



Australian Government

Department of Education, Employment and Workplace Relations

NWP101B Investigate sustainable water cycle management

Revision Number: 2

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Modification History

NWP101B Release 2: Layout adjusted. No changes to content.

NWP101B Release 1: Primary release.

Unit Descriptor

This unit of competency describes the outcomes required to understand the water cycle, sustainable water usage and the testing of water quality. The ability to understand the link between the services and systems of the water organisation and supply to, and usage by, the consumer is essential to performance.

Application of the Unit

This unit supports the attainment of skills and knowledge required for new entrants to the industry or those who are preparing to enter the water industry workforce or undertaking assignment and field work related to water research. Successful completion of this unit would be facilitated by partnership with a water industry organisation. There are opportunities to integrate delivery and assessment of this unit with mainstream high school programs (mathematics, science, geography, physics, engineering and English).

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable.

Employability Skills Information

This unit of competency 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 Identify water cycle and water systems	<p>1.1 Find out about and explain continuous cycle of evaporation and condensation that controls distribution of earth's water.</p> <p>1.2 Find out about and explain methods of capturing, storing and distributing water.</p> <p>1.3 Find out about and explain range of <i>water and waste systems</i> used to deliver services.</p> <p>1.4 Find out about and explain community's use of water services.</p> <p>1.5 Use <i>appropriate water industry terms</i> when communicating and reporting.</p>
2 Identify sustainable water practices	<p>2.1 Identify and report ways for households to minimise water usage and increase available supply.</p> <p>2.2 Find out about and report ways for communities to minimise water usage and increase available supply.</p> <p>2.3 Find out about and report <i>ways to increase sources</i> of water supply.</p>
3 Assess factors affecting water quality	<p>3.1 Identify bodies responsible for establishing and managing standards for water quality.</p> <p>3.2 Identify and explain characteristics, requirements and standards for drinking water.</p> <p>3.3 Identify and explain <i>environmental risks and impacts</i> to water services.</p> <p>3.4 Find out about and report methods and procedures used by water organisations to maintain water quality.</p>

Required Skills and Knowledge

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

Required skills:

- research and interpret legal, social, community and environmental requirements and impact on water resource management
- identify system and infrastructure components of selected water systems
- identify agencies involved in water management
- identify environmental policies, plans and procedures
- use literacy skills for verbal and written communication in collaborating, research and reporting.

Required knowledge:

- legal, social, community and environmental requirements which apply to a selected water environment
- terminology applicable to water systems, water usage, water conservation and the water industry
- control procedures for environmental risks and incidents
- principally environmental impact assessment
- primary agencies involved in drinking water quality and environmental management
- water quality performance indicators
- overview of the water supply system
- water hazardous agents and preventative strategies
- community and agency roles and responsibilities in monitoring water quality
- recording methods.

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 research and interpret the water cycle, sustainable water usage and the testing of water quality including:

- identifying and exploring the meaning of the water cycle and implications for community's use of water services
- identifying and exploring systems and customer services offered by water industry organisations
- identifying the factors which influence customer expectations and satisfaction
- identifying and exploring factors that can contribute to sustainable water practices within communities and households
- identifying and exploring strategies that can be employed to increase access to water resources
- exploring and communicating factors affecting water quality

Context of and specific resources for assessment

Access to resources including:

- library, water enterprise information, information sources for research and investigation
- mentors, advisors and teachers able to guide and support research and investigation of water resource management
- guided visits to key locations associated with water resource management

Access must be provided to appropriate learning and assessment support.

Assessment processes and techniques must take into account language, literacy and cultural factors which might have an impact on the candidate's demonstration of competency.

Validity and sufficiency of evidence requires that:

- competency will need to be demonstrated over a variety of assignments and activities reflecting the scope and practical requirements of research and practical assignments
- assessment can be through assignments, projects, excursions and 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 underpinning knowledge

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.

Range of water and waste systems include:

- water catchment systems
- water storage systems
- water treatment systems
- water distribution systems
- stormwater drainage systems
- sewerage systems and sewerage treatment systems
- trade waste treatment systems

Appropriate water industry terms include:

- sewage versus sewerage
- rising main or pressure main
- reservoirs and tanks
- standpipes
- pumping stations
- water and wastewater
- stormwater
- infiltration and inflow
- pressure and head
- flow
- concentration

Ways for households to minimise water usage and increase available supply include:

- installation of water saving fittings
- behavioural change
- roof water re-use
- grey water recycling

Ways for communities to minimise water usage and increase available supply include:

- use of tiered water access or rationing systems
- promotion and use of incentives to drive behavioural change in consumers
- planning changes to allow water recycling and re-use
- introduction of third pipe systems in new housing estates.

Ways to increase sources include:

- introduction of desalination plants
- introduction of new treatment plants and re-use strategies
- development of new catchment infrastructure

Environmental risks and impacts may include:

- impact of mismanagement of potential pollutants
- impact of mismanagement of biological agents and contaminants
- impact of variable and changing water resources
- community waste disposal

- impact on urban and non-urban water catchment areas
- impact on rivers, waterways and channels
- water and wastewater treatment processes
- trade waste treatment and disposal processes
- construction and infrastructure
- risk factors for catchment water quality
- backflow and cross-connections
- stormwater
- function of wastewater and stormwater systems

Unit Sector(s)

Not applicable.