

## Chlorine Storage And Handling Risk Assessment

Business Name:		ABN:	
Business Address:			
Contact Person:	Phone:	Email:	

### THIS RISK ASSESSMENT IS APPROVED BY THE PCBU ON THE PROJECT

Under the Work Health and Safety Regulation (WHS Regulation), a person conducting a business or undertaking (PCBU) is required to ensure that a RISK ASSESSMENT is prepared before the proposed work starts.

Full Name:		
Signature:	Title:	Date:

### CLIENT OR PRINCIPAL CONTRACTOR DETAILS

Client:	SCOPE OF WORKS
Project Name:	
Project Address:	
Project Manager:	
Contact Phone:	
Date Risk Assessment supplied to Project Manager:	

RISK MATRIX									
LIKELIHOOD	INSIGNIFICANT	MINOR	MODERATE	MAJOR	CATASTROPHIC	SCORE	ACTION	HIERARCHY OF CONTROLS	
ALMOST CERTAIN	3 HIGH	3 HIGH	4 ACUTE	4 ACUTE	4 ACUTE			<b>Elimination</b> Remove the hazard.	
LIKELY	2 MODERATE	3 HIGH	3 HIGH	4 ACUTE	4 ACUTE	4A ACUTE	DO NOT PROCEED	<b>Substitution</b> Replace the hazard.	
POSSIBLE	1 LOW	2 MODERATE	3 HIGH	4 ACUTE	4 ACUTE	3H HIGH	Review before work starts.	Isolation Isolate People from the hazard	
UNLIKELY	1 LOW	1 LOW	2 MODERATE	3 HIGH	4 ACUTE	2M MODERATE	Ensure control measures in place.	<b>Engineering</b> Isolate the hazard	
RARE	1 LOW	1 LOW	2 MODERATE	3 HIGH	3 HIGH	1L LOW	Monitor and keep records.	<b>Administrative</b> Change	
								<b>PPE</b>	
<b>Risk Rating &amp; Required Action:</b>								<b>Notes on Hierarchy of Controls:</b>	
<b>4A</b> Stop work. The risk is intolerable. Eliminate the hazard or redesign the activity before proceeding. A Safe Work Method Statement (SWMS) or higher-level authorisation is required.								Remember to apply controls in the preferred order shown by the coloured pyramid:	
<b>3H</b> Review and approve additional controls before the task starts. Senior supervisor sign-off needed.								1. <b>Eliminate</b>	
<b>2M</b> Ensure all nominated controls are in place and effective. Proceed with caution; monitor conditions.								2. Substitute	
<b>1L</b> Proceed, following standard operating procedures. Monitor and keep records.								3. Isolate	
								4. Engineering	
								5. Administrative	
								6. PPE	
<b>Consequence Scale:</b>								Always document <b>why</b> a lower-order control is accepted if elimination or substitution is not reasonably practicable.	
Consequence	People (injury/illness)		Project / Assets		Compliance / Reputation				
Catastrophic	Fatality or permanent total disability		project shutdown		Significant regulator intervention; criminal prosecution				
Major	Serious injury/illness (hospital > 5 days)		critical delay		Improvement notice; major media coverage				
Moderate	Medical-treatment injury; lost-time > 1 day		moderate delay		Minor breach; adverse client comment				
Minor	First-aid only, no lost time		negligible delay		Isolated non-conformance				
Insignificant	No injury		no schedule impact		Deviation caught and corrected on site				
								<i>aligned with Safe Work Australia's Managing the risk of fatigue at work (2023) and ISO 45001:2018 clauses 6–8.</i>	

JOB STEP	POTENTIAL HAZARDS	IR	CONTROL MEASURES	RR
SPECIFIC WORK STEPS	HAZARDS THAT MAY ARISE	INITIAL RISK	SPECIFIC MEASURES TO BE PUT IN PLACE TO ELIMINATE OR CONTROL THE RISKS	RESIDUAL RISK
1. Preparation	Chemical exposure, Inadequate training	3H	<ul style="list-style-type: none"> <li>- Conduct safety training sessions for all staff before handling chlorine.</li> <li>- Ensure MSDS (Material Safety Data Sheets) for chlorine are readily available and understood.</li> <li>- Implement a buddy system for new staff handling chlorine for the first time.</li> <li>- Schedule regular refresher courses on chemical safety.</li> <li>- Develop clear communication protocols for emergencies.</li> <li>- Post safety signage prominently at storage and handling locations.</li> <li>- Maintain a roster of trained personnel available at all times.</li> <li>- Limit access to chlorine handling areas to trained personnel.</li> <li>- Check equipment and containers for maintenance issues before use.</li> <li>- Establish a safety checklist that must be completed before beginning work.</li> </ul>	2M
2. Storage Inspection	Container leaks, Inadequate ventilation	3H	<ul style="list-style-type: none"> <li>- Inspect all storage containers for leaks or corrosion regularly.</li> <li>- Ensure ventilation systems are operational and adequate according to safety standards.</li> <li>- Use gas detectors to monitor chlorine levels in storage areas.</li> <li>- Implement routine maintenance checks for all ventilation equipment.</li> <li>- Install automatic shut-off valves to contain leaks.</li> <li>- Clearly label all storage containers with contents and hazard information.</li> <li>- Position storage containers away from heat sources or direct sunlight.</li> <li>- Store chlorine in a well-ventilated, designated area away from incompatible substances.</li> <li>- Provide personal protective equipment (PPE) tailored for chlorine exposure.</li> <li>- Develop an emergency response plan for storage area incidents.</li> </ul>	1L
3. Handling Chlorine Cylinders	Manual handling injury, Cylinder rupture	4A	<ul style="list-style-type: none"> <li>- Use mechanical aids or trolleys for transporting cylinders to prevent manual handling injuries.</li> <li>- Train staff in correct lifting techniques and manual handling procedures.</li> <li>- Regularly inspect all cylinders for signs of wear, damage, or corrosion.</li> <li>- Install cylinder restraints to prevent tipping during storage and handling.</li> <li>- Ensure staff are equipped with appropriate PPE such as goggles and gloves.</li> <li>- Never subject cylinders to excessive heat or physical shock.</li> <li>- Handle cylinders upright and secure them during transport.</li> <li>- Implement a tagging system for identifying cylinders that are safe for use.</li> </ul>	2M

Improper mixing ratios	4A	<p>Set clear paths and signage for transporting cylinders to avoid collisions.</p> <p>Use proper lifting techniques when moving cylinders.</p> <p>Secure cylinders properly during transport.</p> <p>Use appropriate PPE when handling cylinders.</p> <p>Inspect cylinders for damage before use.</p> <p>Store cylinders in a well-ventilated area.</p> <p>Label cylinders correctly.</p> <p>Train personnel on cylinder safety.</p> <p>Establish a cylinder safety protocol.</p> <p>Conduct regular safety drills.</p> <p>Keep emergency equipment accessible.</p> <p>Post safety warnings in the area.</p> <p>Limit access to the cylinder storage area.</p> <p>Use proper storage racks.</p> <p>Check for leaks regularly.</p> <p>Dispose of cylinders properly.</p> <p>Follow local regulations.</p> <p>Keep cylinders upright.</p> <p>Use proper tie-down techniques.</p> <p>Inspect tie-downs regularly.</p> <p>Use proper stacking techniques.</p> <p>Limit the number of cylinders stacked.</p> <p>Use proper handling techniques.</p> <p>Avoid dropping cylinders.</p> <p>Use proper storage containers.</p> <p>Label storage containers.</p> <p>Train personnel on storage procedures.</p> <p>Establish a storage protocol.</p> <p>Conduct regular safety checks.</p> <p>Keep storage area clean.</p> <p>Post safety warnings.</p> <p>Limit access to the storage area.</p> <p>Use proper storage racks.</p> <p>Check for leaks regularly.</p> <p>Dispose of cylinders properly.</p> <p>Follow local regulations.</p> <p>Keep cylinders upright.</p> <p>Use proper tie-down techniques.</p> <p>Inspect tie-downs regularly.</p> <p>Use proper stacking techniques.</p> <p>Limit the number of cylinders stacked.</p> <p>Use proper handling techniques.</p> <p>Avoid dropping cylinders.</p> <p>Use proper storage containers.</p> <p>Label storage containers.</p> <p>Train personnel on storage procedures.</p> <p>Establish a storage protocol.</p> <p>Conduct regular safety checks.</p> <p>Keep storage area clean.</p> <p>Post safety warnings.</p> <p>Limit access to the storage area.</p>
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7. Emergency Preparedness	Delayed response, communication breakdown	3H		1L
8. Transportation of Chlorine	Accident during transport, Cross-contamination	4A		2M

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9. Waste Disposal	Chemical contamination, Improper waste segregation	3H		1L
10. Monitoring and Review	Process deviation, Performance gaps	2M		1L

Correct PPE use

3H

**SAMPLE**

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13. Security Supervision	Unauthorised access, Theft or sabotage	4A		2M
14. Hazardous Event Response	Delayed hazard recognition, Inadequate mitigation measures	4A		2M



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15. Regulatory Compliance Monitoring	Non-compliance, Unaware of regulatory updates	3H		1L
16. Chemical Inventory Management	Inventory mismanagement, Chemical incompatibilities	3H		1L

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17. Staff Wellbeing Programs	Psychological stress, Ergonomic risks	2M	<p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p>	1L
18. Continuous Improvement and Innovation	Stagnant practices, Resistance to change	3H	<p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p>	1L

SAMPLE

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SAMPLE

## EMERGENCY RESPONSE – CALL 000 FOR EMERGENCIES

Ensure to have an Emergency Management Plan in place as well as adequate numbers of trained first aid staff with easy access to fully stocked first aid kits, rescue equipment, material safety data sheets, adequate access to emergency communication equipment and fire-fighting equipment suitable for all classes of fire and ignition sources.

## LEGISLATIVE REFERENCES

RELEVANT LEGISLATION AND CODES OF PRACTICE. DELETE THE LEGISLATIVE REFERENCES IF ANY STATE THAT ARE NOT APPLICABLE

### Queensland & Australian Capital Territory

Work Health and Safety Act 2011

Work Health and Safety Regulations 2011

Legislation QLD: <https://www.worksafe.qld.gov.au/laws-and-compliance/work-health-and-safety-laws>

Codes of Practice QLD: <https://www.worksafe.qld.gov.au/laws-and-compliance/codes-of-practice>

Legislation ACT: <https://www.worksafe.act.gov.au/laws-and-compliance/acts-and-regulations>

Codes of Practice ACT: <https://www.worksafe.act.gov.au/laws-and-compliance/codes-of-practice>

### Victoria

Occupational Health and Safety Act 2004

Occupational Health and Safety Regulations 2017

Legislation VIC: <https://www.worksafe.vic.gov.au/occupational-health-and-safety-act-and-regulations>

Codes of Practice VIC: <https://www.worksafe.vic.gov.au/compliance-codes-and-codes-practice>

### New South Wales

Work Health and Safety Act 2011

Work Health and Safety Regulations 2017

Legislation NSW: <https://www.safework.nsw.gov.au/legal-obligations/legislation>

Codes of Practice NSW: <https://www.safework.nsw.gov.au/resource-library/list-codes-of-practice>

### Western Australia

Work Health and Safety Act 2020

Work Health and Safety Regulations 2022

Legislation Western Australia: <https://www.commerce.wa.gov.au/worksafe/legislation>

Codes of Practice WA: <https://www.commerce.wa.gov.au/worksafe/codes-practice>

### Northern Territory

Work Health and Safety (National Uniform Legislation) Act 2011

Work Health and Safety (National Uniform Legislation) Regulations 2011

Legislation NT: <https://worksafe.nt.gov.au/laws-and-compliance/workplace-safety-laws>

Codes of Practice NT: <https://worksafe.nt.gov.au/laws-and-compliance/codes-of-practice>

### Safe Work Australia Links

Law and Regulation (All States): <https://www.safeworkaustralia.gov.au/law-and-regulation>

Model Codes of Practice: <https://www.safeworkaustralia.gov.au/resources-publications/model-codes-of-practice>

### Model Codes of Practice

- Managing noise and preventing hearing loss at work
- Confined spaces
- Labelling of workplace hazardous chemicals
- Managing risks of hazardous chemicals in the workplace
- Welding processes
- First aid in the workplace
- Managing the risk of falls at workplaces
- Hazardous manual tasks
- Managing the risk of falls in housing construction
- Managing electrical risks in the workplace
- Demolition work
- Excavation work
- Work health and safety consultation, cooperation and coordination
- Managing the work environment and facilities
- How to manage work health and safety risks
- Managing risks of plant in the workplace
- Construction work

### South Australia

Work Health and Safety Act 2012 (SA)

Work Health and Safety Regulations 2012 (SA)

Legislation for SA: <https://www.safework.sa.gov.au/resources/legislation>

Codes of Practice for SA: <https://www.safework.sa.gov.au/workplaces/codes-of-practice#COPs>

### Tasmania

Work Health and Safety Act 2012

Work Health and Safety (Transitional and Consequential Provisions) Act 2012

Work Health and Safety Regulations 2012

Work Health and Safety (Transitional) Regulations 2012

Legislation for TAS: <https://worksafe.tas.gov.au/topics/laws-and-compliance/acts-and-regulations>

Codes of Practice for TAS: <https://worksafe.tas.gov.au/topics/laws-and-compliance/codes-of-practice>

Details of permits, licenses or access required by regulatory bodies (add or delete as required):

- Permits from local council
- Authorisation to commence work
- Any required documents.