



Australian Government

Department of Education, Employment and Workplace Relations

NWP262A Monitor and report wastewater treatment processes

Revision Number: 2

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Modification History

NWP262A Release 2: Layout adjusted. No changes to content.

NWP262A Release 1: Primary release.

Unit Descriptor

This unit of competency describes the outcomes required to monitor and report on wastewater treatment processes within domestic and industrial wastewater treatment plants in urban and rural areas. The ability to monitor processes to ensure that wastewater disposal or re-use meets state or territory licensing requirements is essential to performance.

Application of the Unit

This unit supports the attainment of skills and knowledge required for operational staff in wastewater treatment plants with responsibility for monitoring 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 Identify sources and characteristics of wastewater and reasons for wastewater treatment.	1.1 Identify <i>wastewater sources</i> and characteristics. 1.2 Identify <i>reasons</i> and <i>statutory requirements</i> for wastewater treatment.
2 Monitor and report on wastewater quality.	2.1 Identify <i>wastewater treatment processes</i> and determine their application. 2.2 Check <i>characteristics of wastewater</i> according to organisational procedures. 2.3 Record and report wastewater quality according to organisational procedures.
3 Follow safety requirements for work in a wastewater treatment plant.	3.1 Identify and record hazards of working in a wastewater treatment plant. 3.2 Identify operational requirements for safe and effective use of <i>equipment</i> . 3.3 Select, fit and use safety equipment, including personal protective equipment. 3.4 Identify and apply safe work practices when handling <i>chemicals</i> and working in a wastewater treatment plant.
4 Monitor and report on wastewater treatment.	4.1 Identify operating principles used in wastewater treatment processes. 4.2 Complete records required for effective operation of a wastewater treatment plant. 4.3 Identify, record and report range of <i>data</i> routinely collected. 4.4 Carry out, record and report <i>process calculations</i> . 4.5 Identify data that falls outside normal operating <i>parameters</i> and report for further action.

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
- select, 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 the work environment

Required knowledge:

- sources of wastewater
- physical, chemical and microbiological characteristics and operating principles related to wastewater treatment
- reasons for wastewater treatment
- types of wastewater treatment plant processes
- major chemicals and equipment used
- wastewater 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 monitor and report on wastewater treatment processes within domestic and industrial wastewater treatment plants in urban and rural areas including:

- performing, recording and reporting process measurements and calculations
- demonstrating procedures for starting and stopping plant and locking out control equipment
- adjusting process controls according to specific plant procedures
- recording and reporting faults and breakdowns
- identifying common process faults and following procedures to rectify these

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

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 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.

Wastewater sources may include:

- domestic
- industrial
- storm
- ground

Reasons for treatment may include:

- ensuring conformity with legislation, regulations, standards and codes
- removal of impurities and contaminants to enable discharge or re-use
- reducing impact of impurities on the environment and public health

Statutory requirements are defined by:

- relevant federal and state or territory legislation and regulations
- codes of practice, associated standards and guidance material
- documented organisational policies, manuals and induction programs
- relevant community planning and development agreements, such as land care agreements

Wastewater treatment processes may include:

- grit removal
- aeration
- screening
- sedimentation
- disinfection
- granular and membrane filtration
- thickening and dewatering
- suspended and fixed media aerobic bioreactor processes
- anaerobic processes
- lagoons and wetlands
- gas scrubbers
- biosolids and effluent disposal and re-use
- dilution
- chemical dosing
- nutrient removal
- reverse osmosis

Characteristics of

- types of impurities, such as:
 - organic

wastewater may include:

- inorganic
- micro-organisms
- public health considerations

Equipment used may include:

- pumps, including:
 - centrifugal
 - positive displacement
 - airlift
- blowers
- screens
- control valves
- electronic digital monitoring systems
- recording systems
- chemical testing and analysis equipment
- communication equipment
- belt press
- centrifuge
- comminutor
- flow meters
- flow recorders
- manual or hydraulic equipment
- personal protective equipment

Chemicals and major equipment used may include:

- chemicals and lime
- sodium hypochlorite
- aluminium and iron coagulants
- polymers

Data may include:

- instantaneous flow rate
- flow records
- temperature
- sand and grit
- pH
- chemical oxygen demand
- dissolved oxygen
- settleable solids concentration (cone test)
- thirty minute settleability test
- sludge blanket level
- residual chlorine
- microscopic examination
- conductivity

Process calculations may include:

- average dry weather flow
- peak dry weather flow
- chemical feed rate and concentration

Wastewater quality
parameters may include:

- process efficiency
- physical
- chemical
- microbiological

Unit Sector(s)

Not applicable.

Competency field

Treatment.