Health and Safety Risk Assessment

Activity / Task / Location: Chemistry HSC Experiment Fest, SB209/210/211 Callaghan, SL1-121 Ourimbah	**Reviewed / Approved By: Scott Donne** **Signature and Date:** 03/04/25
Risk Assessment Developed by: Timothy Kirkman	**Date:** 02/05/23

Risk Matrix

Likelihood

N.B. For more details regarding use of this matrix / definitions refer to final page of this document

Consequence	Rare	Unlikely	Possible	Likely	Almost Certain
Severe *Eg. Potential Fatality or Injury or Illness with permanent disability*	MEDIUM	MEDIUM	HIGH	EXTREME	EXTREME
Major *Eg. Potential Lost Time Injury (but non-permanent disability)*	LOW	MEDIUM	MEDIUM	HIGH	EXTREME
Moderate *Eg. Potential Medical Treatment injury or illness (but no lost time)*	LOW	LOW	MEDIUM	MEDIUM	HIGH
Minor *Eg. Potential First Aid injury*	LOW	LOW	LOW	MEDIUM	MEDIUM
Minimal *Eg. Hazard or near miss requiring reporting and follow up action*	LOW	LOW	LOW	LOW	LOW

Actions required based on Risk Assessment

Extreme	An "extreme" risk requires immediate assessment and senior staff consideration is required; a detailed mitigation plan must be developed, and consideration should be given to ceasing the activity unless the risk can be reduced to a level of high or less; regular monitoring and reported on to the relevant management/steering committee; Target resolution should be within 1 month.
High	A "high" risk may also require immediate assessment and senior staff consideration; a mitigation plan must be developed; regular monitoring and reported on to the relevant management/steering committee. Target resolution (ideally reduction to medium or low level of risk) should be within 3 months.
Medium	A mitigation plan must be developed; existing controls need to be reviewed. Target resolution (ideally reduction to low level of risk) should be within 1 year.
Low	Risk is tolerable; manage by well established, routine processes/procedures and be mindful of changes to nature of risks.

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Hazard Identification and initial Risk Rating			Control measures and Residual Risk Rating		Remaining Hazards	Actions required
What are the steps of the activity / items of equipment?	What are the potential hazards?	Risk Rating based on Risk Matrix	What control methods or measures will be used to reduce the likelihood and/or the consequence of an illness or injury from those hazards?	Residual Risk Rating based on Risk Matrix	What hazard remains?	What additional actions are required (by who and in what timeframe) to raise the level of control?
Use of glassware	Cuts from broken glass	**Medium**	Students instructed to properly secure all equipment and to use equipment as instructed in the laboratory manual. In the event of breakage, broken glass is to be cleaned up using a dustpan and brush and placed in an appropriate broken glass bin. Broken glass should not be handled	**Low**	Cuts from broken glass are still possible but unlikely	None
Use of burette/pipette	Breakage may occur if used incorrectly	**Medium**	Students are instructed to remove the burette from the retort for filling. Plastic funnels to be used to refill burettes. Pipette to be stored in such a way as of prevent them rolling off the bench. Do not pipette by mouth.	**Low**	Cuts from broken glass are still possible but unlikely	None

Use of hot plate and steambath	Hot equipment and glassware may cause burns.	**Medium**	Take care in handling all equipment and glassware while hot. Use rubber 'fingers', tongs or wooden pegs. Use boiling chips when boiling liquids to prevent bumping.	**Low**	Minor burns are still possible but unlikely	None
Use of Atomic Absorption Spectrophotometer	Flammable gas (acetylene) used. Risk of explosion during ignition.	**High**	Trained technical staff to setup instrument prior to commencement of class. Safety glasses to be worn at all times.	**Low**	Potential for serious injury but extremely unlikely to occur	None
Conc. Phosphoric Acid (H_3PO_4) – 14M	Highly corrosive liquid. Causes severe burns/skin irritation. Risk of serious damage to eyes. Contact with combustible material may cause fire. Toxic by inhalation. Reacts violently with water.	**High**	Minimal quantities used (<10mL) in dropper bottle. Use only in fume hood, do not breathe fumes & vapour Avoid contact with skin & eyes. Wear full PPE, eye protection and suitable gloves Thoroughly wash affected area with water in the event of a spill.	**Low**	Spill risk with skin/eye irritation/burns still possible but unlikely	None
Acetic Annhydride	Highly corrosive liquid. Causes severe burns/skin irritation. Risk of serious damage to eyes. Contact with combustible material may cause fire. Toxic by inhalation. Reacts violently with water.	**High**	Minimal quantities used (<10mL) in dropper bottle. Use only in fume hood, do not breathe fumes & vapour Avoid contact with skin & eyes. Wear full PPE, eye protection and suitable gloves Thoroughly wash affected area with water in the event of a spill.	**Low**	Spill risk with skin/eye irritation/burns still possible but unlikely	None

Hydrochloric Acid Solution (HCl) – 0.1M	Corrosive liquid. Causes burns/skin irritation. Risk of serious damage to eyes.	**Medium**	Dilute solution used ~0.1M Avoid contact with skin & eyes. Wear full PPE, eye protection and suitable gloves Thoroughly wash affected area with water in the event of a spill.	**Low**	Spill risk with minor skin/eye irritation/burns still possible but unlikely	None
Electrical equipment	Exposure to dangerous voltages from faulty equipment.	**Medium**	Regular checking and tagging of mains powered equipment, including computers, for frayed cords and poor earth continuity to case of equipment. Check all power cords for visible deterioration prior to each use.	**Low**	Electrical shock and potential for serious injury but extremely unlikely to occur	None
Obstructions in walkways.	Trip hazard due to obstructions in walkways.	**Low**	Advise students to keep bags under benches to avoid obstructions.	**Low**	Tripping still possible but unlikely.	None

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Summary of Requirements based on Risk Assessment		Review Period / Date
Personal Protective Equipment	Safety Glasses, Long Pants, Laboratory Coat, Fully enclosed shoes	May 2026
Other Equipment and Equipment Protection	Atomic Absorption Spectrophotometer, UV-Vis Spectrophotometer, burette, pipette, various glassware	May 2026
Training Requirements	Safety talk provided by laboratory demonstrators and technical staff prior to commencing work	May 2026
Procedures, SOPs etc	AEP Lab Risk Assessment 2017, CHEM - Spectrophotometer SHIMADZU UV 1800 CHEM092A AEP lab, CHEM - Spectrometer VARIAN SpectrAA 55 CHEM085, OURGEP001 Thermo 10S UV Vis Spectrophotometer, SOP for USE OF GLASSWARE, Spectra AAS 220	May 2026
Relevant Legislation etc.	WHS Act 2011 (NSW) & Regulations / Codes of Practice	

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Health and Safety Risk Assessment

Questions to ask in order to determine the hazards relating to the task:

A Could people be injured or made sick by things such as:

- Noise
- Light
- Radiation
- Toxicity
- Infection
- High or low temperatures
- Electricity
- Moving or falling things (or people)
- Flammable or explosive materials
- Things under tension or pressure (compressed gas or liquid; springs)
- Any other energy sources or stresses
- Biohazardous material
- Laser

B Can workplace practices cause injury or sickness?

- Are there heavy or awkward lifting jobs?
- Can people work in a comfortable posture?
- If the work is repetitive, can people take breaks?
- Are people properly trained?
- Do people follow correct work practices?
- Are there adequate facilities for the work being performed?
- Are universal safety precautions for biohazards followed?
- Is there poor housekeeping? Look out for clutter
- Torn or slippery flooring
- Sharp objects sticking out
- Obstacles

C Imagine that a child was to enter your work area?

- What would you warn them to be extra careful of?
- What would do to reduce the harm to them?

D What could go wrong?

- What if equipment is misused?
- What might people do that they shouldn't
- How could someone be killed?
- How could people be injured?
- What may make people ill?
- Are there any special emergency procedures required?

E Are procedures or organisational systems missing or not being followed?

- Standard Operating Procedures?
- Risk Assessments?
- Induction or training?
- Management of change?
- Safety Inspections?
- Hazard reporting?
- Contractor Management?

F What kinds of injuries could possibly occur?

- Broken bones
- Eye damage
- Hearing problems
- Strains or sprains
- Cuts or abrasions
- Bruises
- Burns
- Lung problems including inhalation injury/ infection
- Skin contact
- Poisoning
- Needle-stick injury
- Psychological illness or injury

Health and Safety Risk Assessment

How to Assess Risk

Step 1 – Consider the Consequences

What are the potential consequences of an incident occurring?
Consider what could reasonably happen as well as what may actually happen.

Look at the descriptions and choose the most suitable Consequence.

Consequence	
Serious	Potential Fatality or Injury or Illness with permanent disability
Major	Potential Lost Time Injury requiring time off work (but non-permanent disability)
Moderate	Potential medical treatment Injury or Illness but no lost time
Minor	Potential First Aid Injury
Minimal	No injury but hazard exists or near miss occurred requiring reporting and follow up action

Step 2 – Consider the Likelihood

What is the likelihood of the consequence identified in step 1 happening?

Consider this with the current controls in place.

Look at the descriptions and choose the most suitable Likelihood.

Likelihood	
Almost Certain	The event could be expected to occur in most circumstances: "This is a common problem here".
Likely	The event has a reasonable chance of occurring in usual conditions: "It has happened here before".
Possible	The event might occur occasionally, has occurred sometime: "Has infrequently happened here before".
Unlikely	The event has a small chance of occurring. "It has not happened here but has occurred elsewhere".
Rare	Very unlikely to occur. "It would be extremely rare for it to occur here".

Step 3 – Calculate the Risk Rating

A. Take Step 1 rating and select the correct column.

B. Take Step 2 Rating and select the correct line.

C. The calculated risk rating is where the two ratings cross

CONSEQUENCE	LIKELIHOOD: Rare	Unlikely	Possibly	Likely	Almost Certain
Serious	MEDIUM	MEDIUM	HIGH	EXTREME	EXTREME
Major	LOW	MEDIUM	MEDIUM	HIGH	EXTREME
Moderate	LOW	LOW	MEDIUM	MEDIUM	HIGH
Minor	LOW	LOW	LOW	MEDIUM	MEDIUM
Minimal	LOW	LOW	LOW	LOW	LOW

Controlling the Risk: Risk control is a method of managing the risk with the primary emphasis on controlling the hazards at source. For a risk that is assessed as "extreme" or "high", steps should be taken immediately to minimize risk of injury. The method of ensuring that risks are controlled effectively is by using the "hierarchy of controls". The Hierarchy of Controls are:

Control Type	Example
Eliminate	Removing the hazard, eg taking a hazardous piece of equipment out of service.
Substitute	Replacing a hazardous substance or process with a less hazardous one, eg substituting a hazardous substance with a non-hazardous substance.
Engineering	Redesign a process or piece of equipment to make it less hazardous, Isolating the hazard from the person at risk, eg using a guard or barrier, or containing the hazard in an enclosure.
Administrative	Adopting safe work practices or providing appropriate training, instruction or information.
Personal Protective Equipment (PPE)	The use of personal protective equipment could include using gloves, glasses, earmuffs, aprons, safety footwear, dust masks. **NOTE: This is a last resort control and should be used in conjunction with higher level controls.**

For more information visit - http://www.newcastle.edu.au/current-staff/working-here/work-health-and-safety/managing-health-and-safety-risks