



Australian Government

NWPTRT084 Assess and improve activated sludge and nutrient removal processes

Release: 1

NWPTRT084 Assess and improve activated sludge and nutrient removal processes

Modification History

Release	Comments
1	This unit was released in NWP Water Training Package release 1.0 and meets the Standards for Training Packages. This unit supersedes and is equivalent to NWP412A Investigate and plan the optimisation of activated sludge processes. • Unit code updated • Content and formatting updated to comply with the new standards • All PC transitioned from passive to active voice • Unit title changed to better reflect unit outcomes • Elements 1 and 2 merged and all PC renumbered • Element 3 removed • One new Element added • PC 4.1 and 4.2 removed • PC 4.3 revised

Application

This unit describes the skills required to assess, evaluate system performance and investigate and report on the optimisation of activated sludge and nutrient removal treatment processes in maintaining water quality.

This unit applies to those working as technical staff with a specific responsibility for optimising activated sludge and nutrient removal treatment processes.

The skills and knowledge described in this unit must be applied within the legislative, regulatory and policy environment in which they are carried out. Organisational policies and procedures must be consulted and adhered to.

Those undertaking this unit would work under indirect supervision, performing complex tasks in a familiar context.

No licensing, legislative or certification requirements apply to unit at the time of publication.

Competency Field

Treatment

Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the range of conditions section.
1. Assess process	1.1 Review existing process performance data. 1.2 Review existing operational processes with reference to manufacturer and plant designer specifications. 1.3 Identify the impact of influent quality on treatment process. 1.4 Identify additional sampling and testing required for valid evaluation of current process performance. 1.5 Review existing fault reports and other relevant plant asset information. 1.6 Investigate the operational status of plant components.
2. Improve process	2.1 Investigate the cause of effluent quality issues. 2.2 Investigate the operational status of the wastewater treatment process. 2.3 Assess the effectiveness of process control strategies. 2.4 Identify treatment process conditions for optimising the growth of beneficial microorganisms.
3. Report on process	3.1 Compile report on current status. 3.2 Make recommendations on optimisation options.

Foundation Skills

The foundation skills demands of this unit have been mapped for alignment with the Australian Core Skills Framework (ACSF). The following tables outline the performance levels indicated for successful attainment of the unit.

ACSF levels indicative of performance:

1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Learning NA					Reading					Writing					Oral communication					Numeracy				

Performance variables:

1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Support					Context					Text complexity					Task complexity				

Further information on ACSF and the foundation skills underpinning this unit can be found in the Foundation Skills Guide on the GSA website.

Range of Conditions

Activated sludge processes include:	- sequencing batch reactors (SBR) - intermittent decant extended aeration (IDEA) - Bathurst Box - oxidation ditches
Nutrient removal processes include:	- biological nutrients removal - fermentation - pre-fermenters

Unit Mapping Information

This unit supersedes and is equivalent to NWP412A Investigate and plan the optimisation of activated sludge processes.

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=26336bc0-04e5-49d9-8c31-46c49b6a0037>

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Assessment Requirements for NWPTRT084 Assess and improve activated sludge and nutrient removal processes

Modification History

Release	Comments
1	These Assessment Requirements were released in NWP Water Training Package release 1.0 and meet the Standards for Training Packages. • Assessment Requirements created drawing upon specified assessment information from superseded unit

Performance Evidence

Evidence required to demonstrate competence must satisfy all of the requirements of the elements and performance criteria. The candidate must be assessed preparing recommendation reports on at least one process listed in the Range of Conditions. If not otherwise specified the candidate must demonstrate evidence of performance of the following on at least one occasion.

- identifying wastewater microorganisms
- selecting measures to optimise the growth of beneficial microorganisms
- identifying a range of wastewater microorganisms, and their general characteristics and types of problems caused
- identifying effluent quality and selecting process control strategies to optimise the growth of beneficial microorganisms
- preparing reports outlining the optimum treatment for various microorganisms including measures to ensure validity
- performing various calculations to provide data for the analysis and development of options and solutions, including at least one of F:M ratio, MCRT
- return and wasting rates
- preparing and applying chemical dosing as required
- reviewing existing activated sludge or BNR treatment process performance with reference to historical data, differences in raw water quality and plant configuration
- identifying data deficiencies
- assessing fault reports and investigating the current operational status of activated sludge or BNR treatment process plant components
- investigating current and potential chemical addition practices
- planning trials to test the performance of the determined activated sludge or BNR treatment process optimisation options
- identifying the general characteristics of different types of microorganisms

- identifying wastewater characteristics that impact on microorganism growth
- identifying the problems caused by microorganisms in specific wastewater treatment processes

Knowledge Evidence

Evidence required to demonstrate competence must satisfy all of the requirements of the elements and performance criteria. If not otherwise specified the depth of knowledge demonstrated must be appropriate to the job context of the candidate.

- types, lifecycle, characteristics of wastewater microorganisms
- operational problems caused by wastewater microorganisms
- effluent quality problems caused by wastewater microorganisms
- properties and mode of action of chemical additives
- principles that form the basis of activated sludge treatment processes
- principles that form the basis of BNR-activated sludge treatment processes, including nitrification and de-nitrification, enhanced biological phosphorous removal
- types of activated sludge and BNR-activated sludge treatment processes
- activated sludge and BNR microbiology

Assessment Conditions

Competency should be assessed in an actual workplace or in a simulated environment, with access to equipment and infrastructure appropriate to the outcome. Competency should be demonstrated over time to ensure the candidate is assessed across a variety of situations.

Assessors must satisfy the NVR/AQTF mandatory competency requirements for assessors.

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