Quarry Excavation

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:

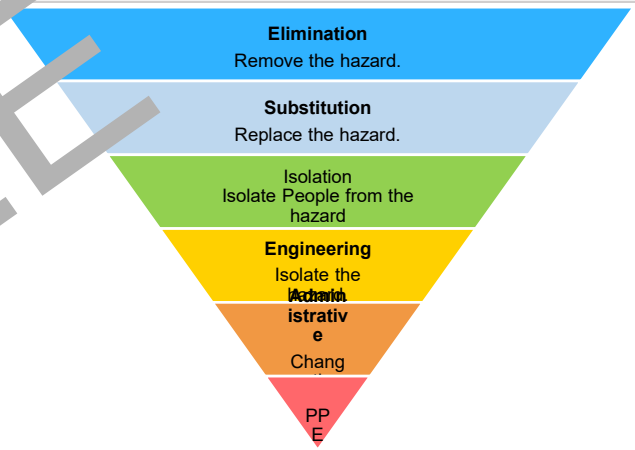
CLIENT OR PRINCIPAL CONTRACTOR DETAILS

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, Legal Compliance and PCBUs Interface	• Failure to identify and comply with WHS Act 2011, WHS Regulations and relevant mining and explosives legislation for quarrying and blasting • Unclear allocation of WHS duties between PCBUs (quarry owner, blasting contractor, haulage contractors, maintenance providers) • Inadequate consultation, cooperation and coordination arrangements with external PCBUs (e.g. explosives supplier, drill and blast contractors) • Absence of a formalised safety management system (SMS) for quarry and blasting operations • Poor change management when introducing new equipment, blasting methods, or production targets • Inadequate incident reporting, notifiable incident management and regulator liaison processes	High	• Establish and maintain a documented WHS management system aligned with WHS Act 2011, WHS Regulations and applicable state/territory mining and explosives legislation and codes of practice • Clearly define PCBUs roles, responsibilities and consultation arrangements in written agreements, including specific duties for blasting design, explosives storage, transport, initiation and post-blast clearance • Implement a formal governance structure (e.g. WHS committee, senior management review meetings) that regularly reviews quarry and blasting risk profiles, incidents and legal compliance status • Develop and maintain a legal register covering WHS, mining, environmental and explosives requirements and assign responsibility for monitoring legislative changes • Implement a documented management of change procedure for alterations to blast patterns, production rates, quarry design, plant, processes, and workforce structure, including risk review and consultation • Establish formal consultation framework with workers and contractors (toolbox talks, pre-blast coordination meetings, safety committees) including specific focus on blasting activities • Implement a standardised incident, near-miss and hazard reporting system, including triggers for regulator notification in line with notifiable incident requirements • Conduct periodic external and internal WHS compliance audits, including blasting and explosives management, and track corrective actions to completion	Medium
2. Quarry and Blast Planning, Design and Geotechnical Management	• Inadequate mine/quarry design resulting in unstable faces, benches and highwalls during and after blasting • Insufficient geotechnical assessment of rock mass, jointing, faults and groundwater conditions influencing blast outcomes and slope stability • Poor integration of blast design with overall quarry development plan, haul road layout and stockpile locations • Inadequate consideration of vibration, airblast, flyrock and overpressure impacts on neighbouring properties, infrastructure and the public • Failure to plan for progressive rehabilitation and long-term stability of excavated slopes and final void • Inaccurate survey data and blast modelling leading to mis-located drill	High	• Develop a formal quarry design and planning document prepared or reviewed by a competent mining/geotechnical engineer, including benches, haul roads, face angles, berms and final wall configuration • Undertake regular geotechnical assessments of quarry faces, benches and highwalls, including documented hazard mapping and slope stability assessments before major blasts • Ensure blast design is completed or verified by a competent blasting engineer or shotfirer, using current survey data and modelling to control burden, spacing, charge weights and initiation sequence • Integrate drilling and blasting plans into the overall quarry development plan, with clear design criteria for bench heights, catch berms, exclusion zones and access control points • Establish blast impact assessments covering vibration, airblast and flyrock analysis, and maintain monitoring and complaint-handling procedures for neighbouring properties and infrastructure • Implement strict survey and mark-up procedures using qualified surveyors and calibrated equipment to verify blast hole locations, patterns and exclusion zones • Develop and review ground control management plans and design criteria for stability, including triggers for review after abnormal blasts, heavy rainfall or geotechnical incidents • Plan progressive rehabilitation and final landform outcomes, ensuring that changes to quarry design or blasting approach are subject to geotechnical and WHS risk review	Medium

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
	patterns, poor burden and spacing, and increased risk of misfires or flyrock			
3. Contractor, Explosives Provider and Specialist Engagement	• Engagement of blasting, drilling and transport contractors without adequate competency assessment or WHS due diligence • Misalignment between quarry operator's WHS systems and contractor procedures, leading to gaps in control implementation • Lack of clarity on who controls critical blasting decisions (blast design, exclusion zones, firing time, all-clear) • Inadequate verification of licences, permits and insurances for explosives handling, storage and transport • Insufficient performance monitoring of contractors, including non-conformance with quarry safety rules and blasting management plans	High	• Implement a formal contractor management system requiring WHS prequalification, including evidence of blasting competence, licences, training records and incident history • Include clear WHS and blasting safety requirements in contracts, including adherence to site-specific procedures, quarry rules and explosives management plans • Define and document roles, responsibilities and authorities for blasting decisions between the quarry operator and contractor shotfirer, including final authority to fire and to abort blasts • Maintain a verification process for licences, permits, insurances and competency for all personnel involved in drilling, blasting, explosives transport and storage • Conduct formal mobilisation and site induction processes for new contractors, including review of site-specific blast hazards, emergency procedures and communication protocols • Establish key performance indicators, periodic reviews and audits of contractor WHS performance, including participation in incident investigations and corrective actions • Require contractors to provide method statements and risk assessments that are reviewed and integrated with the quarry's WHS management system before work commences	Medium
4. Risk Management, Procedures and Permit Systems	• Absence of formal, written risk assessments for quarry excavation and blasting activities at the system level • Outdated or inconsistent safe procedures for blast excavation and associated traffic management • Lack of risk-based permit to work systems for high-risk blasting interfaces (e.g. hot work near explosives, working at heights on benches, confined spaces in voids or plant) • Inadequate review of risks associated with abnormal conditions (e.g. misfires, adverse weather, unstable slopes, water-filled holes) • Failure to integrate lessons learned from incidents, near misses and complaints into updated risk controls and procedures	High	[redacted]	Medium

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
5. Training, Competency and Supervision	• Inadequate verification of competency for quarry managers, supervisors, drillers, shotfirers and mobile plant operators • Insufficient training on blasting hazards, exclusion zones, misfire management and vibration/airblast impacts for general workforce and contractors • Lack of ongoing refresher training and skills maintenance for key roles, including emergency response and first aid • Poor supervisory oversight of high-risk areas such as blast preparation, face excavation and traffic interfaces • Language, literacy and numeracy barriers leading to misunderstanding of procedures and signage	High	[redacted]	Medium
6. Explosives Procurement, Transport, Storage and Inventory Control	• Improper procure[illegible]ent proces[illegible] for explosives and det[illegible]tors[illegible]uding suppliers without adequate safety systems • Non-compliant transpor[illegible]ments for explosives to and from the quarry site • Inadequate secure storage, segregation and environmental controls for explosives and initiating systems • Poor inventory tracking leading to loss, theft or unexplained discrepancies of explosives and detonators • Failure to manage shelf life, degradation and compatibility of explosives products	High	[redacted]	Medium

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
7. Operational Control of Drill and Blast Activities	• Lack of a coordinated drill and blast plan integrating drilling patterns, explosives loading, stemming and initiation sequence • Inadequate communication and timing control around blast design changes, firing times and exclusion zone boundaries • System failure to prevent unauthorised personnel or public from entering blast exclusion zones or buffer areas • Poor control over environmental conditions affecting blasting (wind, temperature inversions, lightning, heavy rain) • Insufficient procedures for misfire identification, management, investigation and clearance authorisation	High	[redacted]	Medium
8. Mobile Plant, Traffic and Interface with Blasting Areas	• Uncontrolled mo[redacted]ks, loaders, excavators [redacted] vehicle[redacted] proximity to blast sites and quarry fa[redacted]s • Inadequate traffic manage[redacted]ound exclusion zones, blast tie[redacted]ites and explosives transport paths • Poor visibility, dust, lighting and road design increasing collision and run-off-road risks near highwalls and blast areas • Unclear segregation between heavy mobile plant, explosives delivery vehicles and pedestrian access during blast preparation and excavation of shot rock	High	[redacted]	Medium

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. Emergency Preparedness, Response and First Aid	• Lack of a quarry-specific emergency management plan covering blast-related scenarios, slope failure and serious vehicle incidents • Unclear roles, responsibilities and communication protocols during emergencies, including interface with emergency services • Insufficient first aid capability, rescue equipment and training for foreseeable quarry and blasting incidents • Poorly planned evacuation routes and muster points, including those affected by blasting operations and changing quarry geometry • Failure to consider off-site impacts a community notifications during significant incidents or uncontrolled blasts	High	[redacted]	Medium
10. Health, Hygiene, Noise, Vibration and Psychosocial Risks	• Excessive noise d vibration from blasting and mobil lant im workers and nearby nity hea and amenity • Chronic exposure to respirable crystalline silica and dust g rated by drilling, blasting and crushing activities • Stress and fatigue among key personnel (e.g. supervisors, shotfirers, operators) due to production pressures and high-consequence decision making • Insufficient management of worker health monitoring and fitness for work, including substance impairment risks • Inadequate communication and management of community concerns and complaints about blasting impacts	High	[redacted]	Medium

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]	
11. Environmental and Public Safety Interface	• Insufficient control of public access to quarry boundaries, haul roads and areas potentially affected by flyrock or vibration • Inadequate buffer zones and land use planning around quarry and blasting areas • Uncontrolled environmental releases such as dust, noise, vibration and blast fumes affecting public areas, roads and neighbouring properties • Lack of integration between WHS and environmental management systems leading to conflicting priorities or gaps control	High	[redacted]	Medium
12. Monitoring, Audit, Review and Continuous Improvement	• Failure to systema[redacted]monitor th effectiveness of quarry and blasting [redacted]k controls • Incomplete data on incid[redacted], near misses, vibration exceedances, misfires and community complaints hindering accurate risk assessment • Lack of periodic management review of WHS performance, leading to stagnation or drift from required standards • Inadequate audit processes for critical elements such as explosives management, exclusion zones, traffic management and emergency readiness	High	[redacted]	Medium

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

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