

Appendix B WHS Hazard and Risk Assessment Template

Research School of Physics

- This form is used when a documented risk assessment is required in accordance with Appendix A of WHSMS Handbook Chapter 3.1.
- Original risk assessments must be located in a convenient location in the local area accessible by all people affected by the risk assessment.
- Risk assessment for static hazards/tasks/activities must be forwarded to local WHS Officer/Manager for inclusion in the School/Service Division Static Risk Assessment Template.

Static Risk Assessment No.		Assessment Date	Reviewed by Date	Version
AppB_RSPhys WHS_RA_Bdg_58B_Weigold_W2.06_V1.0		25/5/2020	25/5/2022	1.0
Name of the Task/Activity/Area/Hazards assessed	ANFF Laboratory Work – nanofabrication for users and process development		Top Residual Risk (L, M, H, E)	
			Medium (11)	
Description of the activity/task & location	ANFF covers 4 labs in RSPhys, each about 40-50m2 in size. In addition, there is another lab located in JCSMR which is about 25m2. (This exclude 2 MOCVD labs which are still under maintenance due to hailstorm damage)			
School/Service Division	Research School of Physics, College of Science			
Location and Supervisor	Location	Supervisor	Ph	
	W2.06	Prof. Hoe Tan	50356	
Risk Assessment Team	Name	Email	Ph	
	Craig Young	Craig.young@anu.edu.au	0409656273	
Have you completed ANU WHS Risk Management Training? <input checked="" type="checkbox"/> Y <input type="checkbox"/> N IF NO, DO NOT PROCEED	Name	Email	Ph	
	Name	Email	Ph	
	Name	Email	Ph	
Who are affected by this RA?	<input checked="" type="checkbox"/> All people in the location <input type="checkbox"/> A group/s of people (list below) <input type="checkbox"/> A single person (list below)			
Who are consulted on this RA? (All persons affected or their representatives needs to be consulted)	Christopher Kafer, Gayatri Vaidya, Li Li, Mykhaylo Lysevych, Olivier Lee Cheong Lem			
WHS Legal and Other Requirements	Work Health and Safety Act 2011 (Cth) Work Health and Safety Regulations 2011 (Cth) ANU Chemical Management Handbook Dangerous Substances Act (2004) Dangerous Substances (General) Regulation (2004) Labelling of Workplace Hazardous Chemicals Code of Practice SafeWork Australia WorkSafe ACT Australian Radiation Protection and Nuclear safety ACT 1998 Australian Radiation Protection and Nuclear Safety Regulations			
Type of RA	<input checked="" type="checkbox"/> Static RA (long term and > 6 months) - Send a copy (electronic) to WHS Officer/Manager and keep original locally near the activity/location, accessible to all people affected. <input type="checkbox"/> Dynamic RA (short term and < 6 months or once off) – Keep the original locally (electronically or physically) near the activity/location, accessible to all people affected.			

Risk Assessment Instruction

- Select hazards from **Table 1** below and transfer them into the 'Hazards' column of the RA Form.
- Enter where and when this hazard exists. This may include specification of during which step, this hazard exists.
- Estimate inherent risk of the hazard (without any controls in place) by using Likelihood against Consequences (defined in **Table 2**) and the ANU WHS Risk Matrix (**Table 3**). List them in 'Inherent Risk' column of the RA Form.
- Develop control measures in accordance with the Hierarchy of Control Principle (**Table 4**) and list them in 'Control' column of the RA Form.
- Estimate the residual risk of the hazard after implementing all controls. Remember that administrative control can only reduce the likelihood of an event occurring, not the consequences.
- Identify any controls that are not in place as corrective actions and implement them before undertaking the activity.
- Obtain approval from relevant people as identified.
- Identify if this is a static risk assessment (> 6 months) or dynamic risk assessment (< 6 months).
- Send a copy of the static risk assessments to WHS Officers/Managers/Equivalent – Keep on file for 7 years.
- Keep originals of risk assessments in close vicinity of the activities. Dynamic risk assessments can be destroyed 1 year after the activity ceases.
- Review the static risk assessments and associated safe work procedures in accordance with **3.1.2.6 Step 4: Review Control Measures** requirements

Table 1. Hazard Selection Table for Hazard Profiles

Electrical		
<input type="checkbox"/> Electrical Shock (both minor and major)	<input type="checkbox"/> Electrical Burns (both minor and major)	<input type="checkbox"/> Electrocutation
<input type="checkbox"/> Overheating and fire	<input type="checkbox"/> Other, please specify:	
Chemical		
<input type="checkbox"/> Airborne contaminants that poses a health hazard	<input type="checkbox"/> Explosive substances	<input type="checkbox"/> Self-reactive or self-heating chemicals
<input checked="" type="checkbox"/> Flammable <input checked="" type="checkbox"/> Liquid <input type="checkbox"/> Solid <input checked="" type="checkbox"/> Gas <input type="checkbox"/> Airborne contaminants	<input checked="" type="checkbox"/> Corrosive <input type="checkbox"/> Substances <input checked="" type="checkbox"/> Gas <input type="checkbox"/> Airborne contaminants	<input checked="" type="checkbox"/> Hazards during storage (e.g. mixed hazards storage, dangerous when wet, temperature sensitive, heat & friction sensitive etc)
<input type="checkbox"/> Organic peroxide or peroxide-forming chemicals	<input type="checkbox"/> Oxidising substances	<input type="checkbox"/> Hydrofluoric acid (HF)
<input type="checkbox"/> Asphyxiate gas (e.g. CO ₂ including dry ice, liquid N ₂)	<input checked="" type="checkbox"/> Toxic and health hazard substances	<input type="checkbox"/> Toxic gas (e.g. Hydrogen cyanide, cyanogen)
<input type="checkbox"/> Respiratory irritants (e.g. engineered nanomaterials, dust, asbestos)	<input type="checkbox"/> Chemical spraying (e.g. agricultural, pesticides)	<input type="checkbox"/> Chemicals requiring health monitoring (e.g. Schedule 14 Chemicals).
<input type="checkbox"/> Prohibited and restricted carcinogens	<input type="checkbox"/> Mutagens or reproductive system hazards	<input checked="" type="checkbox"/> Mix two chemicals to form a new chemical
<input checked="" type="checkbox"/> Chemical spill – Controlled or uncontrolled	<input type="checkbox"/> Exposure to Hazardous Materials (e.g. Asbestos, Lead or Mercury).	<input type="checkbox"/> Other, please specify:
Biological		
<input type="checkbox"/> Live animal handling (e.g. bites, allergies)	<input type="checkbox"/> Potential of uncontrolled outbreak of an infectious disease	<input type="checkbox"/> Pathogen or body fluid contamination
<input type="checkbox"/> Exposure to viruses including blood borne viruses	<input type="checkbox"/> Infective microorganism exposure	<input type="checkbox"/> Exposure to communicable or infectious disease as a research object
<input type="checkbox"/> GMO exposure and security	<input type="checkbox"/> Sharps and contaminated sharps	<input type="checkbox"/> Biological material spillage
<input type="checkbox"/> Other, please specify:		
Plant and Equipment		
<input type="checkbox"/> Entanglement and trapping parts	<input type="checkbox"/> Crushing, rotating and cutting parts	<input type="checkbox"/> Serious burn/cold
<input type="checkbox"/> Ejection of piece/s; shattering or fragmentation; Explosion; Implosion	<input type="checkbox"/> Stabbing, puncturing, shearing, friction, abrasion	<input type="checkbox"/> Lifts or suspends a load (e.g. falling objects)
<input type="checkbox"/> Rollover or striking against the plant	<input type="checkbox"/> Pressurised vessels (e.g. autoclave, boilers, steam generator)	<input type="checkbox"/> Mobile lifting equipment and Elevated Work Platform (e.g. heavy load fall from height)
<input type="checkbox"/> Hazardous levels of heat or vibration (generated by plant to whole or part body)	<input type="checkbox"/> Potential exposure to fluids under high pressure	<input type="checkbox"/> Other, please specify:
Noise		
<input type="checkbox"/> Exposure to 85dB(A) LAeq, 8h	<input type="checkbox"/> Exposure to peak noise level of 130 dB(C) any time during the work activity	<input type="checkbox"/> Exposure to vibration & ototoxic chemicals
<input type="checkbox"/> Exposure to ototoxic chemicals: <input type="checkbox"/> At any noise level <input type="checkbox"/> > 50% of the OEL of the chemical at any noise level <input type="checkbox"/> At over 100 dB noise level but any level of exposure to ototoxic chemicals	<input type="checkbox"/> Nuisance level of noise causing discomfort	<input type="checkbox"/> Other, please specify:
Radiation		
<input type="checkbox"/> Sealed or Unsealed sources (alpha, beta or gamma)	<input checked="" type="checkbox"/> Exposure to EM Radiations (e.g. X-ray, UV, infrared)	<input checked="" type="checkbox"/> Exposure to artificial radiation (e.g. laser)
<input type="checkbox"/> Security of sealed and unsealed sources	<input type="checkbox"/> Other, please specify:	
Ergonomics and manual tasks		
<input type="checkbox"/> Repetitive or sustained forces	<input type="checkbox"/> Sustained awkward static postures	<input type="checkbox"/> Repetitive movements
<input type="checkbox"/> Long duration	<input type="checkbox"/> High Forces	<input type="checkbox"/> Long duration of the same posture (e.g. standing, sitting)
<input type="checkbox"/> Animal handling or handling unbalanced/unpredictable load	<input type="checkbox"/> Transfer of item(s) up or down stairs, using both hands or requiring the use of lifting equipment from one level to another	<input type="checkbox"/> Repetitive, monotonous work, at a high pace
<input type="checkbox"/> Repetitive, monotonous work, at a high pace	<input type="checkbox"/> Repetitive, monotonous work, at a high pace	<input type="checkbox"/> Repetitive, monotonous work, at a high pace
<input type="checkbox"/> Other, please specify:		
Public Safety		
<input type="checkbox"/> Uncontrolled spread of hazardous materials to public	<input type="checkbox"/> Uncontrolled spread of GMO, communicable or infectious disease to public	<input type="checkbox"/> Natural disaster e.g. earthquake, flood, bushfire
<input type="checkbox"/> Explosion of liquid nitrogen tanks or other tanks that would injure public	<input type="checkbox"/> Loss of radioactive sources that are potentially hazards to students and public	<input type="checkbox"/> Hazardous wastes going into drinking water/public river/public sewage
<input type="checkbox"/> Use of industrial robots or University designed robots	<input type="checkbox"/> Use of VR, AI or emerging technology on experiment participants	<input type="checkbox"/> Provide experiment participants with confronting materials that would cause traumatic events
<input type="checkbox"/> Supply/inject/apply substances (e.g. alcohol, chemical, S4-S9 drugs) to experiment participants	<input type="checkbox"/> Other, please specify:	<input type="checkbox"/>
Duress and Security Stress		
<input type="checkbox"/> Personal life threat e.g. violence behaviour, attacking with knives, guns, clubs, or any type of weapon	<input type="checkbox"/> Personal threat e.g. aggressive behaviour, physical abuse, assault (includes home visits, public interview)	<input type="checkbox"/> Verbal abuse, threat
<input type="checkbox"/> Sexual assault/Raping	<input type="checkbox"/> Throwing objects, pushing, shoving, tripping, grabbing, kicking, hitting	<input type="checkbox"/> Contact with body fluid (e.g. biting, spitting, scratching)

<input type="checkbox"/> Kidnaping in a public location while conducting interviews	<input type="checkbox"/> Unauthorised persons gained access to a building	<input type="checkbox"/> Other, please specify:
Physical/Environmental		
<input type="checkbox"/> Animals (e.g. hazardous wild animals, bees, snakes)	<input type="checkbox"/> Confined space entry (e.g. pit, tank, silo, entry through a hatch)	<input type="checkbox"/> Fall from a height (e.g. ladder, elevated platform, cliff, scaffolding)
<input checked="" type="checkbox"/> Fire (potential for uncontrolled fire due to ignition sources)	<input type="checkbox"/> Flying or moving items/plant/vehicles, falling object(s)	<input type="checkbox"/> Hazardous terrain or environment including wet/slippery surfaces
<input type="checkbox"/> Lighting/visibility is compromised and hazardous	<input type="checkbox"/> Exceedingly strong lighting both natural and artificial	<input type="checkbox"/> Glare and reflections
<input type="checkbox"/> Temperature or weather extremes (e.g. hypothermia, major burns)	<input type="checkbox"/> Difficult to access work site, or a rescue effort would be difficult in the event of an emergency	<input type="checkbox"/> Poor air quality or ventilation at work
<input type="checkbox"/> Insufficient/poor amenities (e.g. toilets, lunch area, breakout area, air-conditioner)	<input type="checkbox"/> Fall on same level (e.g. slip, trip, wet or unstable surface)	<input type="checkbox"/> Other, please specify:
Traffic safety		
<input type="checkbox"/> Lack of separation of vehicles, delivery drivers and pedestrians	<input type="checkbox"/> Lack of physical barriers to prevent interaction between vehicles, delivery drivers and pedestrians	<input type="checkbox"/> Vehicles queue in a way that could create risks to pedestrians, for example crossing walkways or obstructing people's view of vehicles
<input type="checkbox"/> Routes are not wide enough to separate vehicles and pedestrians	<input type="checkbox"/> Vehicles and pedestrians frequently interact	<input type="checkbox"/> Activities done close to public areas (e.g. students coming out from a School building)
<input type="checkbox"/> Certain times of higher traffic volumes or interactions between vehicles, delivery drivers and pedestrians	<input type="checkbox"/> Poor lighting, visibility, shade or glare	<input type="checkbox"/> Potential contact with stationary objects e.g. overhead structures, stationary plant or stored or discarded items.
<input type="checkbox"/> Blind spots at the workplace caused by stationary equipment and vehicles and other areas of poor visibility or low lighting levels	<input type="checkbox"/> Other hazards e.g. noise, emissions or falling objects surrounding the building	<input type="checkbox"/> Pedestrian routes are not designed so pedestrians will not take short cuts
<input type="checkbox"/> Intersections and bottleneck areas around driveways and entrances	<input type="checkbox"/> 'Blind' or convex corners	<input type="checkbox"/> Lack of disabled access to and within a workplace
<input type="checkbox"/> Workers are not aware of insurance policy or emergency procedure on road	<input type="checkbox"/> Lack of maintenance of bikes and cars provided to workers	<input type="checkbox"/> Use of personal vehicle or bikes for work activities
<input type="checkbox"/> Other, please specify:		
Event Specific		
<input type="checkbox"/> Access to the event is restricted/controlled	<input type="checkbox"/> Amenities, including disabled amenities inadequate/insufficient	<input type="checkbox"/> Amusement structures/rides/inflatable structures
<input type="checkbox"/> Animals and wildlife	<input type="checkbox"/> BBQ using gas bottles	<input type="checkbox"/> Children under the age of 18 are part of the event or attending
<input type="checkbox"/> Hit by a vehicle (e.g. moving cars in proximity to pedestrians)	<input type="checkbox"/> Crowding	<input type="checkbox"/> Fatigue e.g. duration of the event, extreme heat
<input type="checkbox"/> Liquor license	<input type="checkbox"/> Medical emergency, difficult to administer or obtain first aid gain assistance e.g. access to medical facilities	<input type="checkbox"/> Scaffolding more than 4m in height
<input type="checkbox"/> Food services and preparation	<input type="checkbox"/> High risk work licence required in accordance with WHS Regs	<input type="checkbox"/> Other, please specify:
High Risk Travel		
<input type="checkbox"/> Risk of kidnaping in this city/region	<input type="checkbox"/> Current civil unrest/political tension	<input type="checkbox"/> Violent crime
<input type="checkbox"/> Threat of attack from bordering nations	<input type="checkbox"/> Heightened risk terrorist attacks can occur	<input type="checkbox"/> Health risks from insect borne disease
<input type="checkbox"/> Health risks from water borne disease	<input type="checkbox"/> Health risks from other infectious disease in the destination countries	<input type="checkbox"/> Threat of assault and sexual assault in foreign countries
<input type="checkbox"/> Travel by some roads restricted due to risks	<input type="checkbox"/> Risk of violence or discrimination based on gender or LGBTI identity	<input type="checkbox"/> Unpredictable and potentially volatile security situation
<input checked="" type="checkbox"/> Other, please specify:		
Working away from campus		
<input type="checkbox"/> Lack of appropriate communication tools/aid	<input type="checkbox"/> Lack of tracking to know where the person is	<input type="checkbox"/> Remote or isolated work locations
<input type="checkbox"/> Use of poorly maintained vehicles or use of personal vehicles	<input type="checkbox"/> Wildlife or animals	<input type="checkbox"/> Traffic accidents while going to or from Campus
<input type="checkbox"/> Duress situations including being threatened by the public	<input type="checkbox"/> Poorly set-up/resourced offsite workspace	<input type="checkbox"/> Social isolation and lack of day to day support
<input type="checkbox"/> Loss of usual health/self-care routines such as exercise and sleep	<input type="checkbox"/> Other, please specify:	
Psychosocial		
<input type="checkbox"/> Environmental – Workplace not compliant with WHS requirements	<input type="checkbox"/> Environmental – Poor air quality, high levels of noise, extreme temperatures	<input type="checkbox"/> Environmental – Lack of WHS consideration for unsafe plant
<input type="checkbox"/> Environmental – Other, please specify:		
<input type="checkbox"/> Organisational – High job demand, long working hours	<input type="checkbox"/> Organisational – High workloads, time pressure, fast work pace	<input type="checkbox"/> Organisational – High emotional effort responding to distressing situations and to aggressive colleagues or students
<input type="checkbox"/> Organisational – Direct exposure to traumatic events at work	<input type="checkbox"/> Organisational – Indirect exposure to traumatic events at work	<input type="checkbox"/> Organisational – Shift work, casual employment, afterhours work, fatigue management
<input type="checkbox"/> Organisational – Frequently working in unpleasant conditions	<input type="checkbox"/> Organisational – Low job demands, too little to do, monotonous tasks	<input type="checkbox"/> Organisational – Low job control

<input type="checkbox"/> Organisational – Poor support, including emotional support, from employer, colleagues and managers	<input type="checkbox"/> Organisational – Workplace bullying, aggression, harassment and sexual harassment, discrimination etc	<input type="checkbox"/> Organisational – Poor relationship between supervisors/line managers and staff or HDR students or other workers
<input type="checkbox"/> Organisational – workplace conflicts	<input type="checkbox"/> Organisational – Perceived or actual lack of fairness, equity and diversity; discrimination against community groups or members (e.g. LGBTQI)	<input type="checkbox"/> Organisational – Low role clarity; uncertainty about changes or frequent changes to tasks and work standards; conflicting job roles
<input type="checkbox"/> Organisational – Poor organisational change management; poor consultation in change management	<input type="checkbox"/> Organisational – Low recognition and reward; low recognition in high WHS performance	<input type="checkbox"/> Organisational – No standardised WHS management practices across the University
<input type="checkbox"/> Organisational – Frequent remote and/or isolated work	<input type="checkbox"/> Organisational – Violent events such as robbery, assault, being threatened by managers, colleagues or managers	<input type="checkbox"/> Organisational- Other, please specify:
<input type="checkbox"/> Individual – innate susceptibility to stress; disabled worker; pre-existing mental and/or physical conditions; age and experience of worker, external stressors eg carer responsibilities, financial situation, relationship status.	<input type="checkbox"/> Teaching – SELT Aggression or abuse towards teaching staff from students	
Other Hazards not listed above		
<input type="checkbox"/> Please identify in the Hazard Profile here and hazards in the form below		

Risk Assessment							
<p>Chemical</p> <p>Flammable – Liquid, Gas, Corrosive – Gas</p> <p>Hazards during storage (e.g. mixed hazards storage, dangerous when wet, temperature sensitive, heat & friction sensitive etc</p> <p>Toxic and health hazard substances</p> <p>Mix two chemicals to form a new chemical</p> <p>Chemical spill – Controlled or uncontrolled</p>	Possible	Major	High (18)	<p>Elimination</p> <p>Substitution</p> <ul style="list-style-type: none"> Only work that can be performed suitable to the lab/office conditions can be performed <p>Isolation</p> <ul style="list-style-type: none"> Access limited to appropriate trained staff/students through Cardex/Salto <p>Engineering</p> <ul style="list-style-type: none"> Interlock access to gases and chemicals Regular Plant/Equipment maintenance Chemicals Stored in ventilated cabinet Fume Cupboards, regular maintenance and inspection Regular inspection of PPE Safety Showers / Eye Wash stations are regularly checked Regular Plant/Equipment maintenance schedule First Aid Equipment on site/location/area <p>Administration</p> <ul style="list-style-type: none"> Risk Assessment specific to ANFF labs is in place. Lab Manager make sure all users implements the protocols approved by HOD Online Booking System to limit number of users at one time Safe Work Procedure for ANFF labs, entry conditions and work/activity are in place. All users need to go through ANFF Induction Process before gaining access to the labs University WHS Induction through the online ANU PULSE Module (Tier 1 Induction)) RSPHys Local Area and School Inductions. This will cover: <ul style="list-style-type: none"> Tier 2 – School/Service Divisional WHS Induction Tier 3 – High Risk Areas Appropriate signs affixed to lab/office doors indicating type of hazards contained within and identified through the Lab/Office Risk Assessment Ensure workers and HDR students who are identified to complete the Tier 2 Compliance Training are enrolled into the training (either in Pulse or face to face) Provide training to anyone working in high risk areas who are identified to do Tier 3 Training in Tier 3 High Risk Areas. Regular review of WHS training appropriate to work/activity Chemical Register up to date (Chemwatch) Validity of Safety data Sheets, SDS. (within 5 years) RSPHys Pre-Purchase checklist for new equipment Chemical storage containers/vessels to be appropriately identified and labelled Ensure workers and HDR students complete their enrolled training as soon as possible and their training completion sent to ohs.physics@anu.edu.au for documentation. All staff to return RSPHys Protocol Confirmation email to ohs.physics@anu.edu.au (COVID-19) <p>PPE</p> <ul style="list-style-type: none"> PPE provided and appropriate to the task/activity Safety Goggles Safety Boots Dust coats and suits where applicable Safety Gloves when appropriate to operation Breathing apparatus when required Face Shields when required for appropriate operation (COVID-19 requirement in some cases) Electrical Safety Mats at machine where required 	Rare	Major	Medium (11)

Work Health and Safety Management System (WHSMS) Handbook

<p>Radiation</p> <p>Exposure to EM Radiations (e.g. X-ray, UV, infrared)</p> <p>Exposure to artificial radiation (e.g. laser)</p>	Likely	Major	Extreme (20)	<p>Elimination</p> <ul style="list-style-type: none"> Eliminate the source of the hazard if possible <p>Substitution</p> <ul style="list-style-type: none"> Only work that can be performed suitable to the lab/office conditions can be performed <p>Isolation</p> <ul style="list-style-type: none"> Access limited to appropriate trained staff through Cardex/Salto No staff permitted unless with lab/supervisor Shielding of laser/radiation source Shutters Installation Use enclosures <p>Engineering</p> <ul style="list-style-type: none"> Interlock access where appropriate Regular Plant/Equipment maintenance/inspection Emergency Stops Regular inspection of PPE Regular Plant/Equipment maintenance schedule Testing and Tagging of plant/equipment First Aid Equipment on site/area/location <p>Administration</p> <ul style="list-style-type: none"> Risk Assessment specific to Lab/Office entry conditions and work/activity. Supervisor/Lab Manager to implement and HOD sign off. Limit numbers of people in a lab at one time (depend on size of lab and whether conditions can be met due to work/activity) Safe Work Procedure appropriate to Lab/Office entry conditions and work/activity. Local Area Workshop Safety Inductions University WHS Induction through the online ANU PULSE Module (Tier 1 Induction)) RSPHys Local Area and School Inductions. This will cover: <ul style="list-style-type: none"> Tier 2 – School/Service Divisional WHS Induction Tier 3 – High Risk Areas Appropriate signs affixed to lab/office doors indicating type of hazards contained within and identified through the Lab/Office Risk Assessment Ensure workers and HDR students under your control who are identified to complete the Tier 2 Compliance Training are enrolled into the training (either in Pulse or face to face) Provide training to anyone working in high risk areas under your control who are identified to do Tier 3 Training in Tier 3 High Risk Areas. Regular review of WHS training appropriate to work/activity RSPHys Pre-Purchase checklist for new equipment Pipes/vessels/containers to be identified and correctly labelled All equipment labelled as per ARPANSA requirements Ensure workers and HDR students complete their enrolled training as soon as possible and their training completion sent to ohs.physics@anu.edu.au for documentation. All staff to return RSPHys Protocol Confirmation email to ohs.physics@anu.edu.au (COVID-19) <p>PPE</p> <ul style="list-style-type: none"> PPE provided and appropriate to the task/activity Laser Safety Goggles (laser specific identification) Safety Boots Dust coats and suits where applicable Hearing Protection Safety Gloves when appropriate to operation Breathing apparatus when required Face Shields when required for appropriate operation (COVID-19 requirement in some cases) Electrical Safety Mats at machine where required 	Rare	Major	Medium (11)
<p>Physical/Environmental</p> <p>Fire (potential for uncontrolled fire due to ignition sources)</p>	Possible	Major	High (18)	<p>Elimination</p> <ul style="list-style-type: none"> Eliminate the source of the hazard if possible <p>Substitution</p> <ul style="list-style-type: none"> Only work that can be performed suitable to the lab/office conditions can be performed <p>Isolation</p> <ul style="list-style-type: none"> Access limited to appropriate trained staff through Cardex/Salto No staff permitted unless with lab/supervisor <p>Engineering</p> <ul style="list-style-type: none"> Implementation of safety protocols through ANU Facilities Division/ANU WHS Division/ANU Security Building Maintenance/schedules through RSPHys Building Custodian and Facilities Division ANU safety protocol through ANU web site. Email and text message alerts for security issues. <p>Administration</p> <ul style="list-style-type: none"> Regular inspection building facilities through ANU WHS/Facilities Ensure workers and HDR students complete their enrolled training as soon as possible and their training completion sent to ohs.physics@anu.edu.au for documentation. All staff to return RSPHys Protocol Confirmation email to ohs.physics@anu.edu.au (COVID-19) <p>PPE</p> <ul style="list-style-type: none"> PPE provided and appropriate to the task/activity 	Rare	Moderate	Low (5)

Actions			
The activity must not be commenced until all controls are in place.			
List below which controls are currently not in place, who will implement them and by when. Add additional rows as needed.			
List of Controls not in place	Who is to implement them?	Timeframe	Date Completed

If the level of residual risk is assessed as high or extreme,

1. Stop the activity immediately; AND
2. Tag out the plant/equipment; and/or
3. Secure any chemical; and
4. Implement, or seek advice from WHS Officer or Subject Matter Experts to implement, additional controls to reduce the residual risk further to medium [Supervisor signature required];
5. If the above is absolutely not possible, seek approval from relevant authority (High – School/Division Director/College Dean; Extreme – COO). **NOTE: Approval will only be granted in exceptional circumstances after consultation with Associate Director, WEG and/or a Subject Matter Expert.** See Chapter 3.1 for details.

Approval required					
Worker conducted RA			Student conducted RA		
Residual Risk Level	Authority required	Signature and date	Residual Risk Level	Authority required	Signature and date
Low	Author of RA		Low	Supervisor	
Medium	Supervisor	<u>Prof. Hoe Tan</u>	Medium	Supervisor	
High	School/Service Division Director College Dean		High	School/Service Division Director College Dean	
Extreme	COO		Extreme	COO	

Table 2.1 Likelihood Table

Ranking	Description	Probability or frequency of event happening
Almost certain	The hazard is expected to lead to an event in most circumstances at the University	A daily to monthly occurrence
Likely	The hazard could lead to an event in most circumstances at the University	Between monthly to yearly occurrence
Possible	The hazard has led to an event at some time at the University	Occurs once between 1 to 5 years
Unlikely	The hazard could lead to an event at some time	Occurs once between 5 to 20 years
Rare	The hazard may lead to an event in exceptional circumstances	Occurs once between 20+ years

Table 2.2 Consequences Table

Ranking	Injury, Illness or Disease	Plant, Equipment and materials	Environment
Catastrophic	Fatality / fatalities or permanent disability. Permanently unable to work	Destroyed or cannot be reused	Long term permanent effect to ecosystems. Significant intervention required to remediate
Major	Requiring extensive medical treatment such as hospitalisation as in patient and possibly a Notifiable Incident LTI >1 week	Damage requiring repairs/rebuild and possible recertification prior to reuse, lost use for one or more days	Notification to environmental agency, ecosystem will need time to recover, intervention required to remediate
Moderate	Minor medical treatment injury, such as treated by a health professional, hospital outpatient, no potential to be a Notifiable Incident LTI < 1 week and can return to normal duties	Damage requiring a repair/service by a trade/technician within the day	Contamination event that does not impact on ecosystem. Short impact does not need intervention
Minor	Injury needing significant first aid treatment and can return to work within shift	Equipment able to be reset or gotten back into operation by the operator	Minor contained contamination ceasing when the short event is over, can remediate (e.g. spill kit)
Insignificant	Report only, no injury OR minor first aid (e.g. bandaid); short-term discomfort	Report only, no damage	Report only, no contamination

Table 3 ANU WHS Risk Matrix

	Insignificant	Minor	Moderate	Major	Catastrophic
Almost certain	Medium (10)	High (14)	Extreme (21)	Extreme (22)	Extreme (25)
Likely	Medium (7)	High (13)	High (16)	Extreme (20)	Extreme (24)
Possible	Low (4)	Medium (9)	High (15)	High (18)	Extreme (23)
Unlikely	Low (2)	Medium (6)	Medium (8)	High (17)	High (19)
Rare	Low (1)	Low (3)	Low (5)	Medium(11)	Medium (12)

Table 4. Hierarchy of Control

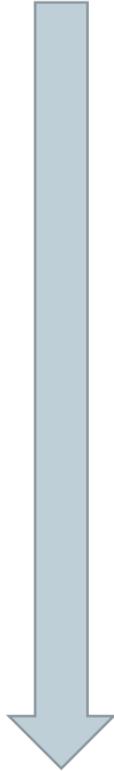
Level	Examples	Effectiveness
Elimination	<ul style="list-style-type: none"> Remove the hazards completely Cease the activity Dispose of unwanted hazardous chemicals or plant etc 	<p style="text-align: center;">Most Effective</p>  <p style="text-align: center;">Least Effective</p>
Substitution	<ul style="list-style-type: none"> Use less hazardous chemicals Use safer plant equipment Use handset instead of telephone Move smaller weight loads instead of large weight 	
Isolation	<ul style="list-style-type: none"> Physical separation from the hazard by distance or complete shielding Install guard rails around edges and holes to floors Move workers to a new room away from hazardous noise 	
Engineering Control	<ul style="list-style-type: none"> Use ventilation system Use fume cupboard when working with hazardous chemicals Install guarding around rotating and crushing parts Use trolley or hoist to lift heavy loads Use duress alarm system while doing home interview or offsite field work 	
Administrative Control	<ul style="list-style-type: none"> Use Safe Work Procedures [See section 3.1.3.1] or instructions Induction and WHS information Training [See Handbook Chapter 3.2] Contingency Planning and Testing [See section 3.1.3.2] Permit to Work system [See section 3.1.3.3] Signage 	
Personal Protective Equipment (PPE)	<ul style="list-style-type: none"> Lab coat Safety glasses/face shield Gloves/cryogenic gloves Respirators/Masks Personal hearing protectors 	

Table 5 Risk Assessment and SWP review timeframe

Use this Table to determine risk assessment and safe work procedure review timeframe and frequency and put in the front of the risk assessment.

Residual Risk	Review Frequency		What to do during the review.
Extreme	6 monthly	And/or	Stop work. Review the control measures and introduce additional control measures to reduce the residual risk to Medium as a maximum.
High	Annually	After an incident where deficiencies in identifying or controlling hazards have been observed	
Medium	Two yearly	When changes to the activity need to occur	Stop work. Review the control measures and introduce additional control measures to reduce the residual risk to Medium as a maximum.
Low	Three yearly	When significant changes (e.g. renovation) to the workplace need to occur	Review the control measures.
		When HSRs request a review	Review the control measures.