help:

- identify which workers are at risk of exposure
- determine what sources and processes are causing that risk
- identify if and what kind of control measures should be implemented
- check the effectiveness of existing control measures.
Reviewing the relevant SDS and label will assist with the completion of the risk assessment process.

13.3 Basic Risk Assessment

In order to determine the level of risk associated with any chemical, a basic risk assessment is to be performed using information contained in the SDS, product label as well as ChemAlert or other information based on the intended use of the chemical as well as the risk control measures. This basic risk assessment does not need to be documented.

To assist in the identification of how dangerous a hazardous chemical is the ChemAlert register classifies chemicals according to the associated hazards and the potential risk of exposure:

- **green** - a low risk substance
- **amber** - a moderate risk associated with the use of the substance, and
- **red** - a high risk associated with the use of the substance.

For green and amber hazardous chemicals, the information contained in the SDS shall be the default basic risk assessment and control plan for safe use. Red chemicals require a detailed risk assessment to be completed.

If the hazardous chemical will be used in a way that is not within the scope of the SDS and the risk cannot be controlled in accordance with the information outlined in the SDS then a detailed risk assessment will be required to be completed. If the hazardous chemical will be used within the scope of the SDS then no further risk assessment is required to be completed as long as the provisions in the SDS are adhered to.
13.4 Hazardous Chemical Risk Assessment (Detailed Risk Assessment)

If the basic risk assessment identifies that the substance cannot be controlled as outlined in the SDS or if the substance is rated red in ChemAlert, then a detailed risk assessment is required to be completed. SafetyNet should be used to complete the detailed risk assessment process. The risk assessment should include the risk of purchasing (if this is not a repeat purchase), storing, using and disposing of the substance.

This overall aim of the hazardous chemicals risk assessment is to identify hazards that are not detailed in the SDS for the chemical, prioritise the hazards by assessing the associated risk and control them to eliminate the risk or contain it to an acceptable level. If a hazardous chemical is used across different areas for the same purposes and the nature of the risk is comparable, then one generic detailed risk assessment may be used for the different areas.

Hazardous Chemical Risk Assessments can be completed by any person with sufficient knowledge and skills to evaluate the health risks to employees arising from operations involving the use of the hazardous chemicals. Training courses in risk management and hazardous chemicals are offered by the University through the training calendar and are recommended to ensure that hazardous substance risk assessments are conducted appropriately.

A Hazardous Chemical Risk Assessment may also be necessary where either of the following apply:

- there is uncertainty about the degree of risk
- there is a significant risk to health, for example, exposure to a hazardous substance may be high and/or the nature of the health hazard is serous (this is particularly relevant for a listed carcinogen or a substance containing a listed carcinogen)
- more complex chemical processes and/or exposures are involved.

Specialist knowledge may be needed to complete the assessment e.g. occupational hygienist for air or ventilation/engineering advice or a toxicologist. The WHS Unit can be contacted to provide contact details or arrange for specialists.

The hazardous substance risk assessment form needs to be used to determine if Health Monitoring is required for a particular hazardous chemical.

13.5 Assessing Risk

When assessing health and safety risks associated with the storage, use or handling of a hazardous chemical the following points should be considered:

- the routes of entry by which the chemical can affect a person’s health
- the physical form and concentration
- the chemical and physical properties of the substance
- determining who could be exposed and when this could occur
- how often is exposure likely to occur and for how long
- what is the estimated exposure to the hazardous chemical
- exposure standards for the chemical
- spill response kits on hand, and PPE
- provision of appropriate fire protection and fighting equipment
- establish that containers are suitable and fully labelled
- establish location of the SDSs
- establish if and when personal monitoring or health surveillance takes place
- establish whether training has been provided to staff.
Physiochemical risks should also be considered, including:

- fire and explosion
- identifying ignition sources
- factor affecting fire and explosion risks
- off-site risks
- risks from corrosive substances
- compressed gases
- asphyxiation hazards
- compressed air.

13.6 Risk Control Strategies

The documented risk assessment should identify control measures to be implemented to minimise the risk to the lowest level as reasonably practical. Risk control must be achieved following the hierarchy of controls. Elimination should be considered as a means to control the risk, the best way of achieving this is to remove the hazard. If this is not possible the risk must be minimised using one or more of the other control options from the hierarchy. Risk control is to be conducted in accordance with the WHS Risk Management Guidelines. Consideration should be provided for the following subsections:

13.6.1 Stability

Controls must be put in place to ensure hazardous chemicals do not inadvertently become unstable, decompose or change. Controls should ensure hazards are not created that are different from the hazard originally created by the hazardous chemicals, or increase the risk associated with the hazardous chemicals.

If the stability of hazardous chemicals is dependent on the maintenance of levels of stabilisers, those levels must be maintained as specified by the manufacturer of the hazardous chemicals. Additionally if the hazardous chemicals are required to be stored or handled with a particular temperature range specified by the manufacturer, they must be stored or handled within that temperature range.

13.6.2 Ignition Sources

Provisions should be made to ensure any ignition sources are eliminated from hazardous areas (as defined by the Permit to Work Guidelines). Ignition sources include, but are not limited to, naked flames, static electricity, heat, sparks, internal combustion engines, heated surfaces electrical equipment, radio transmitters, mobile phones and oily material.

13.6.3 Ventilation

The generation of flammable or harmful atmospheric levels should be kept to a minimum using adequate ventilation. The minimum ventilated area should be 1m² for every 50m² of floor area.

13.6.4 Emissions

Any atmospheric emissions (toxic, corrosive, flammable, explosive or asphyxiant) that poses a risk to workers or the environment must be kept within required limits and exhausted away from occupied areas.
13.6.5 Contamination of Food and Personal Products
Provisions should be made to ensure that hazardous chemicals cannot contaminate food, food packaging or personal use products.

13.6.6 Bulk Containers
Areas where hazardous chemicals stored in bulk must ensure that:

- the container and any associated pipe work are provided with stable foundations and supports
- any pipe work or equipment connected to the container is installed so as to prevent excessive stress on the container, pipe work or equipment
- the container and any associated pipe work are protected from deterioration.

13.6.7 Transfer
When transferring hazardous chemicals:

- an appropriate area should be set aside for the purposes of transfer or decanting of hazardous chemicals products
- vapour or dust generation during transfer should be minimised
- where static electricity is generated, appropriate controls measures should be adopted to minimise the charge build up eg earthing, bonding or relaxation
- ensure the suitability of pipe work, attachments and associated safety systems in areas where the risk elimination or control measures have been proposed.

Consideration should be given to minimising the generation of static electricity and for sources of heat or ignition.

13.6.8 Safety Equipment and Access
Safety equipment must be provided, maintained and accessible if it has been determined to be required to control an identified risk in relation to the storage or handling of hazardous chemicals (including personal protective equipment and clean up equipment such as neutralisers, decontaminants and associated equipment). Additionally, a safe means of access to and from and within any locations where hazardous chemicals are stored or handled must be provided and maintained.

13.6.9 Decommissioning Plant and Equipment
Plant, equipment or containers that are to be disposed of must be made free from hazardous chemicals or otherwise made safe. If hazardous chemicals have not been placed in or taken from the plant, equipment or container for a continuous period of 12 months they should be made free of hazardous chemicals or otherwise made safe.

Provisions should be made if the hazardous chemicals container has been made free from hazardous chemicals to ensure any references, signs symbols or warnings in regards to dangerous foods it previously contained have been removed or obliterated.

If hazardous chemicals have not been put in or taken out of an underground, or partially underground or fully mounded tank (other than an LPG tank) any remaining hazardous chemicals must be removed from the tank and abandon them in accordance with AS 1940. SafeWork NSW must be notified within 7 days of the abandonment.
13.6.10 Cleaning and Housekeeping
A regular cleaning program should be in place for those areas storing or handling hazardous chemicals. This process should include the removing of dust deposits from exposed surfaces. Cleaning may more contaminants around surfaces or make them airborne so suitable methods must be investigated.

13.6.11 Materials Handling
Consideration should be given to minimising quantities of hazardous chemicals that are kept on site where possible e.g. purchase 2.5L Winchester instead of 20L drum to minimise handling of hazardous chemicals and also the risk of spills. Any materials handling must be conducted in accordance with the Materials Handling Guidelines.

13.6.12 Segregation & Separation
Provisions should be made to ensure hazardous chemicals that are not compatible with other substances (including other hazardous chemicals) are stored and handled separately from the other substances so that a loss of containment or any other interaction cannot cause a serious incident.

Minimum segregation distances are:
- solids/liquids - 1.5m
- gases - 3m.

Hazardous chemicals should be separated from people or property. Where barriers are used, these should be impervious.

13.6.13 Fuel Dispensing
The following controls must be in place for fuel dispensing:
- any self-service fuel dispensing machine shall not be operated by a person under the age of 16 years
- the driver of a vehicle being refuelled shall ensure that the vehicle is switched off before the fuel tank is opened
- the driver of a vehicle being refuelled shall ensure the vehicle remains switched off while the fuel is being dispensed into the vehicle
- no smoking or any other ignition sources are allowed within 3 metres of any point where fuel might be exposed, particularly when receiving or dispensing.

13.7 Monitoring and Review

13.7.1 Risk Assessments
All risk assessments are required to be reviewed whenever:
- there is evidence to indicate that the assessment is no longer valid
- whenever the employer is advised on any necessary preventative or remedial action as a result of Health Monitoring or an incident
- whenever there is a significant change in the work to which the assessment relates
- whenever a new SDS is issued (maximum of 5 years) or there is a change in legislation
13.8 Risk Control Strategies

Implemented controls should be reviewed to ensure that they are effective and minimising injury. This can be completed by inspecting the area or process and identifying if the controls are maintained and working properly. The effectiveness of controls can also be reviewed by analysing injuries and incidents which may have occurred.

14 Health Monitoring

The aim of air and health monitoring is not as an alternative to the maintenance of control measures, but as a method to ensure that control measures are effective and to provide an opportunity to reinforce specific preventative measures and safe work practices. Details on health monitoring can be found in the UOW Air and Health Monitoring Guidelines.

Health monitoring of a person aims to identify changes in the person’s health status because of exposure to certain substances. This may include biological monitoring where blood, urine and tissue are tested for various hazardous chemicals and personal monitoring such as the use of radiation and other badges. It may be performed in conjunction with environmental monitoring where the workplace is monitored for dust and particulates, noise, temperature, etc.

Health monitoring is mandatory for chemicals listed in Schedule 14 of the WHS Regulations, including:

- Acrylonitrile
- Arsenic (inorganic)
- Benzene
- Cadmium
- Chromium (inorganic)
- Creosote
- Crystalline silica
- Isocyanates
- Lead (inorganic)
- Mercury (inorganic)
- MOCA (4,4′-Methylenebis-(2-chloroaniline))
- Organophosphate pesticides
- Pentachlorophenol (PCP)
- Polycyclic aromatic hydrocarbons (PAH)
- Thallium
- Vinyl chloride

**NOTE:** Schedule 14 also outlines type of health monitoring required.

15 Records

15.1 Induction and Training

Adequate training should be provided to persons who handle hazardous chemicals. The WHS Act also requires the provision of induction and training. Training should meet the requirements set out in the WHS Training Guidelines.
15.2 Maintenance, Inspections and Repairs
Records should be kept to confirm that maintenance, inspections and repairs of storage areas and handling processes are regularly carried out. Inspection of storage areas should be undertaken and documented in line with the Workplace Safety Inspection Guidelines.

15.3 Records of Risk Assessments
Risk assessments are completed and stored in SafetyNet. Records shall be in accordance with this guideline and as set out in the WHS Regulation and the WHS Records Handling Guidelines.

15.4 Documentation
Any documents generated as part of this guideline must meet the requirements as set out in the WHS Document Control Guidelines.

16 Program Evaluation
In order to ensure that these guidelines continue to be effective and applicable to the University, the program will be reviewed regularly by the WHS Unit and relevant stakeholders. Conditions which might warrant a review of the guidelines on a more frequent basis would include:

- an injury or near miss resulting from storage and handling of hazardous chemicals and dangerous goods
- incidents related to storage and handling of hazardous chemicals and dangerous goods
- changes to legislation and associated standards
- worker or workplace concern.

Following completion of any review, the program will be revised and, if necessary, updated in order to correct any deficiencies.

17 Related Documents
- Asbestos Management Plan
- Biosafety Manual
- Carcinogenic Chemicals Guidelines
- ChemAlert User Guide
- WHS Consultation Statement
- WHS Document Control Guidelines
- Emergency Management Procedures
- Hazard Identification Sign
- Hazard Identification Sign Order Form
- Hazardous Waste Disposal Guidelines
- Incident Management and Reporting Guidelines
- Laboratory Safety Guidelines
- Materials Handling Guidelines
- WHS Legislative Compliance Guidelines
- Permit to Work Guidelines
- Personal Protective Equipment Guidelines
- WHS Purchasing Guidelines
- Radiation Safety Guidelines
18 Referenced Documents

18.1 Legislation & Codes of Practice

- Work Health and Safety Act 2011
- Work Health and Safety Regulation 2017
- Labelling of Workplace Hazardous Chemicals Code of Practice
- Managing Risks of Hazardous Chemicals in the Workplace Code of Practice
- Preparation of Safety Data Sheets for Hazardous Chemicals Code of Practice
- National Code of Practice for Chemicals of Security Concern
- Dangerous Goods (Road and Rail Transport) Regulation 2014
- Australian Code for the Transport of Dangerous Goods by Road and Rail (7th Edition)
- Poisons and Therapeutic Goods Act 1966
- Poisons and Therapeutic Goods Regulation 2008
- Radiation Control Act 1990
- Radiation Control Regulation 2013
- Explosives Act 2003
- Explosives Regulation 2013
- Gas Supply (Consumer Safety) Regulation 2018

18.2 Australian Standards

- AS 1319:1994 Safety Signs for the Occupational Environment
- AS 1596:2014 The storage and handling of LP Gas
- AS/NZS 1715:2009 Selection, Use and Maintenance of Respiratory Protective Devices
- AS/NZS 1716:2012 Respiratory Protective Devices
- AS 1894:1997 The storage and handling of non-flammable cryogenic and refrigerated liquids
- AS 1940:2017 The storage and handling of flammable and combustible liquids
- AS 2022:2003 Anhydrous ammonia - Storage and handling
- AS 2030.1:2009 Gas cylinders – General requirements
- AS 2030.2:1996 The verification, filling, inspection, testing and maintenance of cylinders for the storage and transport of compressed gases - Cylinders for dissolved acetylene
- AS/NZS 2161 Occupational Protective Gloves Set
- AS 2187.2:2006 Explosives – Storage and Use – Use of explosives
- AS/NZS 2210.1:2010 Occupational Protective Footwear
- AS/NZS 2243.1:2005 Safety in Laboratories - Planning and Operational Aspects
- AS/NZS 2243.2:2006 Safety in Laboratories – Chemical Aspects
- AS/NZS 2243.3:2010 Safety in Laboratories – Microbiological Aspects and Containment
- AS 2243.4:2018 Safety in Laboratories – Ionizing Radiation
- AS/NZS 2243.5:2004 Safety in Laboratories – Non-ionizing Radiations – Electromagnetic, Sound and Ultrasound
- AS 2243.6:2010 Safety in Laboratories – Plant and Equipment Aspects
- AS 2243.7:1991 Safety in Laboratories – Electrical Aspects
- AS/NZS 2243.8:2014 Safety in Laboratories – Fume Cupboards
- AS/NZS 2243.9:2009 Safety in Laboratories – Recirculating Fume Cabinets
- AS/NZS 2243.10:2004 Safety in Laboratories – Storage of Chemicals
- AS 2507:1998 The storage and handling of agricultural and veterinary chemicals
- AS 2714:2008 The storage and handling of organic peroxides
- AS 2927:2019 Storage & handling of liquefied chlorine gas
- AS 3000:2018 Electrical installations (known as the Australian/New Zealand Wiring Rules)
- AS 3780:2008 The storage & handling of corrosive substances
- AS/NZS 3833:2007 The storage and handling of mixed classes of dangerous goods, in packages and intermediate bulk containers
- AS 3961:2017 The storage and handling of liquefied natural gas
- AS 4081:2001 The storage and handling of liquid and liquefied polyfunctional isocyanates;
- AS 4289:1995 Oxygen & acetylene gas reticulation systems
- AS 4326:2008 The storage and handling of oxidising agents
- AS 4452:1997 The storage and handling of toxic substances
- ISO 6529:2006 Protective Clothing – Protection Against Chemicals - Determination of resistance of Protective Clothing Materials to Permeation
- AS/NZS 60079.14:2017 Explosive atmospheres - Electrical installations design, selection and erection
- AS/NZS 60079.17:2017 Explosive atmospheres - Electrical installations inspection and maintenance

18.3 Guidance Material
- Adopted National Exposure Standards for Atmospheric Contaminants in the Occupational Environment [NOHSC:1003(1995)]
- Australian Industrial Chemicals Introduction Scheme (formerly NICNAS - National Industrial Chemicals Notification and Assessment Scheme)
- ChemAlert Colour Ratings
- Dangerous Goods Storage Compatibility Guide
- Globally Harmonised System of Classification and Labelling of Chemicals (GHS)
- Guidelines For Health Surveillance [NOHSC:7039]
- Guidance Note for the Assessment of Health Risks Arising from Hazardous Substances in the Workplace [NOHSC:3017]
- Hazardous Chemical Information System (HCIS)
- Placarding for Storage of Hazardous Chemicals
- Security Plan for Storage and Handling of Explosives
## Version Control Table

<table>
<thead>
<tr>
<th>Version Control</th>
<th>Date Released</th>
<th>Approved By</th>
<th>Amendment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>September 1999</td>
<td>Manager WHS</td>
<td>Document created</td>
</tr>
<tr>
<td>2</td>
<td>February 2003</td>
<td>Manager WHS</td>
<td>Scheduled review. No significant changes.</td>
</tr>
<tr>
<td>4</td>
<td>January 2010</td>
<td>Manager WHS</td>
<td>Scheduled review. No significant changes.</td>
</tr>
<tr>
<td>5</td>
<td>April 2010</td>
<td>Manager WHS</td>
<td>Minor review no significant changes.</td>
</tr>
<tr>
<td>6</td>
<td>August 2010</td>
<td>Manager WHS</td>
<td>Document updated to incorporate the Personnel name change to Human Resources Division.</td>
</tr>
<tr>
<td>7</td>
<td>October 2010</td>
<td>Manager WHS</td>
<td>Revised in accordance with the recommendations from the 2010 Self Insurance Audit.</td>
</tr>
<tr>
<td>8</td>
<td>March 2012</td>
<td>Manager WHS</td>
<td>Re-brand.</td>
</tr>
<tr>
<td>9</td>
<td>August 2012</td>
<td>Manager WHS</td>
<td>Unit name change. Documented updated in accordance with WHS Regulation 2011 and Code of Practice.</td>
</tr>
<tr>
<td>10</td>
<td>September 2013</td>
<td>Manager WHS</td>
<td>Updated to incorporate GHS/WHS requirements surrounding labelling and safety data sheets. Inclusion of information surrounding the code of practice for chemicals of</td>
</tr>
<tr>
<td>11</td>
<td>April 2015</td>
<td>Manager WHS</td>
<td>Updated to meet requirements of the National Audit Tool Version 3.</td>
</tr>
<tr>
<td>12</td>
<td>November 2015</td>
<td>Manager WHS</td>
<td>Updated following HMDG Audit. Updated section 5.1. Added requirement to check stock holdings in ChemAlert prior to purchasing. Removed obsolete related documents. New section 5.3 on Laboratory Safety Inductions.</td>
</tr>
<tr>
<td>13</td>
<td>July 2016</td>
<td>Manager WHS</td>
<td>Merged Working with Hazardous Chemicals Guidelines with Dangerous Goods Storage and Handling Guidelines. Expanded GHS information. Updated references and appendices. Removed information which was duplicated from reference material. Rebrand.</td>
</tr>
<tr>
<td>14</td>
<td>September 2016</td>
<td>Manager WHS</td>
<td>Renamed Preliminary Risk Assessment to Basic Risk Assessment and clarified that it does not need to be documented and the SDS is the default for green/amber chemicals. Updated special labelling requirements in line with Schedule 9 and added labelling of non-hazardous substances.</td>
</tr>
<tr>
<td>15</td>
<td>November 2016</td>
<td>Manager WHS</td>
<td>Added Section 11.1 Storage Cabinets</td>
</tr>
<tr>
<td>16</td>
<td>July 2019</td>
<td>Manager WHS</td>
<td>Update link to DG Compatibility Guide</td>
</tr>
<tr>
<td>17</td>
<td>September 2020</td>
<td>Manager WHS</td>
<td>Updated hyperlinks</td>
</tr>
</tbody>
</table>
## Appendix 1 – Comparison of Hazard Pictograms with ADG Code Class Labels

*Source: Appendix G – *Labelling of Workplace Hazardous Chemicals Code of Practice*

<table>
<thead>
<tr>
<th>Hazard Pictograms</th>
<th>GHS Hazard</th>
<th>Dangerous Goods class labels (pictograms)</th>
<th>Dangerous goods classes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Explosives</td>
<td></td>
<td>Explosive</td>
<td></td>
</tr>
<tr>
<td>Self-reactives</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organic peroxides</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flammables</td>
<td></td>
<td>Flammable</td>
<td></td>
</tr>
<tr>
<td>Self-reactives</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pyrophorics</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-heating</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emits flammable gas in contact with water</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organic peroxides</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oxidisers</td>
<td></td>
<td>Oxidiser</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Oxidising gas</td>
<td></td>
</tr>
<tr>
<td>Gases under pressure</td>
<td></td>
<td>Non-toxic non-flammable gas, flammable gas, oxidising gas, toxic gas</td>
<td></td>
</tr>
<tr>
<td>Acute toxicity</td>
<td></td>
<td>Acute toxicity</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Acute Toxic gas</td>
<td></td>
</tr>
<tr>
<td>Acute toxicity</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Skin irritants</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eye irritants</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Skin sensitisers</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carcinogens</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Respiratory sensitisers</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reproductive toxicants</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Target organ toxicants</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Germ cell mutagens</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Source: Appendix G – Labelling of Workplace Hazardous Chemicals Code of Practice*
<table>
<thead>
<tr>
<th>Hazard Pictograms</th>
<th>GHS Hazard</th>
<th>Dangerous Goods class labels (pictograms)</th>
<th>Dangerous goods classes</th>
</tr>
</thead>
</table>
| ![Eye corrosion](image) | Eye corrosion  
Skin corrosion  
Corrosive to metal | ![CORROSIVE](image) | Corrosive to metals |
| ![Aquatic toxicity](image) | Aquatic toxicity. Not covered within the scope of workplace hazardous chemicals requirements | ![Environmental hazard](image) | Environmental hazard |
| ![No equivalent hazard pictogram](image) | No equivalent hazard pictogram | | Miscellaneous dangerous goods |
| ![Not covered within the scope of workplace hazardous chemicals requirements](image) | Not covered within the scope of workplace hazardous chemicals requirements | ![Infectious](image) | Infectious |
| ![Not covered within the scope of workplace hazardous chemicals requirements](image) | Not covered within the scope of workplace hazardous chemicals requirements | ![Radioactive](image) | Radioactive |
Appendix 2 - Placarding & Manifest Quantities

Source: Schedule 11, NSW WHS Regulation 2011

SafeWork NSW must be notified where the total quantity of a hazardous chemical (or group of hazardous chemicals) used, handled or stored at the workplace exceeds the placard quantity listed below.

<table>
<thead>
<tr>
<th>Description of hazardous chemical</th>
<th>Placard quantity</th>
<th>Manifest quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flammable gases</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Category 1</td>
<td>200L</td>
<td>5000L</td>
</tr>
<tr>
<td>Gases under pressure</td>
<td></td>
<td></td>
</tr>
<tr>
<td>With acute toxicity, categories 1, 2, 3 or 4(^1)</td>
<td>50L</td>
<td>500L</td>
</tr>
<tr>
<td>With skin corrosion categories 1A, 1B or 1C</td>
<td>50L</td>
<td>500L</td>
</tr>
<tr>
<td>Aerosols(^3)</td>
<td>5000L</td>
<td>10,000L</td>
</tr>
<tr>
<td>Not specified elsewhere in this Table</td>
<td>1000L</td>
<td>10,000L</td>
</tr>
<tr>
<td>Flammable liquids</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Category 1</td>
<td>50L</td>
<td>500L</td>
</tr>
<tr>
<td>Category 2</td>
<td>250L</td>
<td>2500L</td>
</tr>
<tr>
<td>Category 3</td>
<td>1000L</td>
<td>10,000L</td>
</tr>
<tr>
<td>Any combination of chemicals from Items 6 to 8 where none of the items exceeds the quantities in columns 4 or 5 on their own</td>
<td>1000L</td>
<td>10,000L</td>
</tr>
<tr>
<td>Category 4</td>
<td>10,000L</td>
<td>100,000L</td>
</tr>
<tr>
<td>Self-reactive substances</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type A</td>
<td>5kg or 5L</td>
<td>50kg or 50L</td>
</tr>
<tr>
<td>Type B</td>
<td>50kg or 50L</td>
<td>500kg or 500L</td>
</tr>
<tr>
<td>Type C to F</td>
<td>250kg or 250L</td>
<td>2500kg or 2500L</td>
</tr>
<tr>
<td>Flammable solids</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Category 1</td>
<td>250kg</td>
<td>2500kg</td>
</tr>
<tr>
<td>Category 2</td>
<td>1000kg</td>
<td>10,000kg</td>
</tr>
<tr>
<td>Any combination of chemicals from Items 12 to 15 where none of the items exceeds the quantities in columns 4 or 5 on their own</td>
<td>1000kg or 1000L</td>
<td>10,000kg or 10 000L</td>
</tr>
<tr>
<td>Pyrophoric liquids and pyrophoric solids</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Category 1</td>
<td>50kg or 50L</td>
<td>500kg or 500L</td>
</tr>
<tr>
<td>Self-heating substances and mixtures</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Category 1</td>
<td>250kg or 250L</td>
<td>2500kg or 2500L</td>
</tr>
<tr>
<td>Category 2</td>
<td>1000kg or 1000L</td>
<td>10,000kg or 10 000L</td>
</tr>
<tr>
<td>Any combination of chemicals from Items 17 to 19 where none of the items exceeds the quantities in columns 4 or 5 on their own</td>
<td>1000kg or 1000L</td>
<td>10,000kg or 10 000L</td>
</tr>
<tr>
<td>Substances which in contact with water emit flammable gas</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Category 1</td>
<td>50kg or 50L</td>
<td>500kg or 500L</td>
</tr>
<tr>
<td>Category 2</td>
<td>250kg or 250L</td>
<td>2500kg or 2500L</td>
</tr>
<tr>
<td>Category 3</td>
<td>1000kg or 1000L</td>
<td>10,000kg or 10 000L</td>
</tr>
<tr>
<td>Any combination of chemicals from Items 21 to 23 where none of the items exceeds the quantities in columns 4 or 5 on their own</td>
<td>1000kg or 1000L</td>
<td>10,000kg or 10 000L</td>
</tr>
<tr>
<td>Oxidising liquids and oxidising</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Category 1</td>
<td>50kg or 50L</td>
<td>500kg or 500L</td>
</tr>
<tr>
<td>Category 2</td>
<td>250kg or 250L</td>
<td>2500kg or 2500L</td>
</tr>
<tr>
<td>Description of hazardous chemical</td>
<td>Placard quantity</td>
<td>Manifest quantity</td>
</tr>
<tr>
<td>----------------------------------</td>
<td>-----------------</td>
<td>-----------------</td>
</tr>
<tr>
<td><strong>solids</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Category 3</td>
<td>1000kg or 1000L</td>
<td>10,000kg or 10 000L</td>
</tr>
<tr>
<td>Any combination of chemicals from Items 25 to 27 where none of the items exceeds the quantities in columns 4 or 5 on their own</td>
<td>1000kg or 1000L</td>
<td>10,000kg or 10 000L</td>
</tr>
<tr>
<td><strong>Organic peroxides</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type A</td>
<td>5kg or 5L</td>
<td>50kg or 50L</td>
</tr>
<tr>
<td>Type B</td>
<td>50kg or 50L</td>
<td>500kg or 500L</td>
</tr>
<tr>
<td>Type C to F</td>
<td>250kg or 250L</td>
<td>2500kg or 2500L</td>
</tr>
<tr>
<td>Any combination of chemicals from Items 30 and 31 where none of the items exceeds the quantities in columns 4 or 5 on their own</td>
<td>250kg or 250L</td>
<td>2 500kg or 2 500L</td>
</tr>
<tr>
<td><strong>Acute toxicity</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Category 1</td>
<td>50kg or 50L</td>
<td>500kg or 500L</td>
</tr>
<tr>
<td>Category 2</td>
<td>250kg or 250L</td>
<td>2500kg or 2500L</td>
</tr>
<tr>
<td>Category 3</td>
<td>1000kg or 1000L</td>
<td>10,000kg or 10 000L</td>
</tr>
<tr>
<td>Any combination of chemicals from Items 33 to 35 where none of the items exceeds the quantities in columns 4 or 5 on their own</td>
<td>1000kg or 1000L</td>
<td>10,000kg or 10 000L</td>
</tr>
<tr>
<td><strong>Skin corrosion</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Category 1A</td>
<td>50kg or 50L</td>
<td>500kg or 500L</td>
</tr>
<tr>
<td>Category 1B</td>
<td>250kg or 250L</td>
<td>2500kg or 2500L</td>
</tr>
<tr>
<td>Category 1C</td>
<td>1000kg or 1000L</td>
<td>10,000kg or 10 000L</td>
</tr>
<tr>
<td><strong>Corrosive to metals</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Category 1</td>
<td>1000kg or 1000L</td>
<td>10,000kg or 10 000L</td>
</tr>
<tr>
<td>Any combination of chemicals from Items 37 to 40 where none of the items exceeds the quantities in columns 4 or 5 on their own</td>
<td>1000kg or 1000L</td>
<td>10,000kg or 10 000L</td>
</tr>
<tr>
<td><strong>Unstable explosives</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5kg or 5L</td>
<td>50kg or 50L</td>
</tr>
<tr>
<td><strong>Unstable chemicals</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Any combination of chemicals from items 11, 29 and 42 where none of the items exceeds the quantities in columns 4 or 5 on their own</td>
<td>5kg or 5L</td>
<td>50kg or 50L</td>
</tr>
</tbody>
</table>

**Notes:**
- In item 2, Gases under pressure with acute toxicity, category 4 only applies up to a LC50 of 5000 ppmV. This is equivalent to dangerous goods of Division 2.3.
- Item 4 includes flammable aerosols.

**Determination of classification of flammable liquids**

For the purposes of this table, if a flammable liquid category 4 is used, handled or stored in the same spill compound as one or more flammable liquids of categories 1, 2 or 3, the total quantity of flammable liquids categories 1, 2 or 3 must be determined as if the flammable liquid category 4 had the same classification as the flammable liquid in the spill compound with the lowest flash point (eg. For placarding and manifest purposes, a spill compound containing 1000L of flammable liquid category 1 and 1000L of flammable liquid category 4 is considered to contain 2000L of flammable liquid category 1).