



**Australian Government**

**Department of Education, Employment and Workplace Relations**

# **RIIBLA401A Manage blasting operations**

**Release: 1**

## **RIIBLA401A Manage blasting operations**

### **Modification History**

Not applicable.

### **Unit Descriptor**

This unit covers the management of blasting operations in resources and infrastructure industries. It includes the requirements for managing: compliance with legislation; the storage, handling and transport of explosives; the implementation of blasting activities; special conditions; misfires; disposal of explosives; and the maintenance of blasting equipment.

### **Application of the Unit**

This unit is appropriate for those working in a supervisory role or as a technical specialist, within:

- Civil construction
- Coal mining
- Drilling
- Extractive industries
- Metalliferous mining

### **Licensing/Regulatory Information**

Refer to Unit Descriptor.

### **Pre-Requisites**

Not applicable.

### **Employability Skills Information**

This unit contains employability skills.

## Elements and Performance Criteria Pre-Content

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| <p>Elements describe the essential outcomes of a unit of competency.</p> | <p>Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.</p> |
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## Elements and Performance Criteria

| ELEMENT   | PERFORMANCE CRITERIA   |
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| 1. Manage compliance with legislation                       | 1.1. Access, interpret and apply <b>compliance documentation</b> relevant to the management of blasting operations<br>1.2. Access, interpret and validate the blast design criteria<br>1.3. Identify and obtain relevant permits, licenses or authorities needed for blasting activities<br>1.4. Apply the legislative and site requirements and procedures for the purchase of <b>explosives</b><br>1.5. Apply the procedures for the identification of <b>potential hazards</b> and the implementation and application of the site/organisation risk management system<br>1.6. Apply the procedures to monitor the setting up and security of explosives storage location in compliance with legislative and site requirements<br>1.7. Manage legislative and site blasting reporting requirements and procedures<br>1.8. Report any loss or theft of explosives |
| 2. Manage the storage, handling and transport of explosives | 2.1. Apply the legislative and site requirements and procedures for safe handling of explosives<br>2.2. Apply the legislative and site requirements, procedures and safety precautions for the transport of explosives<br>2.3. Apply the legislative and site requirements, procedures and safety precautions for the storage of explosives<br>2.4. Apply the legislative and site requirements and procedures for setting-up and maintaining secure <b>explosives storage locations</b>   |
| 3. Manage the implementation of blasting activities         | 3.1. Identify <b>environmental hazards</b> and analyse the risks associated with blasting<br>3.2. Implement the <b>blast plan</b><br>3.3. Apply the blast monitoring system in accordance with site procedures<br>3.4. Apply site and legislative procedures to  |

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|                              | <p>ensure that <i>site inspections</i> to confirm the blast plan are implemented</p> <p>3.5. Confirm and manage the availability of the type and quantity of <i>explosives and associated materials</i> required for blasting</p> <p>3.6. Manage the site procedures and legislative requirements for the coordination of support requirements including vehicles, <i>personnel</i> and other <i>equipment</i></p> <p>3.7. Apply site procedures for setting up and securing the blast area</p> <p>3.8. Apply the special requirements for secondary blasting operations</p> <p>3.9. Apply and manage <i>post-blasting coordination</i> and <i>inspection</i> requirements</p> <p>3.10. Complete all statutory and site-required <i>documents</i></p> |
| 4. Manage special conditions | <p>4.1. Identify potential hazards resulting from physical, biological or chemical situations which include heat, cold, climatic and electro-static condition</p> <p>4.2. Control and monitor special conditions that may occur</p> <p>4.3. Ensure that records and reports on special conditions are kept and maintained according to legislative and site requirements and procedures</p>   |
| 5. Manage misfires           | <p>5.1. Apply site procedures for the re-assessment of the blast site for potential hazards and risks and ensuring work area is safe</p> <p>5.2. Inspect blast area to identify <i>misfires</i> or potential misfires and identify cause of misfire</p> <p>5.3. Secure the misfire area and communicate information to other <i>personnel</i> who may be affected</p> <p>5.4. Apply procedures to for washing-out or re-charging, and manage refiring according to relevant legislation, standards and site procedures</p> <p>5.5. Communicate the area is now safe with other persons who may have been affected by blasting</p> <p>5.6. Record and report misfires according to</p>   |

|   | relevant legislation and site procedures  |
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| 6. Manage the disposal of explosives        | <p>6.1. Identify damaged or <b>deteriorated explosives</b> and accessories</p> <p>6.2. Select an applicable <b>disposal method</b> for explosives and accessories</p> <p>6.3. Plan for the disposal of the damaged, deteriorated or surplus explosives</p> <p>6.4. Carry out the disposal of damaged, deteriorated and surplus explosives and detonators in accordance with legislative requirements and site procedures</p> <p>6.5. Communicate disposal activities to site emergency services</p>   |
| 7. Manage maintenance of blasting equipment | <p>7.1. Identify the equipment necessary for use in preparing, initiating or <b>monitoring</b> blasting operations</p> <p>7.2. Monitor maintenance and conduct routine inspection of blast and blast monitoring equipment in accordance with manufacturer's requirements and site procedures</p> <p>7.3. Monitor the maintenance of blast monitoring instrumentation to ensure valid calibration as specified in manufacturers' requirements and according to site procedures</p> <p>7.4. Ensure that maintenance and inspection records are kept according to site, manufacturer's or legislative requirements</p> |

## Required Skills and Knowledge

This section describes the skills and knowledge required for this unit.

### Required skills

Specific skills are required to achieve the performance criteria in this unit, particularly for the application in the various circumstances in which this unit may be applied. This includes the ability to carry out the following as required to manage blasting operations:

- apply legislative, organisation and site requirements and procedures
- apply legislative and site requirements and procedure for blasting activities
- select and use PPE
- read plans and documents
- apply electronic, radio and other means of communication
- apply blasting preparation techniques
- identify hazards/apply hazardous substances handling techniques
- perform blasting mathematical calculations
- apply diagnostic techniques
- apply inspection and monitoring procedures for:
  - storage, handling and transport of explosives
  - charging
  - blast initiation
  - post blast activities
  - environmental impact monitoring
  - equipment maintenance management
  - explosives disposal
  - records maintenance

### Required knowledge

Specific knowledge is required to achieve the Performance Criteria of this unit, particularly its application in a variety of circumstances in which the unit may be used. This includes knowledge of the following, as required to manage blasting operations:

- Australian standards and codes
- blast site procedures
- explosives and safety and health legislation
- emergency procedures
- environmental procedures
- equipment processes, technical capability and limitations
- equipment safety requirements
- basic geological and technical information
- blast plans

- hazardous goods procedures (handling and transport)
- isolation and lock out procedures
- manufacturers' instructions
- management systems
- preparation for and use of explosives
- safe operating procedures
- risk management including application of appropriate controls to identify risks
- site procedures
- transportation of explosives
- job safety analysis
- start up and shut down procedures
- explosives storage procedures
- types and characteristics of blasting agents, explosives and initiation systems
- concepts such as density, velocity and relationships between variable
- assimilation, interpretation and application of information and technical data
- mathematical processes and applications
- cause and management of misfires
- identification of safety and environmental hazards
- explosives disposal methods
- record keeping requirements and formats



## Evidence Guide

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| <p>The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.</p> |   |
| <p><b>Overview of assessment</b></p>  |   |
| <p><b>Critical aspects for assessment and evidence required to demonstrate competency in this unit</b></p>  | <p>The evidence required to demonstrate competency in this unit must be relevant to worksite operations and satisfy all of the requirements of the performance criteria, required skills and knowledge and the range statement of this unit and include evidence of the following:</p> <ul style="list-style-type: none"> <li>• knowledge of the requirements, procedures and instructions for the management of blasting operations</li> <li>• implementation of appropriate procedures and techniques for the safe, effective and efficient management of blasting operations</li> <li>• working with others to plan, prepare and conduct blasting operations</li> <li>• provision of clear and timely instruction and supervision by the individual of those involved in blasting operations</li> <li>• evidence of the consistent successful management of blasting operations</li> </ul> |
| <p><b>Context of and specific resources for assessment</b></p>  | <ul style="list-style-type: none"> <li>• This unit must be assessed in the context of the work environment. Where personal safety or environmental damage are limiting factors, assessment may occur in a simulated environment provided it is realistic and sufficiently rigorous to cover all aspects of workplace performance, including task skills, task management skills, contingency management skills and job role environment skills.</li> <li>• The assessment environment should not disadvantage the participant. For example, language, literacy and numeracy demands of assessment should not be greater than those required on the job.</li> <li>• Customisation of assessment and delivery environment to sensitively accommodate cultural diversity.</li> <li>• Aboriginal people and other people from a non</li> </ul>  |

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|  | <p>English speaking background may have second language issues.</p> <ul style="list-style-type: none"> <li>• Assessment of this competency requires typical resources normally used in a resources and infrastructure sector environment. Selection and use of resources for particular worksites may differ due to the site circumstances.</li> <li>• Where applicable, physical resources should include equipment modified for people with disabilities.</li> <li>• Access must be provided to appropriate learning and/or assessment support when required.</li> </ul>   |
| <b>Method of assessment</b>                | <p>This unit may be assessed in a holistic way with other units of competency. The assessment strategy for this unit must verify required knowledge and skill and practical application using more than one of the following assessment methods:</p> <ul style="list-style-type: none"> <li>• written and/or oral assessment of the candidate's required knowledge</li> <li>• observed, documented and/or first hand testimonial evidence of the candidate's: <ul style="list-style-type: none"> <li>• implementation of appropriate procedures and techniques for the safe, effective and efficient achievement of the required outcomes</li> <li>• consistently achieving the required outcomes</li> </ul> </li> <li>• first hand testimonial evidence of the candidate's: <ul style="list-style-type: none"> <li>• working with others to plan, prepare and conduct blasting operations</li> <li>• provision of clear and timely instruction and supervision by the individual of those involved in the conduct of the blasting operations</li> </ul> </li> </ul> |
| <b>Guidance information for assessment</b> | <p>Consult the SkillsDMC User Guide for further information on assessment including access and equity issues.</p>  |

## Range Statement

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| <p>The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.</p> |   |
| <p><b>Relevant compliance documentation</b> may include:</p>   | <ul style="list-style-type: none"> <li>• legislative, organisation and site requirements and procedures</li> <li>• manufacturer's guidelines and specifications</li> <li>• Australian standards</li> <li>• code of practice</li> <li>• Employment and workplace relations legislation</li> <li>• Equal Employment Opportunity and Disability Discrimination legislation</li> </ul>  |
| <p><b>Explosives</b> may include:</p>  | <ul style="list-style-type: none"> <li>• high explosives (e.g. packaged and bulk high explosives)</li> <li>• low explosives (e.g. black powder)</li> <li>• deflagrating explosives (e.g. propellants used for secondary blasting)</li> <li>• detonators and detonator assemblies</li> <li>• detonating cords and accessories</li> <li>• fuses and igniter cords</li> </ul>  |
| <p><b>Potential hazards</b> may include:</p>   | <ul style="list-style-type: none"> <li>• broken detonator leads</li> <li>• dust and fumes</li> <li>• faulty equipment</li> <li>• faulty explosives</li> <li>• ground conditions</li> <li>• high air and water pressures</li> <li>• high voltage electricity</li> <li>• hydraulic oil pressure</li> <li>• lost holes</li> <li>• misfires</li> <li>• trespassers</li> <li>• radio frequencies and transmitters</li> <li>• EMF hazards (e.g. static electricity, lightning)</li> <li>• hot ground</li> </ul> |
| <p><b>Storage locations</b> may include:</p>   | <ul style="list-style-type: none"> <li>• permanent licensed-to-store magazines</li> <li>• relocatable magazines</li> <li>• underground magazines</li> </ul>   |

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|   | <ul style="list-style-type: none"> <li>• underground temporary storage</li> <li>• day boxes</li> <li>• on site temporary areas</li> <li>• designated transport vehicle</li> </ul>  |
| <b>Environmental hazards</b> may include:               | <ul style="list-style-type: none"> <li>• the transmission of compression-tension elastic vibrations in both solids and gases</li> <li>• the generation and projection of elements, compounds and particulates from the site of explosion and related quantifiable damage</li> <li>• physical damage to the environment</li> <li>• damage to infrastructure</li> <li>• damage to fauna and flora</li> <li>• impact on human and domestic animal life and amenity</li> <li>• perceived and psychological-emotional disturbance</li> <li>• fluctuations and alterations of the hydrosphere</li> </ul> |
| <b>Blast plan</b> requirements may include:             | <ul style="list-style-type: none"> <li>• location</li> <li>• sleeping charges</li> <li>• equipment required</li> <li>• security measures and procedures</li> <li>• monitoring requirements</li> <li>• type and quantity of explosives and initiation methods</li> <li>• wet or dry holes</li> <li>• stemming material</li> </ul>   |
| <b>Site inspections</b> may include:                    | <ul style="list-style-type: none"> <li>• positioning stemming</li> <li>• cleaning up</li> <li>• weather check</li> <li>• fencing/signage and access routes</li> <li>• marking/hole identification</li> <li>• inspection</li> <li>• measuring holes</li> <li>• dewatering holes</li> </ul>  |
| <b>Explosives and associated materials</b> may include: | <ul style="list-style-type: none"> <li>• blasting agents</li> <li>• detonators</li> <li>• detonating cords</li> <li>• water gels or emulsions</li> <li>• bulk or packaged</li> <li>• shaped charges</li> <li>• permitted explosives</li> <li>• high explosives</li> </ul>  |

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|                               | <ul style="list-style-type: none"> <li>• propellants</li> <li>• pressure loaders (kettle)</li> <li>• detonation mechanisms including:</li> <li>• bell wire</li> <li>• delay mechanisms</li> <li>• initiators</li> <li>• meter readings</li> <li>• safety fuses and tapes</li> <li>• tape</li> <li>• exploders</li> <li>• circuit testers</li> <li>• connecting wire and cables</li> <li>• crimpers</li> <li>• approved chord cutters</li> <li>• stemming rods</li> <li>• loading poles</li> <li>• gas bags</li> <li>• decking</li> <li>• stemming</li> <li>• hole liner</li> <li>• blast monitoring equipment</li> <li>• firing cables/bell wire</li> <li>• remote firing equipment (e.g. PED)</li> </ul> |
| <b>Personnel</b> may include: | <ul style="list-style-type: none"> <li>• shotfirers</li> <li>• magazine keepers</li> <li>• contractors</li> <li>• drillers</li> <li>• drivers</li> <li>• miners</li> <li>• visitors</li> <li>• trainees/apprentices</li> <li>• inspectors</li> <li>• licensed operators</li> <li>• maintenance staff</li> <li>• management</li> <li>• service personnel</li> <li>• supervisors</li> <li>• surveyors</li> <li>• tradespersons</li> </ul>   |
| <b>Equipment</b> may include: | <ul style="list-style-type: none"> <li>• vehicles approved for carrying dangerous goods and explosives</li> <li>• explosives mixers</li> </ul>  |

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|   | <ul style="list-style-type: none"> <li>• pumps</li> <li>• plugs (to seal finished holes prior to loading)</li> <li>• measuring tape</li> <li>• cutting implements</li> <li>• blast monitoring systems</li> <li>• video cameras</li> </ul>   |
| <b>Post-blast coordination</b> may include:         | <ul style="list-style-type: none"> <li>• withdrawal of sentries</li> <li>• return of unused explosives and equipment</li> <li>• removal of signs</li> <li>• turning off safety devices</li> <li>• ventilation of area</li> </ul>  |
| <b>Site inspections</b> may include:                | <ul style="list-style-type: none"> <li>• positioning stemming</li> <li>• cleaning up</li> <li>• weather check</li> <li>• fencing/signage and access routes</li> <li>• marking/hole identification</li> <li>• inspection</li> <li>• measuring holes</li> <li>• dewatering holes</li> </ul>   |
| <b>Documents, records, and reports</b> may include: | <ul style="list-style-type: none"> <li>• records of purchase</li> <li>• records of carriage</li> <li>• records of consumption and disposal of explosives</li> <li>• cart notes</li> <li>• magazine records</li> <li>• blast designs</li> <li>• blast plans</li> <li>• shotfirer's reports</li> <li>• blast monitoring records</li> <li>• complaints, injury and accident reports</li> <li>• records of face profiling and bore tracking surveys, videotapes or photographs</li> <li>• records may be kept as papers, bound forms, field books, computer printouts, floppy disks, videotapes, digital recordings, specific or routine reports or logbooks</li> </ul> |
| <b>Misfires</b> may be caused by:                   | <ul style="list-style-type: none"> <li>• faulty explosives or accessories</li> <li>• damaged or deteriorated explosives or accessories</li> <li>• improperly assembled explosives components</li> <li>• inappropriate or incomplete combinations of components</li> </ul>   |

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|  | <ul style="list-style-type: none"> <li>• operator error or inexperience</li> <li>• inattention to detail or ignorance</li> <li>• environmental influences (e.g. wet weather or poor visibility)</li> </ul>  |
| <b>Deteriorated explosives</b> may show symptoms of: | <ul style="list-style-type: none"> <li>• exudation</li> <li>• efflorescence</li> <li>• sweating</li> <li>• liquefaction</li> <li>• hardening</li> <li>• softening</li> <li>• discoloration</li> <li>• crystallisation</li> <li>• staining</li> <li>• damage to wrappers and carcasses</li> <li>• damage to containers</li> <li>• physical wear and tear</li> <li>• kinking</li> <li>• abrasions and cuts</li> <li>• crushing</li> <li>• loss of identification labels and markings</li> <li>• exposure to the elements</li> </ul> |
| <b>Disposal methods</b> may include:                 | <ul style="list-style-type: none"> <li>• burning by the shottirers on site</li> <li>• detonation in a production drill hole</li> <li>• detonation in a controlled manner</li> <li>• return to supplier or delivery or surrender to an explosives inspector</li> </ul>   |

## Unit Sector(s)

Blasting

## Competency field

Refer to Unit Sector(s).

## Co-requisite units

Not applicable.