



Australian Government

RIINHB311E Conduct mud rotary drilling operations

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 conduct mud rotary drilling. It includes making up drill fluid, installation and monitoring of equipment and maintenance procedures.

It applies to those working in operational roles. They generally perform tasks involving a broad range of skilled applications in a wide variety of contexts, which may involve some discretion and judgement in selecting equipment, services and contingency measures.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Drilling

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 for mud rotary drilling	1.1 Obtain, interpret and confirm work requirements 1.2 Access, interpret and apply mud rotary drilling documentation and confirm work activity is compliant 1.3 Identify and minimise environmental issues and potential hazards, and assess and address risks within scope of own role and according to workplace procedures 1.4 Select and wear personal protective equipment required for work activities 1.5 Communicate with other personnel at site according to work requirements and confirm briefings and handover details are communicated and received

ELEMENT	PERFORMANCE CRITERIA
2. Operate mud rotary drill in line with established requirements	2.1 Carry out prestart and start-up procedures according to manufacturer specifications and workplace procedures 2.2 Make up drill fluid according to work requirements 2.3 Set up drill string, bits, rods and casings required to complete work activity 2.4 Check, adjust and maintain fluid recirculation systems according to work requirements 2.5 Install collar and seal according to work requirements 2.6 Operate equipment and adjust parameters to suit conditions of the hole 2.7 Install casing, grout and screens to correct zones according to work requirements 2.8 Identify problems or faults and rectify or report within scope of own responsibility and according to workplace procedures
3. Complete equipment shut down and maintenance activities	3.1 Shut down and secure equipment in line with workplace procedures 3.2 Follow maintenance schedule according to work requirements 3.3 Complete and file or distribute documentation for drilling operations and equipment according to workplace procedures

Foundation Skills

This section describes those language, literacy and numeracy and employment skills that are essential to performance.

SKILL	DESCRIPTION
Reading	Identifies and interprets information from workplace procedures, policies and documentation
Numeracy	Identifies and comprehends relevant mathematical information in relation to operating mud rotary drills and fluid systems
Writing	Produces and completes workplace reports using appropriate vocabulary, grammatical structures and conventions
Oral communication	Uses listening and questioning to clarify and confirm understanding

Unit Mapping Information

Supersedes and is equivalent to RIINHB311D Conduct mud rotary drilling.

Links

Companion Volume implementation guides is found on VETNet -

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

Assessment Requirements for RIINHB311E Conduct mud rotary drilling operations

Modification History

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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:

- conduct mud rotary drilling on at least two occasions, including:
 - planning and preparing for mud rotary drilling, by:
 - developing a work plan for a hole, outlining:
 - environmental practice
 - health and safety considerations
 - target depth
 - construction materials to be used
 - equipment to be used
 - mud design
 - grouting if required
 - conducting pre-start and shutdown checks
 - making up and checking drill string and down hole assembly for wear, gauge and damaged threads to ensure components are in suitable condition
 - operating mud rotary drill, including:
 - designing and adjusting mud system to suit geological conditions and changes to conditions during drilling, including:
 - lost circulation
 - water supply
 - flow rates
 - fluid cleaning
 - hole stability
 - conducting sampling to confirm drilling fluids are suitable for application by testing:
 - density
 - viscosity

- pH levels
- velocity
- pressure control
- weight control
- filtration levels
- monitoring and adjusting up hole velocity as required
- installing collar casing and seal
- adjusting feed and rotation as required
- installing production casings, screens and grout if required
- disposing of drill fluids no longer required
- conducting routine checks and performing maintenance.

During the above, the candidate must:

- locate and apply relevant documentation, policies and procedures
- identify and control any hazardous conditions and contaminants
- apply solutions to identified problems, including if applicable:
 - significant drilling operational issues including unexpected geology
 - loss circulation zones
 - swelling/shales
 - weight/pressure control
- read, interpret and apply safety data sheets (SDS) for handling hazardous materials
- communicate with clients, co-workers and management to receive and clarify work instructions and coordinate work activities prior to commencing
- comply with written and verbal reporting requirements and procedures associated with mud rotary drilling operations.

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 policies, procedures and established requirements for conducting mud rotary drilling, including those for:
 - workplace health and safety
 - emergencies
 - environmental practice
 - set up and installation of drilling equipment and materials
 - processes for mud mixing and conditioning
 - maintenance and repair
- basic geological data
- lag time and up hole velocity
- key factors affecting work activities described in performance evidence above, including:

- types of mud and water delivery pumps and their applications
- types of formations and effects on drilling fluids
- types of fluids, including properties and functions of fluids
- types of bits, rods and casings and their functions.

Assessment Conditions

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

- include access to:
 - equipment required to conduct mud rotary drilling
 - personal protective equipment
- be conducted in a safe environment
- be assessed in context of the sector's work environment
- be assessed in compliance with relevant legislation and regulations and using policies, procedures, processes and operational manuals directly related to the industry sector for which it is being assessed
- 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/AQTF 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 Construction	1	1 year
	2	2 years
Drilling, Coal Mining, Extractive (Quarrying), Metalliferous Mining and Civil Construction	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 RII 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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