Water Treatment Plant			
Business Name:		ABN:	
Business Address:			
Contact Person:	Phone:	Email:	

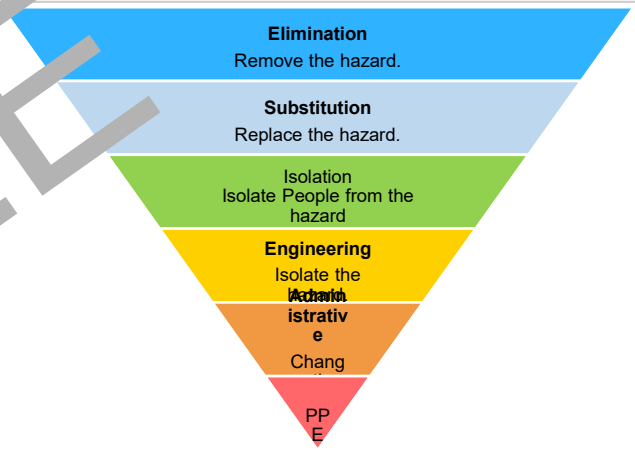
THIS RISK ASSESSMENT IS APPROVED BY THE PCBU OF THE PROJECT		
Under the Work Health and Safety Regulation (WHS Regulation), a person conducting a business or undertaking (PCBU) is required to ensure that a RISK ASSESSMENT is prepared before the proposed work starts.		
Full Name:		
Signature:	Title:	Date:

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
ALMOST CERTAIN	3 HIGH	3 HIGH	4 ACUTE	4 ACUTE	4 ACUTE		
LIKELY	2 MODERATE	3 HIGH	3 HIGH	4 ACUTE	4 ACUTE	4A ACUTE	DO NOT PROCEED
POSSIBLE	1 LOW	2 MODERATE	3 HIGH	4 ACUTE	4 ACUTE	3H HIGH	Rev before work
UNLIKELY	1 LOW	1 LOW	2 MODERATE	3 HIGH	4 ACU	2M MO RATE	Ensure control measures in place.
RARE	1 LOW	1 LOW	2 MODERATE	3 HIGH	3 H	1L LOW	Monitor and keep records.

HIERARCHY OF CONTROLS



Risk Rating & Required Action:

4A	Stop work. The risk is intolerable. E inate the hazar redesign the activity before proceeding. A Safe Work Method Statement (SWMS) or hi er-level authorisati is required.
3H	Review and approve additional c rols b ask arts. Senior supervisor sign-off needed.
2M	Ensure all nominated controls are in ace and effe ive. Proceed with caution; monitor conditions.
1L	Proceed, following standard operating procedures Monitor and keep records.

Consequence Scale:

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

Notes on Hierarchy of Controls:
Remember to apply controls in the preferred order shown by the coloured pyramid:

1. **Eliminate**
2. Substitute
3. Isolate
4. Engineering
5. Administrative
6. PPE

Always document **why** a lower-order control is accepted if elimination or substitution is not reasonably practicable.

aligned with Safe Work Australia's Managing the risk of fatigue at work *(2023) and ISO 45001:2018 clauses 6–8.*

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. Governance, WHS Leadership and Due Diligence	• Lack of clear WHS governance structure for multiple water treatment facilities and activities (drinking water, wastewater, recycled water, sludge ponds) • Officers not exercising due diligence as required under WHS Act 2011 (no active monitoring of plant WHS performance) • Insufficient allocation of resources for WHS (staffing, competent supervision, budget for controls and maintenance) • Inadequate integration of WHS into corporate risk management and asset management frameworks • Poor safety culture leading to under-reporting of incidents and hazards • Unclear accountability for WHS across operators, contractors, consultants and joint venture partners	4A	• Establish a formal WHS governance framework endorsed by the Board/Executive that clearly defines roles, responsibilities and reporting lines for all water treatment operations • Ensure officers comply with WHS Act 2011 due diligence duties through regular WHS briefings, documented site visits and review of WHS performance indicators for all plants • Integrate WHS risk into corporate risk register and asset management plans, including specific entries for water treatment, sludge management, recycled water schemes and wastewater reclamation • Implement a documented WHS policy and safety management system aligned to ISO 45001, with specific procedures for water and wastewater treatment activities • Set measurable WHS objectives and KPIs (e.g. lead indicators such as inspections, close-out rate of actions, training completion) and review these at senior leadership meetings • Create an annual WHS improvement plan for water treatment operations, resourced and tracked to completion • Conduct periodic independent WHS audits of treatment plants and recycled water facilities, with findings reported to officers and actioned within agreed timeframes • Establish a clear governance process for contractor management, including WHS performance requirements embedded in contracts and regular performance reviews	3H
2. WHS Risk Management and Change Management Systems	• Inconsistent identification and assessment of WHS risks across different treatment plants and processes • No systematic review of risks associated with new technologies (e.g. membrane bioreactors, UV systems, chemical dosing upgrades, freshwater generators) • Poor management of change (MOC) when modifying treatment processes, sludge pond configurations, or introducing recycled water schemes • Failure to consider cumulative risks (e.g. chemical, biological, confined space and electrical hazards occurring concurrently) • Risk assessments not reviewed following incidents, near misses or process changes	4A	• Implement a documented WHS risk management procedure consistent with WHS Regulations and relevant codes of practice, covering all water treatment, wastewater, sludge, and recycling operations • Standardise risk assessment tools and matrices across all facilities, with clear guidance on likelihood, consequence and risk rating (e.g. 1L–4A scale) • Establish a formal Management of Change (MOC) procedure requiring WHS risk assessment, consultation and approval for any plant or process change, including introduction of new chemicals or treatment streams • Require multidisciplinary risk workshops for significant projects or modifications (engineering, operations, maintenance, WHS, environmental, process engineering) • Ensure all SWMS and task-level procedures are linked to this higher-level system risk assessment and reviewed at defined intervals • Mandate post-incident and post-commissioning reviews of risk controls, with documented learnings applied across all sites • Maintain a central risk register for systemic WHS risks (e.g. chlorine gas systems, biogas handling, sludge pond access, recycled water distribution) with assigned owners and review dates	2M
3. Plant, Equipment and Asset Integrity Management	• Failure of critical treatment plant assets (clarifiers, filters, membranes, UV systems, blowers, sludge pumps)	4A	• Maintain an asset management system that identifies all critical plant and equipment across water, wastewater, recycling and sludge operations, with risk-based inspection and maintenance strategies	2M

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
	leading to uncontrolled releases or exposure to hazards • Inadequate inspection and maintenance of high-risk plant (pressure vessels, chemical storage tanks, gas chlorination systems, freshwater generators) • Ageing infrastructure in wastewater treatment plants and sludge ponds (corroded access platforms, unstable handrails, degraded walkways) • Inadequate design of plant for safe access (poorly located valves, lack of guarding, unsafe access to screens and mixers) • Uncontrolled energisation of equipment during maintenance due to ineffective isolation and lock-out systems • Failure of remote and automated systems (SCADA, telemetry) without robust backup or manual override procedures		• Ensure all plant is designed, registered (where required) and maintained in accordance with WHS Regulations, Australian Standards and OEM requirements • Implement a documented preventive maintenance program for high-risk assets (e.g. chlorination systems, pressure vessels, UV units, chemical dosing skids, freshwater generators), with compliance monitored through CMMS reports • Standardise guarding and access design (guardrails, platforms, fixed ladders, non-slip surfaces) for tanks, clarifiers, screens, sludge ponds and elevated structures, following relevant Australian Standards • Establish a lock-out tag-out (LOTO) and isolation procedure for all maintenance tasks, supported by isolation registers and periodic verification audits • Introduce pre-start and condition checklists for key plant items (screens, blowers, pumps, cranes, vehicles) with escalation processes for defects • Ensure SCADA and control systems have redundancy, alarm management protocols and documented manual override procedures, with operators trained in failure modes • Plan for periodic plant condition assessments and structural inspections of tanks, bunds, walkways and sludge containments by competent engineers	
4. Process Safety and Chemical Management	• Loss of containment of hazardous chemicals (chlorine gas, sodium hypochlorite, aluminium, caustic soda, acids, polymers, coagulants) at water and wastewater plants • Inadequate engineering controls for gas chlorination, disinfection by-products, and odour control systems • Incorrect chemical dosing or incompatible chemical storage leading to toxic releases, corrosion or violent reactions • Deficient chemical delivery and transfer procedures (no spill containment, poor hose management, no verification of correct tank) • Inadequate ventilation and gas detection in enclosed dosing rooms or chemical storage areas	4A	[redacted]	2M

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
	• Poor labelling and Safety Data Sheet (SDS) management across multiple treatment sites and mobile operations		[redacted]	
5. Biological, Water Quality and Public Health Risk Management	• Exposure of workers to biological agents in wastewater, sludge ponds, recycled and non-potable water (pathogens, aerosols, biofilms) • Inadequate barriers and process controls leading to contamination of drinking water supply • Failure of disinfection or treatment processes (chlorination, UV, filtration, freshwater generators) due to poor monitoring or maintenance • Insufficient management of cross-connections between potable, recycled and non-potable systems • Lack of integration between WHS, water quality and public health risk management framew[redacted]	4A	[redacted]	2M
6. Confined Spaces, Tanks and Sludge Pond Access Management	• Uncontrolled entry into confined spaces (tanks, pits, wet wells, valv[redacted] chambers, sludge thicker[redacted]) without proper risk assessment and entry permits • Atmospheric hazards (oxygen deficiency, toxic gases such as H2S, methane) in wastewater treatment and sludge handling areas • Unstable edges, embankments and soft ground conditions around sludge ponds and lagoons leading to engulfment or falls • Inadequate rescue capability for incidents in confined spaces or around ponds	4A	[redacted]	2M

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
	• Poor control of contractor works in confined spaces and lagoons		[redacted]	
7. Electrical Safety, Instrumentation and Control Systems	• Exposure to live electrical parts during maintenance of pumps, blowers, UV systems, control panels and freshwater generators • Inadequate earthing and bonding in corrosive water and wastewater environments • Failure of instrumentation and control systems leading to unsafe operating conditions (e.g. over-pressurisation, overdosing, tank overflows) • Uncontrolled work on energised SCADA, telemetry and communication equipment • Use of non-compliant electrical equipment in hazardous areas (e.g. around biogas, flammab[redacted]micals)	3H	[redacted]	2M
8. Traffic, Mobile Plant and Materials Handling	• Vehicle and mob[redacted]plant int[redacted]s with pedestrians at [redacted] plants, sludge ponds and recycling facilities • Uncontrolled movements of tan[redacted]s delivering chemicals or re[redacted]g sludge and biosolids • Poorly planned access routes for maintenance vehicles, cranes and vacuum trucks near open water and unstable edges • Manual handling of heavy equipment, valves, sample containers and water testing equipment without mechanical aids • Lack of consistent traffic control and signage across multiple remote sites	3H	[redacted]	2M

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
			[redacted]	
9. Contractor, Alliance Partner and Visitor WHS Management	• Contractors performing high-risk work (confined spaces, electrical, working at heights, sludge handling) without adequate WHS systems • Inconsistent induction and supervision of visiting specialists, auditors, regulators and project staff • Multiple contractors working simultaneously (e.g. plant upgrades, lagoon desludging, recycled water plant commissioning) without coordination • Inadequate verification of licences, competencies and insurances • Poor communication of site-specific hazards such as chemical systems, reclaimed water uses and sludge pon	3H	[redacted]	2M
10. Training, Competency and Supervision	• Operators, maintenan[redacted]onnel and laboratory staff not [redacted]mpetent in complex treatment [redacted]rocesses and associated WHS r[redacted]s • Insufficient training in chemical handling, biological hazards, confin[redacted] space entry, sludge pond [redacted]asks[redacted] wastewater reclamation op[redacted]ations • Supervisors lacking skills to manage WHS, lead incident investigations and enforce procedures • Inadequate competency assessment for new technologies (e.g. advanced membrane filtration, UV disinfection, automation systems, freshwater generators) • Failure to maintain training records and expiry dates for licences and high-risk work authorisations	3H	[redacted]	2M

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
11. Fatigue, Remote and Isolated Work, and Psychosocial Risks	• Fatigue resulting from shift work, on-call rosters and after-hours response to water quality or plant alarms • Workers operating alone at remote treatment plants, sludge ponds or pumping stations without reliable communication or check-in systems • Psychosocial hazards arising from high regulatory and public health responsibility, incident investigations and community complaints • Exposure to aggressive behaviour from members of the public during site visits, odour complaints or recycled water scheme discussions	3H	[redacted]	1L
12. Emergency Preparedness and Incident Management	• Inadequate preparation for major incidents such as chemical spills, gas releases, treatment plant failures, sludge pond breaches or contamination events • Poor integration between site emergency plans and local emergency services for water and wastewater treatment facilities • Lack of drills for scenarios involving hazardous chemicals, confined spaces, rescues from ponds or large-scale plant outages • Ineffective incident reporting and investigation systems leading to repeat events • Failure to notify regulators and stakeholders in accordance with legislative requirements	4A	[redacted]	2M
13. Documentation, Information Management and Record Keeping	• Critical WHS and process safety information (procedures, P&IDs, SDS, risk assessments, permits) not controlled or accessible to workers	3H	[redacted]	1L

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
	• Outdated documentation used for operating advanced treatment processes or freshwater generators • Inadequate record keeping for inspections, maintenance, training, incidents and compliance obligations • Poor integration of WHS information across multiple systems (SCADA logs, CMMS, document control, training databases)		[redacted]	
14. Consultation, Worker Engagement and Continuous Improvement	• Lack of structured consultation with operators and maintenance staff on WHS issues, system changes and new projects • Low worker engagement leading to unreported hazards, near misses and unsafe practices becoming normalised • Suggestion and improvement mechanisms not linked to actual change or feedback, creating cynicism and disengagement • Inconsistent operation of health and safety committees across treatment plants and depots	2M	[redacted]	1L

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 FOR 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

New South Wales
Work Health and Safety Act 2011
Work Health and Safety Regulations 2025
Legislation NSW: https://www.safework.nsw.gov.au/legal-obligations/legislation
Codes of Practice NSW: https://www.safework.nsw.gov.au/resource-library/list-of-codes-of-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/forms-and-resources/codes-of-practice

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.

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

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

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