



Australian Government

Department of Education, Employment and Workplace Relations

NWP345B Monitor, operate and control water treatment processes

Revision Number: 2

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Modification History

NWP345B Release 2: Layout adjusted. No changes to content.

NWP345B Release 1: Primary release.

Unit Descriptor

This unit of competency describes the outcomes required to perform basic monitoring, operation, control and measurement of water treatment plant processes and to report on water treatment plant system performance and process quality control.

Application of the Unit

This unit supports the attainment of skills and knowledge required for operational staff that may be required to perform monitoring, operation and control of water treatment plant, as an additional and occasional part of their normal job role.

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 <i>bold italicised</i> text is used, further information is detailed in the range statement. Assessment of performance is to be consistent with the evidence guide.
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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1 Monitor treatment plant performance.	1.1 Carry out <i>routine plant inspections</i> according to the type of plant and <i>organisational procedures and statutory requirements</i>. 1.2 Select and check <i>equipment</i> and correctly fit and use personal protective equipment. 1.3 Collect water and other process samples and conduct standard <i>tests</i>. 1.4 Collect, record and report process data according to organisational and plant requirements.
2 Prepare chemical dosing.	2.1 Use, handle and store <i>chemicals</i> according to organisational procedures and statutory requirements. 2.2 Determine and prepare chemical dosing according to plant procedures and statutory requirements. 2.3 Maintain information related to chemical supply and usage according to organisational procedures and statutory requirements.
3 Operate and control processes.	3.1 Conduct chemical dosing according to organisational procedures and statutory requirements. 3.2 Identify and report <i>process</i> faults and the operational condition of plant according to organisational procedures and statutory requirements. 3.3 Initiate basic <i>system adjustments</i> to improve system performance according to organisational procedures and statutory requirements.
4 Compile process records.	4.1 Compile reports from plant and system data to meet organisational procedures and statutory requirements. 4.2 Report observations outside defined parameters for further action.

Required Skills and Knowledge

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

Required skills:

- solve operational problems
- perform process calculations
- produce reports and logs
- use safety equipment and personal protective equipment
- interpret plans, charts and instructions
- interpret policies, procedures and standards
- communicate with employees and customers
- work effectively as part of a team
- use communication equipment
- give and receive instructions
- prepare and apply chemical dosing
- operate computerised equipment
- identify control system faults
- sample and test products

Required knowledge:

- system hydraulics
- system layout
- lock out procedures for mechanical and electrical installations
- policies, procedures and legislation
- relevant utilities and service bodies
- communication systems
- hazardous materials handling
- environmental, landscape and ground structure of work area
- risk factors and potential hazards associated with the operation of water treatment processes
- chemical dosing processes
- process calculations
- equipment operation, capacity and limitations
- effects of weather and conditions on operation of site or plant
- pumping and valving systems
- mechanical and electrical control systems
- policies and procedures for storing and handling dangerous goods and chemicals
- interpretation and use of material safety data sheets
- chemical and biological principles that form the basis of water treatment

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 basic monitoring, operation, control and measurement of water treatment plant processes including:

- conducting routine plant inspections, taking samples and performing basic tests
- preparing and applying chemical dosing according to instructions
- identifying and reporting system faults
- making basic system adjustments according to instructions
- completing required documentation

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 should only be made 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.

Routine plant inspections may include:

- visual observation of:
 - raw water
 - floc formation
 - sedimentation
 - filtration
 - filtered water
 - dosing equipment
- interaction and communication with other employees, other authorities and the general public
- implementation of reporting procedures that may also include procedures for the implementation of by-laws, organisational policies and statutory requirements

Organisational procedures and statutory requirements may include:

- by-laws and organisational policies
- standard operating procedures
- environment protection
- occupational health and safety
- chemicals
- dangerous goods
- electrical
- lifts and cranes
- World Health Organisation standards
- Australian Drinking Water Guidelines
- licensing agreements

Equipment may include:

- electronic monitoring and metering systems
- chart recording systems
- basic hand tools
- sampling and laboratory testing equipment
- computerised equipment
- communication equipment
- personal protective equipment

Tests may include:

- testing of raw, clarified, filtered and finished water for:
 - turbidity
 - colour
 - pH
- finished water should be tested for chlorine residual

- other tests may include:
 - hardness
 - alkalinity
 - routine jar testing
- Chemicals** may include:
- chlorine gas
 - sodium hypochlorite
 - calcium hypochlorite
 - carbon dioxide
 - alum
 - powder activated carbon
 - polymers
 - lime
- Processes** may include:
- pre-treatment, for example:
 - screen systems
 - lime
 - chlorination
 - chemical addition, for example:
 - coagulation
 - flocculation
 - flash-mixing
 - solids separation, for example:
 - sedimentation
 - flotation
 - filtration
 - membrane processes
 - disinfection, for example:
 - chlorination
 - ozonation
 - chloramination
 - post-treatment, for example:
 - fluoridation
- System adjustments** may include:
- dosing adjustments
 - pH correction

Unit Sector(s)

Not applicable.

Competency field

Treatment.