

Chemicals Risk Management Protocol

CHEMICALS LABORATORY MANAGEMENT

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1. Who are these guidelines for?

These guidelines are intended for principal investigators (PIs), Chemical Owners, designated laboratory person (DLPs), and other staff involved with laboratory management tasks chemicals related.

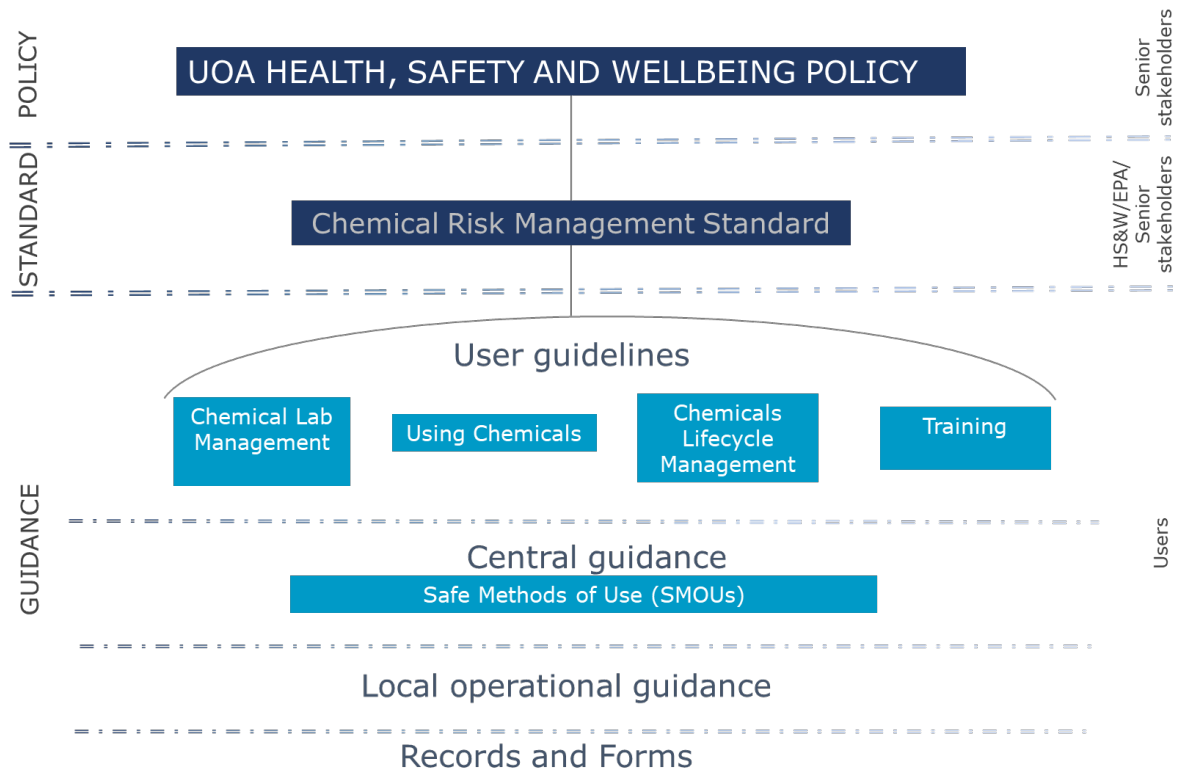
2. What is the purpose of these guidelines?

The purpose of these guidelines is to describe the legislative requirements for chemical laboratories management, including:

- The rules and responsibilities of Chemical Ownership.
- Lab access, security and signage.
- Emergency response documentation and preparation. For guidance on dealing with emergencies in the lab, please see the user guide "Emergency Procedures".
- The requirements of chemicals audits and monitoring.

3. Documentation hierarchy

The present document is part of a series of document with the following hierarchy:



4. Chemical Owner

4.1 Who is the Chemical Owner?

The owner of a chemicals is the person who has responsibility for it. Students or casual staff must not be designated as owners.

In research groups, the owner is the Principal Investigator (academic supervisor). Where a Principal Investigator can be identified as an owner, ownership must not be devolved onto anyone else.

Note: when a Principal Investigator has essentially left the University and no longer has physical oversight of their lab, they should not be the responsible owners of the

chemicals. This includes Honorary and Emeritus academics. Ownership must be transferred before leaving the University (see section 4.1).

In laboratories with analytical services, or specialised facilities used by multiple groups, the owner would usually be the person responsible for the facility.

In teaching labs, the owner is the person responsible for the teaching facility or delegated authority as approved by the Hazards and Containment Manager.

For chemicals used communally by a department, the ownership may fall to the Head of School/Department or Director as applicable or delegated authority as approved by the Hazards and Containment Manager.

Ownership must be correctly identified in the SciTrack inventory.

The key points for ownership are:

The owner needs to have oversight of how the chemicals are used. They should be engaged with the workings of the laboratory. Where this is not the case, consider whether the ownership is appropriate - if so then the owner must satisfy themselves that appropriate controls are exercised over storage, use and disposal; tasks can be delegated but the owner is accountable.

If a role (HOS/HOD/Director) is nominated as the owner, when the person filling the role changes, they must be informed about the chemicals under their ownership and the responsibilities these entail. They can request this information to the Hazard and Containment team.

4.2 Chemical Owner/Chemical Owner Legal Responsibilities

The Chemical Owner has the responsibilities of a Laboratory Manager under the Health and Safety at Work (Hazardous substances) Regulations, Part 18.12-18.13.

It is recommended that a sign on the laboratory door shows who the Laboratory Manager and any backups are and makes a reference to the Health and Safety at Work (Hazardous Substances) Regulations, Part 18. If there are multiple lab managers and/or back-up Persons in Charge, there needs to be a hierarchy, so it is clear exactly who is in charge at any given time for a given area.

The key aspects of the regulations are described below.

- Laboratory management rules
- Every laboratory (or part of a laboratory) with Hazardous Chemicals must have a Laboratory Manager. Backup Persons in Charge may be appointed by Laboratory Manager to cover their absence.
- Only one Laboratory Manager or Person in Charge may be in charge of the laboratory (or part thereof) at any one time.
- The identities of Laboratory Manager and Persons in Charge (and their roles) must be in writing.

The Laboratory Manager or Person in Charge is required to have:

- Skill and knowledge in order to prevent or manage the adverse effects of Hazardous Chemicals or be able access this information.
- Knowledge of how to handle the substance safely.
- Knowledge of correct disposal requirements
- Knowledge of laboratory emergency response plan
- Knowledge of correct use of personal protective equipment

The Laboratory Manager or Person in Charge is required to ensure that:

- All persons handling Hazardous Chemicals in the laboratory are aware of the hazardous nature of the substances, correct use of equipment and protective equipment.
- Lab users have access to SDS, Risk Assessments and Safe Method of Use documents, and these are followed.
- All persons handling Hazardous Chemicals are aware of requirements for managing, using, and disposing of the substance including emergency procedures, as per the Regulations.

4.3 When Chemical Owners leave the University

Consideration must be taken for the disposal or transfer of ownership of the chemicals and chemicals waste when leaving the University. This should be discussed with your manager as part of off-boarding.

For information on how to dispose of Hazardous Chemicals waste, see the guideline “Using Chemicals”.

4.4 Transferring ownership of chemicals

If chemicals are to be offered up to other researchers, this should be done in consultation with the Academic Head. It is important that chemicals are not hoarded without a valid case for using them. The Academic Head should consider:

1. Unused chemicals take up space, and overcrowded storage areas can lead to spills.
2. Old chemicals are unlikely to be used if a new container is available.
3. If the container packaging or labelling perishes over time, this increases disposal costs and presents a health and safety risk.
4. What is the cost in keeping the chemicals in storage? Consider audits, stocktakes, and chemicals monitoring.
5. Ownership must only be transferred with consent of the new owner.
6. When ownership is transferred, the new owner (and location if applicable) must be updated in SciTrack. The new owner can request an updated SciTrack list of the chemicals under his/her name.

4.5 Abandoned chemicals

If the Chemical Owner leaves the University without arranging for disposal/transferring, it is the Academic Head’s responsibility to ensure the chemicals are appropriately dealt with.

5. Co-locators

Co-locator is a separate legal entity that enters into an agreement with the University to receive negotiated use of space (office, laboratory and/or ancillary) and agreed ancillary support services for the purpose of deepening research-related relationships with the University.

While the agreement with the university is valid, the co-locator must, in relation with the Chemicals Risk Management of their model:

Follow the University Chemical Risk Management Standard and the Laboratory and Workshop guidelines associated with it, which includes but are not limited to responsibilities in the areas of:

- Storage and segregation
- Use of SciTrack for inventory purposes
- Adequate transport of chemicals
- Adequate chemicals waste disposal.
- Responsibilities in relation with the "Exemptions from Section 33 of the HSNO Act 1996 for small-scale research on Hazardous Chemicals". Please refer to Section 13 of this guideline.

The Co-location model documents must include:

- The assignment of the Chemical Owner for the Co-location model. The Chemical Owner has the responsibilities of a Laboratory Manager under the Health and Safety at Work (Hazardous Substances) Regulations, Part 18.12-18.13. They are the persons who have the legal responsibility for the chemicals . The Chemical Owners needs to:
 - Have oversight of how the chemicals are used,
 - Engaged with the working of the Co-location model.
 - Accomplish with all the requirements set in this Protocol.
 - In the case of a Co-location the Hazardous Substance owner must be someone at the separate legal entity.
- Standard Operational Procedure (SOPs)
- Risk Assessment of the Operation
- Emergency Response Plan
- Training Program

5.1 Using of SciTrack for the Inventory of Hazardous Chemicals

During the duration of the co-location agreement the Hazardous Chemicals used for the model should be:

- Register in SciTrack, under the name of the Chemical Owner defined for the Co-locator, for inventory purposes, unless different arrangement has been discussed with the Chemical Safety Advisor.
- No Hazardous Chemicals must be bought using SciTrack, when the Chemical Owner is a co-locator, unless different arrangements have been agreed as part of the contract.
- At the end of the agreement all Hazardous Chemicals must be transferred from Co-locator site to the Co-locator premises or dispose according to the university guidelines.

5.2 Exemptions from small-scale research on Hazardous Chemicals

Any small-scale use of Hazardous Chemicals in research and development or teaching is exempt from restriction of import, manufacture, development, field testing, or Hazardous Chemicals, under section 33 of the HSNO Act 1996, only if

- the use occurs in a laboratory that meets the requirements prescribed under the Health and Safety at Work Act 2015; and
- the use does not create or involve a Hazardous Substance for which any application for approval has been declined under the Act; and
- the use does not create or involve a persistent organic pollutant; and
- the importation, storage, and transportation of the Hazardous Chemicals each meets the prescribed requirements; and
- no such hazardous substance, nor any substance created from that use, is sold as a substance or in a product containing or derived from that substance, except as provided for in subsection (2) of Section 33 of the HSNO Act 1996.

6. Laboratory signage

All entrances to the laboratory must have signage stating that only authorised persons are permitted inside the laboratory unless under supervision (e.g., sign clearly states "Authorised Entry Only").

The identity of the Laboratory Manager(s) and Person(s) in Charge shall be displayed on a notice outside each laboratory or in a prominent place on each floor. Only one person shall be in charge of the laboratory or part thereof at any one time and this should be made clear on the notice. See the Annex 1 for an example of lab signage.

7. Laboratory security and supervision

Laboratory Managers shall be responsible for all Hazardous Chemicals and their use within individual laboratories or designated parts, as indicated on signage.

For more information about the responsibilities of Laboratory Manager, please see section 4, of this guidelines under "Chemical Owners".

8. Laboratory security

To prevent unauthorised access to Hazardous Chemicals, laboratories (or laboratory floors) are required to always have restricted key or swipe card access.

9. Access for Visitors and Contractors

Visitors in the laboratory shall be under the supervision of an authorized member of the laboratory when in an area where chemicals are held. Children under the age of 16 years shall not be permitted where chemicals are used, unless on an arranged supervised study or tour.

Cleaning and maintenance personnel as well as supply company representatives may gain access to laboratory spaces but generally under the approval of the Laboratory Manager. In higher risk areas, direct supervision by laboratory staff may be required.

The Chemical Owner shall ensure maintenance personnel and contractors are adequately instructed about the Hazards present in the laboratory and shall ensure that Hazardous Chemicals in the immediate area of the maintenance work are removed prior to maintenance work commencing. This task can be delegated to technical staff, but the Chemical Owner maintains the responsibility to disclose chemical hazards to the technical staff adequately to perform the task.

10. Laboratory supervision

Supervision requirements shall be determined by local guidance, taking into consideration the risk associated with the types of activities being undertaken in the area. Consider:

- A policy for working alone and/or outside regular work hours.
- Management of after-hours access.
- Having a list of designated Persons in Charge deemed competent to supervise higher risk activities in the absence of the Chemical Owner.
- Risks inherent to being in certain spaces, even when low risk activities are being performed.

11. Emergency Response Plan (ERP)

All laboratories, irrespective of quantities of Hazardous Chemicals present, are required to have an emergency response plan (ERP) that meets regulations 5.6 to 5.13 of the Health and Safety at Work (Hazardous Substances) Regulations 2017.

The Chemicals Risk Management guideline "Using Hazardous Chemicals" covers the actions to be taken in response to a chemical emergency. However, additional documentation is required at a local level which includes:

- Identifying each person responsible for actions to be taken in an emergency and their contact details. This may include staff involved in day-to-day laboratory management, fire wardens, and those trained in first aid.
- Specifying the location of items of equipment to be used in managing an emergency. For example, spill kits, eye wash stations, safety showers, first aid kits, and fire extinguishers.

This information, including the emergency procedures, must be readily accessible to all laboratory users.

The emergency response plan must be tested at least annually to demonstrate whether the plan is workable and effective. This can be done using a simulation of a chemical emergency. It should involve as many of the laboratory users (both staff and students) as possible. Records must be maintained of tests for two years. While this task can be

performed by technical staff it will need input from the Chemical Owners to ensure that the drill somehow represents a real life situation and that is a meaningful exercise to verify users knowledge of the Emergency Response Plan.

12. Hazard plans

A hazard plan is to be kept updated for every floor that has hazards (including hazardous Chemicals, radiation, and biological containment). This is a marked-up floor plan that is to be made available to emergency services in case of a call out. The Technical Manager (or delegated authority) will be asked by the Chemical Safety Advisor to coordinate a review of the plans every 1-2 years liaising with the Chemical Owner when necessary. The frequency is determined by the Technical Manager based on whether significant changes are likely within a year. To obtain the current hazard plan for your area, please contact the Chemicals Safety Advisor. An example is shown in Annex 2.

13. Verifications

Regular internal and external verifications help to ensure that chemicals are being managed safely in alignment with regulations and the Chemicals Risk Management Protocol.

13.1 Internal verifications

It is the responsibility of the Chemical Owner to ensure that internal inspections are carried out at least 3 times per year. The inspection can be carried out by the Chemical Owner or their delegate. The laboratory inspection checklist provided on the Health, Safety and Wellbeing website can be used and modified to suit your needs.

With regard to chemicals, a laboratory inspection should check:

1. chemicals containers are clearly labelled and in good condition.
2. chemicals storage cabinets and spill trays are clean and in good condition.
3. chemicals are segregated according to hazard class. In particular, check that nitric acid is not stored with flammable acids such as acetic and formic acid, and oxidisers are stored separately from flammables.

4. Work areas are clean and free from clutter.
5. PPE and fume hoods are being used correctly.

13.2 Central verification

The Chemical Safety Advisor will perform at least one yearly verification. A SciTrack data analysis, Damstra incidents reports and local management feedback, will be used to inform the scope, coverage and methods. This is to provide central oversight and a robust and consistent system across the University.

14. Chemicals clear-outs

There shall be regular checks for old chemicals that are no longer required. This could be a part of stocktaking or internal audits. Consider:

- Would a researcher actually use this old chemical rather than using/buying a new bottle?
- The ongoing cost involved in keeping legacy chemicals includes space taken up, time in inspections and stocktaking, and in some cases resources to monitor Hazardous Substances formation such as peroxides.
- Old chemicals can present a hazard if they decompose, or their containers become compromised.

15. Monitoring of chemicals in storage

Certain classes of chemicals require regular monitoring to ensure they are safe to use.

15.1 Wetted explosives

Picric acid and dinitrophenols must be kept wetted with at least 30% w/w water. These Hazardous Chemicals must be monitored regularly for water levels in accordance with the University's SMOU for Picric Acid.

15.2 Peroxide-forming chemicals

Certain chemicals can undergo autooxidation particularly on exposure to air and light to produce peroxides. These peroxide by-products may be shock-sensitive and may detonate when concentrated. Therefore, it is important to test these chemicals on a yearly basis to check for peroxide formation, and especially before concentrating them. Please refer to the University's SMOU for peroxide-forming chemicals for further instructions.

Common peroxide-forming chemicals include diethyl ether, tetrahydrofuran, dioxane and 2-butanol.

Test all peroxide-formers prior to distillation.

Never test containers of unknown age or origin. Old bottles may contain concentrated peroxides, or peroxides may have crystallised in the cap threads which present a serious hazard when opening the bottle. Please contact Hazard & Containment team for further advice.

16. Exposure and Air Monitoring

In some situations, there may be concern about chemicals exposure despite all reasonable controls being implemented to control the risk. In this case, an assessment of environmental chemicals levels and personal exposure can be performed by companies with this expertise. Alternatively, monitors can be purchased that analyse specific chemical levels in real time. For assistance with this please contact Health, Safety and Wellbeing hsw@auckland.ac.nz.

Monitoring systems may be built into certain labs or can be used as needed. Some common examples of monitoring are:

1. Use of oxygen depletion monitors where asphyxiant gases are in use
2. Carbon dioxide monitors, particularly in fermentation rooms
3. Portable monitors for specific toxic gases such as carbon monoxide and formaldehyde.

17. Definitions

The following definitions apply to this document:

Authorised person means a person who, in the normal course of their work, is required and permitted to enter the laboratory and therefore provided with personal access (i.e., own functioning access card). Additionally, anyone under the direct supervision of an authorised person is deemed authorised.

Chemical is a distinct compound or substance, especially one which has been artificially prepared or purified.

Co-locator means a separate legal entity that enters into an agreement with the University to receive negotiated use of space (office, laboratory and/or ancillary) and agreed ancillary support services for the purpose of deepening research-related relationships with the University.

Co-location agreement refers to the agreement signed between the University, UniServices and Co-locator outlining each parties' rights, responsibilities and obligations for the term of the co-location.

Co-location model refers to the policies, processes and guidelines for a particular type of co-location that are approved to occur at the University and includes the University Start-up model, Commercial model and Precinct model.

Co-location site refers to the designated space on University premises where co-locations are permitted to occur for each co-location model, including either shared space or space exclusively allocated to the co-locator.

Compound means any chemical combination of chemical elements.

Laboratory Manager Means the designated laboratory manager that meets the requirements of section 33 of the HSNO Act 1996 and Part 18 of the Health and Safety at Work (Hazardous Substances) Regulations 2017.

Chemical Owner Is the term that the UoA use to name the designated *Laboratory manager* (See Laboratory Manager definition)

It defines the person with ownership and responsibility for the chemicals. They may be a *Principal Investigator* (PI) or when a PI cannot be identified, the chemical owner is

the person responsible for the facility in which the Hazardous Substance is used and may be a senior technician or a technologist. In the case of 'communal' departmental/school chemicals, the academic head may be the chemical owner.

They have the responsibilities stated under responsibilities of a Laboratory Manager under the Health and Safety at Work (Hazardous Substances) Regulations, Part 18. For further details see the Chemical Ownership guidelines.

Designated laboratory person (DLP) means the trained person in each research group who has been given the authority to approve purchase requests made in SciTrack.

Forms are the blank templates to be filled in with information that will become these records.

Hazard A hazard is a source or a situation with the potential for harm in terms of human injury or ill-health, damage to property, damage to the environment, or a combination of these.

Hazardous Chemicals or Hazardous Substance is any substance with 1 or more of the following intrinsic properties:

- explosiveness
- flammability
- a capacity to oxidise
- corrosiveness
- toxicity (including chronic toxicity)
- ecotoxicity, with or without bioaccumulations; or

Which on contact with air or water (other than air or water where the temperature or pressure has been artificially increased or decreased) generates a substance with any 1 or more of the properties specified above.

A hazardous substance has one or more hazard classifications in its safety data sheet.

Chemical Risk Management Protocol (The 'Protocol'): This protocol falls under the University's Health, Safety and Wellbeing Policy, and includes the Chemical Risk Management Standard and a set of guidelines on Chemical Risk Management topics.

Laboratory means a vehicle, room, building, or any other structure set aside and equipped for scientific experiments or research, for teaching science, or for the development of chemical or medicinal products

Laboratory Chemicals includes hazardous chemicals used in laboratories and workshops. It does not include commercial cleaning products or chemicals that you can buy from a supermarket or hardware store. Note however that large quantities of industrial chemicals such as isopropanol should be recorded in the laboratory's chemical inventory.

Line Manager refers to anyone working at the University of Auckland and who guides or controls research, teaching, budget, workspace or people (staff, visiting researchers or contractors)

Local Operational Guidelines. Generated by Schools, Departments, Specific Laboratories, Workshops or external organizations (Example: Procedures and Operational Instructions based on International Standards or best practices, etc). That have been approved by Line Manager or Academic Leaders to set performance standards for their specific area of responsibility.

Principal Investigator (PI): An academic staff member who is the lead researcher responsible for project(s) such as laboratory study(ies) or clinical trial(s) and is usually the holder of and independent grant administered by the University. The phrase is also often used as a synonym for "head of the laboratory" or "research group leader." The Principal Investigator is responsible for assuring compliance with applicable University standards and procedures, and for the oversight of the research study and the informed consent process. Although the PI may delegate tasks to members of their research team or technical staff (if this is officially agreed), they retain responsibility for the conduct of the study and the Management of the Hazardous Substances under their ownership. PIs are Academic Leaders for the Health, Safety and Wellbeing Policy, and as such must accomplish with the responsibilities stated in that Policy.

Records is what is chosen by the Line Manager or Academic Leader to demonstrate that the process and activities have been conducted in the way prescribed in the Local Operational Guidelines.

Risk assessment is the process of evaluating the risk(s) arising from the hazard(s), considering the adequacy of any existing or potential controls, deciding whether or not the risk(s) is acceptable, and taking further action as required.

A risk assessment is created in alignment with the University's Health and Safety Risk Management Standard and authorised at the appropriate level.

SciTrack is the University's purchasing and inventory management system for chemicals and restricted biologicals. SciTrack suppliers include all University-approved suppliers of Hazardous laboratory chemicals and/or restricted biologicals. All purchases from SciTrack suppliers (including non-hazardous lab consumables) must go through SciTrack.

Separate legal entity means any person or individual (e.g. company, partnership, charitable trust) that has its own legal rights and obligations, separate to the University. This includes University spinout companies.

Substance means:


- any element, defined mixture of elements, compounds, or defined mixture of compounds, either naturally occurring or produced synthetically, or any mixtures thereof:
- any isotope, allotrope, isomer, congener, radical, or ion of an element or compound which has been declared by the Authority, by notice in the New Zealand Gazette, to be a different substance from that element or compound:
- any mixtures or combinations of any of the above:
- any manufactured article containing, incorporating, or including any hazardous substance with explosive properties

Staff members refers to individuals employed by the University on a full or part-time basis.

University means the University of Auckland and includes all of its subsidiaries.

18. Annexes

18.1 Annex 1 Laboratory signage example

		SCIENCE		School/Dept		
Room No.		Name of space				
AUTHORISED PERSONNEL ONLY						
NO ENTRY WITHOUT SUPERVISION						
CONTACTS						
Laboratory Manager	Room No.	Extn	Person in charge	Extn	Mobile number	
<p>"Laboratory Managers" (aka Chemical Owners) are responsible for ensuring safe storage and use of their chemicals as per Health and Safety at Work (Hazardous Substances) Regulations 2017</p>						
PRIMARY HAZARDS						
PRECAUTIONS BEFORE ENTERING						

18.2 Annex 2 Hazard plans example

