



Australian Government

NWPHYD007 Measure discharge using wading method

Release: 1

NWPHYD007 Measure discharge using wading method

Modification History

Release 1. This is the first release of this unit of competency in the NWP National Water Training Package.

Application

This unit involves the skills and knowledge required to measure discharge using wading method.

It includes collecting stream discharge data using a range of current meters, collecting depth and velocity data, assessing risk and factors affecting the accuracy and precision of the area velocity gauging method.

This unit applies to hydrographers and technicians involved in the monitoring of all elements of the water cycle and impacts on the environment. Those undertaking this unit would work autonomously, usually with supervisory responsibilities, while performing complex tasks in a range of contexts.

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

Pre-requisite Unit

Not applicable.

Competency Field

Hydrometric Monitoring

Unit Sector

Not applicable.

Elements and Performance Criteria

ELEMENTS

Elements describe the essential outcomes.

1 Prepare for discharge measurement

PERFORMANCE CRITERIA

Performance criteria describe the performance needed to demonstrate achievement of the element.

1.1 Identify hazards, assess risks and implement control measures according to workplace procedures

- 1.2 Identify the monitoring objective of the work measurement or monitoring site and gauge requirements
 - 1.3 Identify, analyse and confirm data collection methods appropriate to site conditions
 - 1.4 Select appropriate equipment and instruments to meet site conditions
 - 1.5 Verify calibration and maintenance status of equipment according to manufacturer instructions and workplace procedures
 - 1.6 Evaluate and prepare site to take discharge measurements according to workplace procedures
 - 1.7 Identify influences on discharge measurement
 - 1.8 Select cross-section for discharge measurement according to workplace procedures
- 2 **Collect depth and velocity data**
 - 2.1 Measure the width of the section according to workplace procedures
 - 2.2 Select appropriate sounding points and verticals to subdivide the cross-section
 - 2.3 Measure the depth of vertical using method suited to site conditions
 - 2.4 Select appropriate velocity measurement method to suit flow and cross section conditions
 - 2.5 Collect velocity data at appropriate depths for each vertical
- 3 **Calculate discharge**
 - 3.1 Calculate the point velocity according to workplace procedures
 - 3.2 Calculate the mean velocity for each vertical
 - 3.3 Calculate the area of subsection corresponding to each vertical
 - 3.4 Calculate the discharge corresponding to each subsection
 - 3.5 Calculate the area and discharge at the section by summation of the subsection data

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| | 3.6 | Apply corrections for oblique flow when required |
| 4 | Record and document discharge measurement | |
| | 4.1 | Gather supporting information from the site and complete measurement documentation |
| | 4.2 | Calculate and record the mean stage height and rate of change using relevant mathematical techniques |
| | 4.3 | Grade and record the gauging quality according to workplace procedures |
| | 4.4 | Check measurement computations and record results in database according to workplace procedures |
| | 4.5 | Compare discharge measurement to site rating curve and note deviation |
| | 4.6 | Enter gauging results into database according to workplace procedures |
| | 4.7 | Report site issues or significant deviations from ratings to relevant personnel and stakeholders |

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to NWPHYD011 Measure and process low and medium flows using area velocity methods.

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=26336bc0-04e5-49d9-8c31-46c49b6a0037>

Assessment Requirements for NWPHYD007 Measure discharge using wading method

Modification History

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Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements and performance criteria on at least one occasion and includes:

- analysing and verifying data using workplace procedures, software and databases
- assessing risks and taking appropriate precautions and/or actions
- collecting, entering and archiving data
- collecting field measurements
- communicating with employees and customers
- gathering, interpreting and applying documentation related to the specifics of hydrological data collection and reporting procedures
- identifying potential or actual operational problems
- identifying, reporting and solving potential or actual problems within scope of job function
- interpreting and applying technical documentation
- maintaining testing equipment in good order and verifying calibration
- performing calculations including mean velocity in a vertical
- preparing documentation
- using positioning or distance measurement equipment
- using safety equipment and personal protective equipment

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements and performance criteria and includes knowledge of:

- area velocity methods including:
 - acoustic Doppler current profiler
 - Doppler velocity meter
 - electromagnetic current meter
 - mechanical current meter
- appropriateness of measurement methods
- measurement equipment and quality assurance methods
- measurement section issues and solutions
- relevant legislation, industry standards, workplace policies and procedures including:

- Bureau of Meteorology
- International and Australian Standards
- WHS
- World Meteorological Organisation
- relevant technology
- relevant workplace procedures
- suitable measurement sections, attributes and issues
- turbulent and laminar flow
- workplace documentation for data and reports

Assessment Conditions

Assessors must hold credentials specified within the Standards for Registered Training Organisations current at the time of assessment.

Assessment must satisfy the Principles of Assessment and Rules of Evidence and all regulatory requirements included within the Standards for Registered Training Organisations current at the time of assessment.

Assessment must occur in workplace operational situations where it is appropriate to do so; where this is not appropriate, assessment must occur in simulated workplace operational situations that replicate workplace conditions.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Resources for assessment must include access to:

- relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry
- applicable documentation including legislation, regulations, codes of practice, workplace procedures and operation manuals.

Links

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