



Australian Government

Department of Education, Employment and Workplace Relations

NWP261A Operate and maintain water treatment plant and equipment

Revision Number: 2

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Modification History

NWP261A Release 2: Layout adjusted. No changes to content.

NWP261A Release 1: Primary release.

Unit Descriptor

This unit of competency describes the outcomes required to operate water treatment processes within potable community and industrial water treatment plants in urban and rural areas. The ability to operate water treatment processes in compliance with relevant water legislation and regulations, and Australian Drinking Water Guidelines is vital to performance.

Application of the Unit

This unit supports the attainment of skills and knowledge required for operational staff in water treatment plants with responsibility for the practical and safe operation of plant, equipment and 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 Operate water treatment processes.	<p>1.1 Identify <i>reasons and requirements</i> for treatment of water.</p> <p>1.2 Identify major components of <i>water treatment processes</i>.</p> <p>1.3 Identify and apply practices undertaken in water treatment processes.</p> <p>1.4 Operate <i>mechanical equipment</i> used in water treatment according to manufacturer specifications and organisational requirements.</p> <p>1.5 Handle, use, store and dose <i>chemicals</i> according to organisational procedures.</p>
2 Maintain items of equipment used in water treatment processes.	<p>2.1 Identify maintenance requirements and schedules according to standard operating procedures.</p> <p>2.2 Complete maintenance and cleaning requirements of equipment.</p>
3 Follow safety requirements for work in a water treatment plant.	<p>3.1 Identify and record hazards of working in a water treatment plant.</p> <p>3.2 Identify and record operational requirements for the safe and effective use of equipment.</p> <p>3.3 Select, fit and use safety equipment, including personal protective equipment.</p> <p>3.4 Identify and apply safe work practices when handling chemicals and working in a water treatment plant.</p>
4 Complete documentation.	<p>4.1 Complete records required for effective operation of a water treatment plant according to organisational requirements.</p> <p>4.2 Identify and record range of data routinely collected.</p> <p>4.3 Identify data that falls outside normal operating parameters and report for further action.</p>

Required Skills and Knowledge

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

Required skills:

- apply policies, procedures and standards
- recognise and report operational problems
- use safety equipment and personal protective equipment
- collect and test samples
- interpret material safety data sheets (MSDS)
- receive and apply instructions
- use literacy skills in regard to verbal and written communication in the workplace
- communicate with other employees and people that interact within work environment

Required knowledge:

- water cycle
- sources of water
- uses of water, both domestic and industrial
- physical, chemical and microbiological characteristics of water within the water treatment process
- water quality characteristics
- reasons for water treatment
- types of treatment plants and processes
- major chemicals and equipment used
- water treatment plant hazards
- safety equipment
- reasons for data and information collection

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 operate water treatment processes within potable community and industrial water treatment plants in urban and rural areas including:

- applying water treatment processes, including operating mechanical equipment
- using chemicals safely and according to organisational procedures
- conducting regular routine inspection of mechanical equipment
- identifying hazards and applying appropriate safety procedures
- gathering and recording data
- reporting anomalies

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 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

Questioning will be undertaken in a manner appropriate to the skill levels of the operator and cultural issues that may affect responses to the questions, and will reflect 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.

Reasons and requirements for treatment include:

- ensuring conformity with standards and guidelines, including Australian Drinking Water Guidelines
- removal of impurities, contaminants and pollution
- impact of impurities on water treatment processes
- relevant water legislation and regulations relating to water and the environment
- hazard analysis critical control point (HACCP) operational philosophy

Water treatment processes may include:

- screens
- coagulation and flocculation
- sedimentation clarification
- dissolved air flotation
- granular and membrane filtration
- disinfection
- aeration and oxidation
- fluoridation
- reverse osmosis
- ion exchange
- activated carbon adsorption
- calibration of dosing equipment
- softening
- backwash water treatment

Mechanical equipment may include:

- pumps, including:
 - centrifugal
 - positive displacement
 - airlift
- blowers and compressors
- mixers and chemical batching facilities
- control valves
- electronic digital monitoring systems
- recording systems
- chemical testing and analysis equipment
- communication equipment
- flow meters
- alarms and process control systems

Chemicals and aids used may include:

- centrifuge
- belt filter press
- screens, including raked bar screens
- manual or hydraulic equipment
- lime
- soda ash
- aluminium and iron coagulants
- polymers
- chlorine
- fluoride
- carbon dioxide

Unit Sector(s)

Not applicable.

Competency field

Treatment.