

Mining Gas Extraction and Hydraulic Fracturing

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

THIS RISK ASSESSMENT IS APPROVED BY THE PCBU ON THIS 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			Elimination Remove the hazard.	
LIKELY	2 MODERATE	3 HIGH	3 HIGH	4 ACUTE	4 ACUTE	4A ACUTE	DO NOT PROCEED	Substitution 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.	Engineering Isolate the hazard	
RARE	1 LOW	1 LOW	2 MODERATE	3 HIGH	3 HIGH	1L LOW	Monitor and keep records.	Administrative Change	
								PPE	

Risk Rating & Required Action:	
4A	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.
3H	Review and approve additional controls before task starts. Senior supervisor sign-off needed.
2M	Ensure all nominated controls are in place and effective. 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, Legal Compliance and WHS Due Diligence	<ul style="list-style-type: none"> Inadequate understanding and application of WHS Act 2011 and WHS Regulation requirements to coal seam gas and hydraulic fracturing operations Lack of clear WHS governance structure and accountability from Board through to site leadership Failure to incorporate Safety in Design and hierarchy of control into project approvals and major change decisions Inadequate processes to identify and comply with overlapping duties (PCBU to PCBU, principal contractor, labour hire, subcontractors) Insufficient WHS reporting, leading and lagging indicators to verify effectiveness of the WHS management system Poor integration of environmental approvals, petroleum and gas legislation and land access conditions with WHS obligations Failure to consult with workers and other duty holders on major WHS risks related to gas extraction and re-stimulation projects 	4A	<ul style="list-style-type: none"> Establish and document a WHS governance framework that defines roles, responsibilities and due diligence duties for officers in line with WHS Act 2011 Develop a compliance register mapping all applicable WHS, petroleum, environmental, dangerous goods and land access legislation and ensure periodic legal review by competent advisors Implement a formal Safety in Design procedure for all new wells, re-stimulation projects and hydraulic fracturing campaigns, including independent design review and risk workshops Define and resource the role of principal contractor and clarify interfaces with other PCBUs through written WHS coordination and cooperation agreements Implement a WHS management system aligned with ISO 45001, including policy, risk management procedures, objectives, targets and continuous improvement processes Establish leading and lagging WHS performance indicators (e.g. critical control verification, process safety events, near misses, contractor performance) and report regularly to senior management Engage in formal WHS consultation, cooperation and coordination procedure covering workers, contractors, landholders and other PCBUs involved in coal seam gas and hydraulic fracturing activities Undertake periodic independent WHS and process safety audits covering governance, critical controls and legal compliance, with action tracking through to closure 	3H
2. Safety Leadership, Culture and Worker Engagement	<ul style="list-style-type: none"> Management emphasis on production and schedule over safety in drilling completions and fracturing operations Normalisation of deviance where unsafe practices become accepted (e.g. bypassing controls, informal procedures) Insufficient mechanisms for workers and contractors to report hazards, near misses and safety concerns without fear of reprisal Poor integration of contractor workforce into site safety culture and communication channels Lack of learning from incidents, process safety events and high-potential near misses across projects and sites 	3H	<ul style="list-style-type: none"> Implement a documented safety leadership program for supervisors and managers with a focus on process safety, field presence and quality of safety interactions Set explicit safety performance expectations and WHS KPIs for all leadership roles, integrated into performance reviews and incentives Establish a confidential and accessible hazard and near-miss reporting system, with clear feedback loops and visible close-out of actions Conduct regular leadership field visits and safety walks with structured observation tools focused on critical controls and high-risk activities Integrate contractors into pre-start meetings, toolbox talks and safety campaigns, ensuring two-way communication and participation Implement a formal lessons-learned process following incidents, high-potential events and industry alerts, with documented actions and verification of implementation across all CSG and fracturing sites Conduct periodic safety culture surveys and focus groups to identify cultural barriers and track improvement over time 	2M

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3. Contractor and Supply Chain Management	<ul style="list-style-type: none"> Use of drilling, completions and hydraulic fracturing contractors whose WHS systems are inadequate or not equivalent to principal PCBU standards Gaps between client and contractor procedures resulting in confusion about which systems apply on site Pressure on contractors from commercial arrangements that may incentivise corner-cutting or excessive work hours Inadequate pre-qualification of specialist service providers (e.g. wireline, pumping services, chemical suppliers, transport) for high-risk operations Lack of verification that critical equipment provided by contractors meets Australian Standards and site specifications Poor management of subcontractors and labour hire personnel by primary contractors 	4A	<ul style="list-style-type: none"> Implement a tiered contractor WHS pre-qualification and onboarding process that assesses management systems, competency, equipment standards and process safety capability Include explicit WHS requirements, performance expectations and right-to-intervene clauses in contracts for drilling, completions and fracturing services Align contractor and client procedures through interface workshops prior to mobilisation, documenting a bridging plan that specifies which systems apply for each risk area Require critical contractors to operate a certified WHS management system (e.g. ISO 45001) or demonstrate equivalence, with periodic auditing by the principal PCBU Specify minimum engineering and safety standards for contractor-supplied equipment (e.g. pressure ratings, safe work guards, emergency shutdown systems) and verify via inspections and documentation review Monitor contractor WHS performance using agreed KPIs, joint inspections and regular contract review meetings focused on safety and process safety outcomes Ensure primary contractors have documented processes to manage their subcontractors and labour hire workers, including induction, supervision and competency verification 	3H
4. Competency, Training and Authorisation Systems	<ul style="list-style-type: none"> Inadequate competency of personnel performing high-risk tasks such as well control, high-pressure pumping, wireline operations and gas monitoring Reliance on informal on-site training without formal assessment against competency standards Training not tailored to risks specific to coal seam gas extraction, direct re-stimulation and hydraulic fracturing activities No systematic verification of licences, high risk work permits and professional qualifications for relevant roles Insufficient refresher training for emergency response, well control and process safety critical roles 	4A	<p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p>	2M

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	<ul style="list-style-type: none"> Language, literacy or cultural barriers reducing effectiveness of training and communication for a diverse workforce 		[REDACTED]	
5. Well Design, Integrity and Lifecycle Management	<ul style="list-style-type: none"> Inadequate well design for geological conditions leading to loss of well integrity, blowouts or gas migration Failure of casing, cementing or packers due to poor design verification, construction quality or monitoring Insufficient assessment of legacy wells and previous stimulation history prior to direct re-stimulation projects Inadequate barriers and isolation between coal seams, aquifers and surface, increasing risk of contamination or uncontrolled gas flow Lack of structured well integrity management system across design, drilling, completion, production and abandonment phases Poor record-keeping of well construction, modification and pressure tests 	4A	[REDACTED]	2M
6. Process Safety and High-Pressure System Management	<ul style="list-style-type: none"> Over-pressurisation of wellbore, lines or frac equipment leading to catastrophic failure and release of gas or fluids Inadequate design and maintenance of pressure relief, emergency shutdown and interlock systems Failure of temporary surface piping, manifolds and connections used for fracturing and flowback operations Poor control of simultaneous operations (SIMOPS) involving drilling, fracturing, wireline, coiled tubing, lifting and vehicle movements Uncontrolled gas release during perforation, flowback, well clean-up or equipment change-out 	4A	[REDACTED]	2M

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	<ul style="list-style-type: none"> Inaccurate or failed pressure, flow and gas detection instrumentation 		[REDACTED]	
7. Hazardous Chemicals, Fracturing Fluids and Waste Management	<ul style="list-style-type: none"> Exposure of workers to hazardous chemicals in fracturing fluids, proppants and additives via inhalation, skin contact or ingestion Inadequate assessment and control of chemical compatibility, reactions or degradation products under downhole conditions Spills or leaks of chemicals, produced water or flowback fluids impacting workers and environment Inadequate segregation, labelling and storage of hazardous substances on well pads and in laydown yards Poor management of waste streams (e.g. drill cuttings, contaminated soils, filter media, used chemicals) creating ongoing health and environmental risks Insufficient disclosure and communication of chemical hazards to workers, regulators and affected landholders 	4A	[REDACTED]	2M
8. Groundwater, Gas Migration and Environmental Interface Risks	<ul style="list-style-type: none"> Uncontrolled migration of gas into groundwater or to surface due to inadequate isolation or failure of well barriers Induced fractures intersecting other wells or preferential pathways leading to gas or fluid migration Inadequate baseline and ongoing groundwater monitoring to detect changes associated with CSG extraction or re-stimulation Insufficient integration between environmental management plans and 	3H	[REDACTED]	2M

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	<ul style="list-style-type: none"> WHS risk controls on well pads and gathering systems Community and landholder concern or opposition escalating into psychosocial risks for workers and conflict at worksites 		[REDACTED]	
9. Land Access, Community and Regulatory Stakeholder Management	<ul style="list-style-type: none"> Poorly managed land access negotiations leading to hostility, protest or obstruction at sites Failure to comply with land access conditions, biosecurity requirements or agreed activity plans Inadequate management of community complaints, concerns or misinformation about hydraulic fracturing and CSG risks Regulatory non-compliance or poor communication with petroleum, environment and WHS regulators Psychosocial stress for workers arising from conflict with landholders or community activists 	3H	[REDACTED]	2M
10. Remote and Isolated Work, Fatigue and Labour Planning	<ul style="list-style-type: none"> Workers operating in remote locations with delayed emergency response and limited access to medical services Fatigue arising from long shifts, night work, camp rosters and travel to and from isolated CSG and fracturing sites Inadequate journey management and road risk controls for travel between camps, depots and well pads Insufficient systems to monitor lone workers or small crews during night operations, well testing and flowback monitoring Workforce planning not adequately resourced for peak fracturing campaigns, resulting in overtime and excessive work hours 	3H	[REDACTED]	2M

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11. Traffic, Mobile Plant and Well Pad Layout Management	<ul style="list-style-type: none"> • Congested well pads with multiple heavy vehicles, cranes, frac pumps, chemical tankers and light vehicles operating simultaneously • Poor segregation of pedestrian, light vehicle and heavy plant movements on pads and access tracks • Inadequate design of pad layout, access roads and parking leading to vehicle conflicts and restricted emergency access • Uncontrolled third-party access to operational areas (e.g. landholders, visitors, inspectors) without adequate briefing or controls • Improper lifting planning and management for rig up/rig down, coil units and heavy component handling 	3H	[REDACTED]	2M
12. Permit to Work, Isolation and Confined Space Systems	<ul style="list-style-type: none"> • Failure to adequately isolate wells, lines, vessels or electrical systems prior to maintenance, intervention or modification work • Incomplete or ineffective permit to work systems for hot work, working at height, confined space and invasive activities • Uncontrolled re-pressurisation or ingress into work areas during maintenance or re-stimulation preparation • Confined space risks in tanks, separators, pits or enclosed process equipment associated with CSG and fracturing operations • Informal bypassing or normalisation of deviations from isolation and permit systems under time pressure 	4A	[REDACTED]	2M
13. Emergency Preparedness, Response and Crisis Management	<ul style="list-style-type: none"> • Inadequate planning and resourcing for credible emergency scenarios such as well control incidents, gas releases, fires, vehicle rollovers or medical events • Emergency response plans not tailored to remote CSG and fracturing locations, 	4A	[REDACTED]	2M

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	<ul style="list-style-type: none"> actual workforce composition and contractor arrangements Lack of coordination between operator, contractors, emergency services, regulators and landholders during incidents Insufficient drills and exercises to test readiness for well control, site evacuation and mass casualty scenarios Poor communication systems and redundancy for use during emergencies 		[REDACTED]	
14. Health Monitoring, Occupational Hygiene and Psychosocial Risks	<ul style="list-style-type: none"> Chronic exposure to noise, silica, diesel emissions, chemical vapours or other airborne contaminants at drilling and fracturing sites Inadequate health monitoring for workers exposed to hazardous substances in fracturing fluids, production gas and flowback operations Psychosocial hazards including remoteness, work isolation, long hours, job insecurity and exposure to community hostility Insufficient management of heat stress, cold stress or weather-related health impacts for outdoor workers Inadequate integration of occupational health considerations into contractor management systems 	2M	[REDACTED]	2M
15. Information Management, Documentation and Change Control	<ul style="list-style-type: none"> Outdated or conflicting procedures and technical documents in circulation across multiple CSG and hydraulic fracturing sites Informal changes to frac designs, pump schedules, chemicals or well operating envelopes without formal review Loss or fragmentation of critical well and process safety information across different contractors and data systems 	3H	[REDACTED]	2M

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	<ul style="list-style-type: none"> Inadequate communication of changes in risk controls, lessons learned or new regulatory requirements to field personnel Failure to capture operational learnings from re-stimulation campaigns and apply them to future projects 		<div style="background-color: black; height: 15px; width: 100%;"></div> <div style="background-color: black; height: 15px; width: 100%;"></div> <div style="background-color: black; height: 15px; width: 100%;"></div>	

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 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>

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 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-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) Regulation 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>

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>

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

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.