Australian Government

Department of Education, Employment and Workplace Relations

NWP351B Monitor, operate and control activated sludge processes

Revision Number: 2

NWP351B Monitor, operate and control activated sludge processes

Modification History

Not applicable.

Unit Descriptor

Unit descriptor This unit of competency describes the outcomes required to monitor, operate and control activated sludge processes including derivatives such as IDEA and SBR processes, Bathurst box processes and oxidation ditches. This unit also describes the outcomes required to measure and report on activated sludge process performance and quality control.

Application of the Unit

Application of the unit This unit supports the attainment of skills and knowledge required for operational staff with a specific responsibility for ensuring that activated sludge processes including derivatives such as IDEA and SBR processes, Bathurst box processes and oxidation ditches, comply with organisational and statutory requirements.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable.

Employability Skills Information

Employability Skills 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 required skills and knowledge and/or the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1 Monitor activated sludge process performance.	1.1 Monitor test results and ***processes*** to meet ***organisational and statutory requirements***.
	1.2 Identify and report faults and the operational condition of the process according to organisational procedures and statutory requirements.
2 Operate and control activated sludge processes.	2.1 Select and check ***equipment*** and correctly fit and use personal protective equipment.
	2.2 Carry out ***routine plant inspections*** according to the type of plant and organisational requirements.
	2.3 Collect process samples and conduct standard ***tests***.
	2.4 Carry out ***system adjustments*** and ***process calculations*** to enhance system performance according to organisational procedures and statutory requirements.
	2.5 Collect and report process data according to organisational and plant requirements.
3 Compile process records.	3.1 Compile ***reports*** from plant and system data to meet organisational procedures and statutory requirements.
	3.2 Report observations outside defined parameters for further action.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills:

- identify and correct operational and control system problems
- take samples and perform tests
- produce logs and reports
- interpret plans, charts and instructions
- interpret policies, procedures and standards
- give and receive instructions
- determine chemical dosing requirements
- operate control and communication systems
- use safety and personal protective equipment
- perform process related calculations
- use safety and personal protective equipment
- communicate with employees and various customers
- work effectively as part of a team
- operate computerised equipment
- take samples and conduct tests.

Required knowledge:

- process layout
- features and components of activated sludge systems
- theory of process operation and monitoring
- operational problems such as sludge bulking and foaming
- control of solids such as F:M ratio, sludge age
- chemicals used for pH control, odour control, nutrient addition
- flow measurement
- risk factors and potential hazards related to activated sludge systems
- risk control requirements including safety equipment and material safety data sheets
- lockout procedures for mechanical and electrical installations and hydraulic isolation
- equipment operation, capacity and limitations
- operation of pumping and valving systems
- control and communications systems
- policies, procedures and relevant legislation
- relevant utilities and service bodies
- process calculation
- hazardous materials handling
- interpretation and use of material safety data sheets
- chemical and biological principles that form the basis of activated sludge wastewater

REQUIRED SKILLS AND KNOWLEDGE

treatment.

Evidence Guide

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, operate and control activated sludge processes, including:

- monitoring test results and processes
- identifying and reporting faults
- conducting routine plant inspections
- taking samples and performing basic tests
- making basic process adjustments according to instructions
- collecting data and 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

EVIDENCE GUIDE

(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

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 if the candidate, accessibility of the item, and local industry and regional contexts.

Processes may include:	• suspended media aerobic processes such as: • conventional and/or extended aeration activated sludge • contact stabilisation • high rate activated sludge processes.
Organisational and statutory requirements may include:	• by-laws and organisational policies • standard operating procedures • Australian and New Zealand Environment and Conservation Council (ANZECC) guidelines • environment protection • occupational health and safety • chemicals • dangerous goods • lifts and cranes • Environment Protection Authority regulations • licensing agreements • electrical standards.
Equipment used may include:	• diffused aeration • surface aerators • aspirating aerators • electronic monitoring and metering systems • chart recording systems • basic hand tools • sampling and laboratory testing equipment • computerised equipment • on- and off-road vehicles • communication equipment • personal protective equipment • pumps and valves.
Routine plant inspection may include:	• interaction and communication with other employees, other authorities and the general public • visual observation • identification of corrosion damage • implementation of reporting procedures that may also include procedures for the implementation of by-laws,

RANGE STATEMENT

	organisational policies and statutory requirements.
Tests may include:	• settling tests • microscopic observation • pH • dissolved oxygen • suspended solids • oxygen demand • oxygen uptake rates • respiration rates • nutrient analysis, such as: • nitrogen • phosphorus • temperature.
System adjustments may include:	• pH correction • dissolved oxygen levels • flow rates • nutrient addition • return and wasting rates.
Process calculations may include:	• sludge volume index • solids inventory • food to micro-organisms ratio • mean cell residence time • oxygen uptake rate and respiration rate • return activated sludge flow rate • sludge wasting rates • secondary sedimentation, such as: • detention time • weir overflow rate • surface and solids loading rate.
Reports may include:	• plant performance data • chemical usage.

Unit Sector(s)

Not applicable.

Competency field

Competency field Treatment