



Australian Government

RIIMCU606E Establish and maintain the mining method and strata management systems

Release: 1

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Modification History

Release	Comments
Release 1	This version first released with RII Resources and Infrastructure Industry Training Package Version 5.0.

Application

This unit describes the skills and knowledge required to establish and maintain mining methods and strata management systems in underground coal mining, including design, development, audit and review processes and procedures.

It applies to those working in management roles. They generally perform complex, non-routine tasks involving strategic and planning activities and are responsible for establishing and maintaining operational systems and plans.

Licensing, legislative and certification requirements that apply to this unit can vary between states, territories and industry sectors. Users must check requirements with relevant body before applying the unit.

Unit Sector

Coal mining (underground)

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
<i>Elements describe the essential outcomes.</i>	<i>Performance criteria describe the performance needed to demonstrate achievement of the element.</i>
1. Plan and prepare to establish and maintain mining method and strata management system	1.1 Access, interpret and apply mining method and strata management documentation 1.2 Identify and record resources required to create and maintain a stable mining structure 1.3 Identify and evaluate historical mine site information relating to strata management 1.4 Identify, assess and record possible mining structure failure modes relevant to mine site 1.5 Determine criteria for establishing the stability of mining structures

ELEMENT	PERFORMANCE CRITERIA
	according to site requirements 1.6 Identify hazards and analyse risks associated with failures of mining structures 1.7 Identify and assess the limitations and controls applying to design of stable mining structures
2. Identify and evaluate geological and geotechnical information to establish stable mining structures	2.1 Identify and determine exploration techniques for gathering information relating to geological, hydrological and geotechnical conditions 2.2 Identify and evaluate geological, geotechnical and hydrological information, with respect to stable mining methods 2.3 Identify and evaluate strata gas information, with respect to stable mining methods 2.4 Identify and evaluate roof, seam and floor lithological and physical properties information, with respect to stable mining methods 2.5 Identify and evaluate stress regimes information, with respect to stable mining methods
3. Identify and evaluate mining engineering principles and practices	3.1 Identify and evaluate mining system types and methods according to site requirements 3.2 Identify potential layouts for stable mining structures according to engineering analysis and site requirements 3.3 Identify and evaluate mining constraints relating to development of stable mining structure 3.4 Identify and evaluate equipment required for development and maintenance of stable mining structure 3.5 Identify effects of mining induced subsidence on surface areas
4. Identify, evaluate and determine strata control systems	4.1 Identify, evaluate and determine ground support systems according to site requirements 4.2 Identify, evaluate and determine ground support installation and monitoring systems according to site requirements 4.3 Identify and evaluate strata failure mechanisms according to site requirements 4.4 Identify and evaluate natural and induced stress control methods according to site requirements
5. Establish strata management system	5.1 Design and establish methods of entry to the coal seam according to site requirements 5.2 Design and establish systems of mining according to site requirements 5.3 Design and establish sequences for mining operations according to site requirements 5.4 Design and establish strata management procedures according to site requirements

ELEMENT	PERFORMANCE CRITERIA
	5.5 Identify training needs and confirm training plan is established according to site requirements 5.6 Establish action response plans for management of strata movement according to site requirements
6. Plan and prepare to implement mining method and strata management systems	6.1 Access, interpret and clarify the mining method and strata management system 6.2 Identify and communicate roles and responsibilities to all personnel according to strata management plan 6.3 Identify, forecast, obtain and allocate/schedule resources required to implement strata management plan 6.4 Develop the monitoring and review processes for strata management system according to site requirements
7. Establish process to audit strata management system	7.1 Audit mining structures for stability according to site requirements 7.2 Audit monitoring systems according to site requirements 7.3 Audit compliance to action response plans according to site requirements 7.4 Audit recording and reporting systems according to site requirements 7.5 Audit maintenance program and procedures according to site requirements 7.6 Audit training plan according to site requirements 7.7 Establish procedures for response to instances of non-compliance or other discrepancies/deficiencies revealed by audit

Foundation Skills

This section describes those language, literacy, numeracy and employment skills that are essential to performance but not explicit in the performance criteria.

SKILL	DESCRIPTION
Oral communication	Conveys information and requirements clearly and listens actively
Reading	Identifies and interprets relevant information from workplace procedures, documentation and legislation
Writing	Prepares specific information that complies with a range of requirements, using sector-specific vocabulary, grammatical structures and conventions

Unit Mapping Information

Supersedes and is equivalent to RIIMCU606D Establish and maintain the mining method and strata management systems.

Links

Companion Volume Implementation Guide is found on VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=88a61002-9a21-4386-aaf8-69c76e675272>

Assessment Requirements for RIIMCU606E Establish and maintain the mining method and strata management systems

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Performance Evidence

The candidate must demonstrate the ability to complete the tasks outlined in the elements, performance criteria and foundation skills of this unit, including evidence of the ability to:

- establish and maintain mining methods and strata management systems on at least two occasions, including:
 - identifying viable options and selecting mining methods and strata management techniques that best meet required outcomes
 - conducting enquiries and investigations and preparing reports
 - analysing and reporting on training needs.

During the above, the candidate must:

- locate and apply relevant legislation, documentation, policies and procedures and confirm work activity is compliant
- implement procedures and techniques for establishing and maintaining mining methods and strata management systems, including:
 - operating strata monitoring equipment
 - collecting, collating and interpreting mining structures data
 - accessing and evaluating data from monitoring systems and equipment
 - performing mathematical calculations
 - interpreting and applying mathematical and scientific theorems/laws related to mining structures
 - accessing, interpreting and applying mine survey information
 - interpreting and applying design criteria for mining structures systems and devices
 - accessing and analysing historical strata information related to the mine and failure mode of mine structures
- work effectively with others to establish and maintain mining methods and strata management systems, including:
 - communicating clearly and concisely with others to receive and clarify work instructions, and convey work progress

- identifying the relevant information and scope of the work necessary to meet required outcomes
- designing and establishing sequences for mining operations
- preparing technical procedures relating to mining structures.

Knowledge Evidence

The candidate must be able to demonstrate knowledge to complete the tasks outlined in the elements, performance criteria and foundation skills of this unit, including knowledge of:

- key legislation required to establish and maintain mining methods and strata management systems
- key procedures and documentation required to establish and maintain mining methods and strata management systems, including those relating to:
 - mine plans
 - ventilation
 - gas monitoring
 - strata support
 - safety management plans
 - risk management processes
 - mine planning and design
 - audit methodologies
 - environmental issues, hazards and risks
 - geological, geotechnical and hydrological information
- principles and techniques for identifying and evaluating the systems of mining, including:
 - tunnels
 - drifts
 - stone drivage
 - shift sinking
 - pillar extraction
 - partial extraction
 - punch mining
 - longwall mining, including installation and recovery
 - the use of breaker line supports
 - faults drivage
- principles and techniques for identifying and assessing factors affecting stability of mining structures, including:
 - stress analysis, including:
 - mining induced stress
 - vertical stress
 - horizontal stress tectonics
 - sedimentology, including:

- subsidence
- water bearing strata
- permeability of seam and strata
- hydrology
- physical property testing
- caving characteristics
- windblast
- outburst
- gas content
- over and underlying strata
- mining structure failure modes
- ground support systems
- pillar design criteria
- pillar stress, strain, strength and ratios
- width and height ratios
- roof support design criteria
- Mohr's Circle
- Young's Modules
- Poisson's Ratio
- stress distribution diagrams
- safety factors
- principles and techniques for identifying and evaluating systems of work, including:
 - bord and pillar
 - place changing
 - longwall
 - highwall
 - auger mining
 - pillar extraction
 - partial extraction
 - use of breaker line supports
 - punch mining
- techniques for identifying and evaluating mining and general engineering principles relating to the behaviour of excavations in rock, including:
 - exploration techniques
 - geology, lithology and strata gas characteristics
 - mine surveying
 - mining of coal deposits
- techniques for identifying individual training needs and reviewing mining methods and strata management system training plans

- principles, processes and techniques for emergency response, evacuation and disaster planning
- techniques for leading and coordinating work activities with others.

Assessment Conditions

Mandatory conditions for assessment of this unit are stipulated below. The assessment must:

- include access to:
 - strata management plan
- be conducted in a safe environment; and,
- be assessed in the context of this sector's work environment; and,
- be assessed in compliance with relevant legislation/regulation and using policies, procedures and processes directly related to the industry sector for which it is being assessed; and,
- confirm consistent performance can be applied in a range of relevant workplace circumstances.

Where personal safety or environmental damage are limiting factors, assessment may occur in a simulated work environment* provided it is realistic and sufficiently rigorous to cover all aspects of this sector's workplace performance, including environment, task skills, task management skills, contingency management skills and job role environment skills.

Assessor requirements

Assessors must be able to clearly demonstrate current and relevant industry knowledge and experience to satisfy the mandatory regulatory standards as set out in the Standards for Registered Training Organisations (RTOs) 2015/Australian Quality Training Framework mandatory requirements for assessors current at the time of assessment and any relevant licensing and certification requirements. This includes:

- vocational competencies at least to the level being delivered and assessed
- current industry skills directly relevant to the training and assessment being provided
- current knowledge and skills in vocational training and learning that informs their training and assessment
- formal relevant qualifications in training and assessment
- having knowledge of and/or experience using the latest techniques and processes
- possessing the required level of RII training product knowledge
- having an understanding and knowledge of legislation and regulations relevant to the industry and to employment and workplaces
- demonstrating the performance evidence, and knowledge evidence outlined in this unit of competency, and
- the minimum years of current** work experience after competency has been obtained as specified below in an industry sector relevant to the outcomes of the unit.

It is also acceptable for the appropriately qualified assessor to work with an industry expert to conduct assessment together and for the industry expert to be involved in the assessment judgement. The industry expert must have current industry skills directly relevant to the training and assessment being provided. This means the industry subject matter expert must demonstrate skills and knowledge from the minimum years of current work experience after competency has been obtained as specified below, including time spent in roles related to the unit being assessed:

Industry sector	AQF indicator level***	Required assessor or industry subject matter expert experience
Drilling, Metalliferous Mining, Coal Mining, Extractive (Quarrying) and Civil Infrastructure	1	1 year
	2	2 years
Drilling, Coal Mining, Extractive (Quarrying), Metalliferous Mining and Civil Infrastructure	3-6	3 years
Other sectors	Where this unit is being assessed outside of the resources and infrastructure sectors assessor and/or industry subject matter expert experience should be in-line with industry standards for the sector in which it is being assessed and where no industry standard is specified should comply with any relevant regulation.	

*Guidance on simulated environments has been stipulated in the Companion Volume Implementation Guide located on VETNet.

**Assessors can demonstrate current work experience through employment within industry in a role relevant to the outcomes of the unit; or, for external assessors this can be demonstrated through exposure to industry by conducting a minimum number of site assessments as determined by the relevant industry sector, across various locations.

*** While a unit of competency does not have an AQF level, where a unit is being delivered outside of a qualification the first numeric character in the unit code should be considered as the AQF indicator level for assessment purposes.

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