



Australian Government

Department of Education, Employment and Workplace Relations

NWP364B Perform laboratory testing

Revision Number: 2

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Modification History

NWP364B Release 2: Layout adjusted. No changes to content.
NWP364B Release 1: Primary release.

Unit Descriptor

This unit of competency describes the outcomes required to perform laboratory tests and/or procedures using standard methods and with access to readily available advice.

Application of the Unit

This unit supports the attainment of skills and knowledge required for laboratory or field assistants with responsibility for testing samples from water and/or wastewater treatment processes.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable.

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency. Performance criteria describe the required performance needed to demonstrate achievement of the element. Where ***bold italicised*** text is used, further information is detailed in the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1 Label, register and store samples for testing.	<p>1.1 Label laboratory samples, ensuring that the required information is transcribed accurately and legibly.</p> <p>1.2 Register samples in a <i>laboratory record system</i> according to organisational requirements.</p> <p>1.3 Record sample testing requirements.</p> <p>1.4 <i>Preserve</i> the integrity of samples as required and eliminate the possibility of cross-contamination.</p>
2 Prepare samples.	<p>2.1 Identify samples to be tested and appropriate test method, equipment and safety requirements according to <i>organisational and statutory requirements</i>.</p> <p>2.2 Compare sample description with the specification, record results and report discrepancies.</p> <p>2.3 <i>Prepare samples</i> according to appropriate standard operating procedures.</p>
3 Check equipment before use.	<p>3.1 Set up test equipment and/or reagents in accordance with the specified test method.</p> <p>3.2 Conduct <i>pre-use and safety checks</i> in accordance with organisational procedures and manufacturer's instructions.</p> <p>3.3 Identify and report faulty or unsafe equipment to appropriate personnel.</p> <p>3.4 Check the calibration status of equipment and conduct calibration or report calibration requirements to appropriate personnel.</p>
4 Perform tests on samples.	<p>4.1 Perform the sequence of tests according to standard operating procedures.</p> <p>4.2 Identify, prepare and weigh or measure sample and standards to be tested.</p> <p>4.3 Conduct <i>test methods</i> according to organisation procedures.</p> <p>4.4 Record results according to organisation procedures.</p> <p>4.5 Perform <i>calculations</i> as required.</p> <p>4.6 Identify and report 'Out of specification' or atypical results promptly to appropriate personnel.</p> <p>4.7 Shut down equipment in accordance with standard operating procedures.</p>
5 Maintain a safe work environment.	<p>5.1 Use established safe work practices and <i>safety equipment</i> to ensure personal safety and that of other laboratory personnel.</p> <p>5.2 Store unused reagents as required by relevant regulations and codes.</p> <p>5.3 Dispose of wastes according to organisational and statutory requirements.</p>

ELEMENT**PERFORMANCE CRITERIA**

5.4 Clean, maintain and store test equipment correctly.

Required Skills and Knowledge

This describes the essential skills and knowledge and their level, required for this unit.

Required skills:

- produce laboratory reports and logs
- use laboratory safety equipment and personal protective equipment
- interpret laboratory test methods
- interpret policies, procedures and standards
- interpret and record test results, including calculation of results from test data where required
- communicate with employees and/or customers
- use communication equipment
- give and receive instructions
- use instrumental and volumetric laboratory equipment
- sub-sample and test products

Required knowledge:

- purpose of tests
- principles of the standard method
- calibration and/or pre-use equipment checks and their basis
- relevant standards and specifications and their interpretation
- source of uncertainty in measurements and methods for control
- importance and appropriate use of certified reference materials
- procedures for recognition of unexpected or unusual results and likely causes
- occupational health and safety procedures for sample and testing
- material safety data sheets
- jar testing
- spectrophotometric analysis
- potentiometric analysis such as redox, ion selective electrodes
- colorimetric comparators
- titrations
- volumetric glassware and dilutions
- gravimetric analysis

Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the Performance Criteria, Required Skills and Knowledge, the Range Statement and the Assessment Guidelines for the Training Package.

Critical aspects for assessment and evidence required to demonstrate competency in this unit

The candidate should demonstrate the ability to perform laboratory tests and procedures including:

- labelling samples for testing
- registering samples and storing correctly
- preparing samples for testing according to the specified test method
- selecting the correct equipment and checking equipment performance
- conducting tests according to specifications
- maintaining a safe work environment

Context of and specific resources for assessment

Access to the workplace and resources including:

- documentation that should normally be available in a water industry organisation
- relevant codes, standards, and government regulations

Where applicable, physical resources should include equipment modified for people with disabilities.

Access must be provided to appropriate learning and/or assessment support when required.

Assessment processes and techniques must be culturally appropriate, and appropriate to the language and literacy capacity of the candidate and the work being performed.

Validity and sufficiency of evidence requires that:

- competency will need to be demonstrated over a period of time reflecting the scope of the role and the practical requirements of the workplace
- where the assessment is part of a structured learning experience the evidence collected must relate to a number of performances assessed at different points in time and separated by further learning and practice
- a decision of competence only taken at the point when the assessor has complete confidence in the person's competence over time and in various contexts
- all assessment that is part of a structured learning experience must include a combination of direct, indirect and supplementary evidence
- where assessment is for the purpose of recognition (RCC/RPL), the evidence provided will need to be

authenticated and show that it represents competency demonstrated over a period of time

- assessment can be through simulated project-based activity and must include evidence relating to each of the elements in this unit

In all cases where practical assessment is used it will be combined with targeted questioning to assess the underpinning knowledge. Questioning will be undertaken in a manner appropriate to the skill levels of the operator, any cultural issues that may affect responses to the questions, and reflecting the requirements of the competency and the work being performed.

Range Statement

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. Add any 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.

Laboratory record systems may include:

- laboratory record sheets
- computer database
- laboratory information management systems

Preservation techniques may include:

- refrigeration
- freezing
- chemical addition
- storage in the dark

Organisational and statutory requirements may include:

- Australian and International Standards such as AS 2830 Good Laboratory Practice
- codes of practice
- standard operating procedures
- equipment manuals
- equipment start up, operation and shutdown procedures
- calibration and maintenance schedules
- quality manuals
- enterprise recording and reporting procedures
- production and laboratory schedules
- material safety data sheets
- material, production and product specifications
- sections of the occupational health and safety legislation
- organisational safety rules and procedures
- relevant state and federal legislation

Samples preparation may include:

- sub-sampling
- dilution
- digestion
- filtration

Pre-use and safety checks may include:

- checklist of required equipment and reagents
- instrument check out procedures
- electrical safety test and tag currency
- calibration status
- battery condition
- use-by date for reagents

Test methods include:

- gravimetric analysis, such as:
 - suspended solids
 - total solids

- spectrophotometric analysis, such as:
 - iron
 - aluminium
 - manganese
- volumetric analysis and dilutions, such as:
 - alkalinity
 - hardness
- test methods may also include:
 - potentiometric analysis, such as:
 - ion selective electrodes
 - redox potential
 - colorimetric analysis, such as:
 - pH
 - chlorine residual
 - microscope techniques
 - jar testing

Calculations may include:

- total suspended solids
- total solids
- alkalinity
- hardness
- dilution ratios
- concentration of standard solutions

Safety equipment may include:

- fume hood
- safety shield
- safety shower and eye wash fountain
- personal protective equipment such as:
 - safety glasses
 - face shields
 - gloves
 - dust masks

Unit Sector(s)

Not applicable.

Competency field

Common.