Wastewater Treatment Technician

Unit WWTTO02 Tertiary Treatment

This training specification has been developed from the water process technician standard. The specification details the **minimum** training specification, as agreed by industry employers, to deliver the skills and knowledge required to carry out tertiary treatment operations in the water sector.

The specification details the critical requirement of the activity to carry out the work outlined and does not preclude employers from adding to the skills and knowledge detailed by the specification in their own training programmes.

All work must be carried out to approved procedures and practices and in accordance with statutory health, safety and environmental requirements.

What does this specification look like?

Wastewater treatment technicians need to be able to:

TTO1 Control tertiary treatment operations on wastewater treatment works

TTO2 Optimise tertiary treatment operations on the basis of process performance, test results and analysis of trends

TTO3 Restore tertiary treatment processes to normal operation through identification of the root cause of faults arising with the processes

What do I need to take this module?

Candidates to be **assessed** as competent in this area should have successfully completed the modules shown below or have evidence demonstrating an equivalent level of competence.

1. SHEA water or equivalent
2. WWTTC01 - Wastewater compliance and performance monitoring

Performance Criteria

To achieve this unit, you will need to be able to:

General Requirements

Candidate must demonstrate competence in a minimum of 2 of the following processes:

a) Sand filters – Dynasands, rapid gravity filters
b) BAFFs
c) NSAFs
d) Clarifiers
e) Nitrifying filters
f) Polishing biological filters
g) Micro-strainer / membrane
h) Reed beds
i) Grass plots
j) Lagoons

P1. Identify the work area to be accessed using company documentation, systems and work instructions
P2. Select, inspect and wear required PPE in line with company procedures
P3. Carry out a site specific risk assessment of the work area, identifying the hazards and implementing the control measures required
P4. Maintain accurate and up to date records
P5. Report information and data to the designated person

Task Specific - Tertiary Treatment

P6. Safely carry out operational and first line maintenance tasks relating to the process, fault finding and resolution.
P7. Identify and locate the tertiary treatment processes and associated equipment on the works and on the information system e.g. SCADA / HMI
P8. Identify all mechanical, electrical and instrumentation assets which monitor and control the tertiary treatment processes on the works and on the information system e.g. SCADA / HMI
P9. Confirm the correct configuration, operation and performance of the tertiary treatment processes and that it corresponds to the information system e.g. SCADA / HMI
P10. Identify and maintain control parameters associated with the tertiary treatment processes and associated equipment
P11. Optimise the tertiary treatment processes to efficiently achieve the required parameters
P12. Respond to alarms correctly

P13. Instigate corrective actions to restore the tertiary treatment processes to compliant conditions, taking account of process lag time
P14. Evaluate trend data from the information system e.g. SCADA / HMI, tests and / or process performance to identify:
    a) Normal trends or cycles for the works, and
    b) Atypical trends or changes and the underlying or root causes for the change
P15. Complete process monitoring to specification, appropriate to the works
P16. Identify and locate any chemicals, storage, mixing and pumping equipment and on the works and on the information system e.g. SCADA / HMI that could impact on tertiary treatment processes
P17. Monitor, check, record and report chemical dosing on their works
P18. Deal with spillages / pollutions safely and correctly

Knowledge and Understanding

To achieve this unit, you will need to know and understand:

General Requirements

K1. The principles of Health, Safety and Environmental legislation in relation to working with wastewater
K2. The organisation's safety rules, policies and procedures relating to working with wastewater
K3. The hazards associated with working with wastewater and the correct way to respond to them
K4. How to select, inspect and use PPE when working with wastewater
K5. How to carry out a site specific risk assessment and identify workplace hazards
K6. How to respond in the event of an emergency situation in the workplace environment
K7. How to leave the work area in a safe and secure condition
K8. The company recording and reporting process

Task Specific - Tertiary Treatment

K9. How to safely carry out operational and first line maintenance tasks taking into account any systems of work and operating procedures
K10. The key principles and objectives of tertiary treatment operations on wastewater treatment works and describe the flow route, including any works returns
K11. Specific legislation and directives relating to tertiary treatment processes
K12. Key process parameters and variables associated with tertiary treatment
K13. The main generic different types of tertiary treatment processes including gravity and mechanical systems, pumps and associated ancillary equipment used and the design considerations associated with these:

a) Sand filters – Dynasands, Rapid gravity filters
b) BAFFs
c) NSAFs
d) Clarifiers
e) Nitrifying filters
f) Polishing biological filters
g) Micro-strainer / membrane
h) Reed beds
i) Grass plots
j) Lagoons

K14. The correct design and optimal operation of tertiary treatment processes, the common problems associated with them and the consequences of sub-optimal performance including odour issues

K15. How to interrogate the information system e.g. SCADA / HMI to:
a) Identify and control Items of mechanical, electrical and instrumentation equipment
b) Evaluate trend data differentiating normal operational cycles from fault conditions

K16. How to confirm the configuration, operation and performance of the tertiary treatment processes and how it corresponds to the information system e.g. SCADA / HMI

K17. Any chemicals used on the works that could impact on tertiary treatment processes, the reason and sequence of their use

K18. The range of plant used to store, mix and pump chemicals and the methods of operation available (automatic or manual and calibration)

K19. The range of instrumentation used to monitor and control the process and their calibration requirements

K20. Alarms, action levels, authorisation levels and consequences associated with the process

K21. Factors which can affect tertiary treatment effluent quality including operational, mechanical, chemical and weather related factors

K22. How to identify the root cause of tertiary treatment problems

K23. Understand the sequence of actions required to restore the processes to compliant conditions, taking account of all process variables and process lag times

K24. The consequences of sub-optimal tertiary treatment operations on the effluent / subsequent process streams including the consequences of
a) Maintenance
b) Deliberate adjustments
c) Desludging operations
d) Taking a process unit out of service

K25. How to complete tertiary treatment monitoring to specification and any limitations

K26. The tools used in first line maintenance tasks, their uses and limitations

K27. Data collection, recording, reporting and maintenance requirements

How will it be assessed?

To achieve this unit, you will need to be able to provide evidence of the performance criteria and the knowledge and understanding requirements listed above.

Assessment types:

1. External assessment – an external accrediting body will assess against a national minimum standard
2. Internal assessment process – a company led on-going assessment against requirements
3. End-point assessment – see assessment plan for further details here (will be Energy & Utility Skills defined)

What type of evidence will be expected?

To achieve this unit, you will need to be able to provide evidence of the performance criteria and the knowledge and understanding requirements listed above.

Evidence types:

1. On-going local assessments
    a) Assessment plan, review, feedback, standard assessment sheets
2. Knowledge based learning
    a) Classroom, exams, assignments, Q&A sessions, e-learning modules
3. Evidence portfolios
    a) Learning logs, photos, observation sheets

Assessment types and process