ENERGY & ENVIRONMENT AWARDS

Skills for a greener world

EEA Level 3 End-point Assessment for Water Treatment Technician
(Water Treatment Technician; Water Treatment Equipment Technician; Legionella Risk Assessor; Water Treatment Operations Supervisor)

Specification

QAN 610/6028/8
ST0453 V1.0

Specification for

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Updates to this specification

Since the first publication of Energy & Environment Awards Water Treatment Technician (WTT) Specification – Water Treatment Technician; Water Treatment Equipment Technician; Legionella Risk Assessor; Water Treatment Operations Supervisor, the following updates have been made.

Version	Date first published	Section updated	Page(s)
v2.0	August 2025	Rebranded	All
v1.1	June 2025	Formatting	All
v1.0	March 2024	First published	All

Section 1: At a Glance EPA Summary

Qualification name	EEA Level 3 End-point Assessment for Water Treatment Technician
Ofqual qualification number	610/6028/8
Standard reference	ST0453
Assessment plan	AP01
Standard title	Water Treatment Technician
Pathways	Water Treatment Technician Water Treatment Equipment Technician Legionella Risk Assessor Water Treatment Operations Supervisor
Level	3
Gateway pre-requisites submitted to Energy & Environment Awards	Apprentice has: • achieved a minimum Level 2 English and maths • compiled and submitted a portfolio of evidence, which supports the professional discussion
On-programme duration	Typically 24-30 months
Gateway readiness	Apprentice has met all Gateway pre-requisites. Employer completes, signs and submits Gateway Eligibility Form (GER) form to Energy & Environment Awards. See Appendix B, WTT Supporting Documents 'Gateway Eligibility Form.'

End-point assessment duration	Typically 3 months after the Gateway
End-point assessment methods and their order	• Knowledge test • Observation • Professional discussion (supported by a portfolio of evidence)
End-point assessment methods and component grading	• Knowledge test: Fail; Pass or Distinction • Observation: Fail or Pass • Professional discussion supported by a portfolio: Fail; Pass or Distinction
Overall Grading	Fail; Pass or Distinction
Certification	Energy & Environment Awards request Apprenticeship completion certificates from the ESFA
Glossary of Terms	See Appendix A, WTT Supporting Documents

Objective

The purpose of the Water Treatment Technician (WTT) end-point assessment (EPA) is to confirm that an apprentice is fully capable of doing their job before they receive their apprenticeship certificate. It also helps to demonstrate that what an apprentice has learned can be applied in the real world.

Once the apprentice has completed the WTT end-point assessment requirements successfully and has been certified they could take on the following job roles:

- Water Treatment Technician
- Water Treatment Equipment Technician
- Legionella Risk Assessor
- Water Treatment Operations Supervisor

Gateway Readiness

Gateway takes place before the EPA can start. The employer and training provider will review apprentice's' knowledge, skills and behaviours to see if they have met the minimum requirements of the apprenticeship set out in the apprenticeship standard, and are ready to take the assessment. Only apprentices who complete gateway successfully can start the EPA. Gateway pre-requisites are listed in the summary table above. The Gateway Eligibility Form must be completed see Appendix B, WTT Supporting Documents 'Gateway Eligibility Form.'

Recognition of prior learning (RPL)

Energy & Environment Awards does not recognise any apprentice prior learning (RPL) or prior achievement (RPA) for the purpose of amending the assessment requirements of any end-point assessments.

Please refer to Energy & Environment Awards RPL and RPA policy at
Please refer to Energy & Environment Awards RPL and RPA policy at
https://energyenvironmentawards.co.uk/policies-and-fees/

In order for Energy & Environment Awards to award an end-point assessment qualification, the apprentice must successfully complete all required assessment components with Energy & Environment Awards. This means that:

- each of the EPA components must be completed in full with Energy & Environment Awards
- where an apprentice transfers to Energy & Environment Awards from another EPAO they have to undertake the entire EPA with Energy & Environment Awards
- components of the EPA cannot be certificated in isolation
- evidence produced for the portfolio must be related to the time the apprentice is on their apprenticeship programme to demonstrate current practice
- examples used by the apprentice, during the interview, must relate to the time they were on their apprenticeship programme

This does not affect the Gateway requirements which must be met in order for an apprentice to be eligible for end-point assessment.

This does not affect any reasonable adjustments that may be granted.

Section 2: End-point Assessment Components

Component 1: Knowledge Test

Overview

The knowledge test is a computer-based test which consists of 30 multiple-choice questions. Paper-based tests are available on request.

Apprentices have 60 minutes to complete the test. The multiple-choice questions will have four possible answers of which one will be correct.

These questions are mapped to seven core knowledge statements:

- K1. Chemical reactions involved in the corrosion and scaling processes in water systems
- K2. Inhibition methods for the reduction of corrosion of different metals including steel, copper and aluminium in water systems
- K3. Inhibition methods for the reduction of different scale types in specific water systems including cooling towers, steam boilers and manufacturing processes, etc.
- K4. Cell structure of waterborne microbes and the interactions with biocidal products used to control them
- K5. The concepts of flow and heat transfer in water systems and how they affect water treatment processes
- K6. Ion transfer technologies, including resin and membrane-based systems, used to change water quality
- K7. The use of specialised analytical equipment for the testing in field of water samples including digital titration, colorimeters and photometers

Apprentices must demonstrate that they have an understanding of all core knowledge statements. They will need to answer **at least one question correctly within each group of questions** mapped to each of the core knowledge statements.

A Fail is awarded if the apprentice has not achieved at least one mark against each of the core knowledge statements and/or has achieved 17 or less correct answers.
The Pass mark is 18 correct answers.
The Distinction mark is 25 correct answers.

For this paper:

- access to the internet or intranet is NOT allowed
- apprentices cannot refer to the any reference books or material.

Apprentices must take the test in a quiet space, free from distractions and influence, in the presence of an invigilator.

Knowledge test Coverage

The knowledge test consists of 30 core knowledge questions.
The table below lists each of the knowledge elements, assessed in the knowledge test. Amplification and Guidance can be found in the table below.

Number of Questions	Knowledge	Amplification and Guidance (where required)
4-5	**K1**. Chemical reactions involved in the corrosion and scaling processes in water systems	1.1 Chemical reactions: Corrosion: • electrochemical - Galvanic • non-electrochemical – stress • non-electrochemical – physical • non-electrochemical – cavitation • non-electrochemical – dissolution 1.2 Chemical reactions: Scaling • the conversion of soluble calcium bicarbonate into less soluble calcium carbonate by the removal of dissolved carbon dioxide from solution by increasing temperature, • the conversion of soluble calcium bicarbonate into less soluble calcium carbonate by the removal of dissolved carbon dioxide from solution by increasing pH

Number of Questions	Knowledge	Amplification and Guidance (where required)
		• the conversion of soluble calcium bicarbonate into less soluble calcium carbonate by the removal of dissolved carbon dioxide from solution by reducing pressure 1.3 Stability Indices for prediction of water characteristics: • Langelier Saturation Index (LSI) • Ryznar Stability Index (RSI)
4-5	**K2**. Inhibition methods for the reduction of corrosion of different metals including steel, copper and aluminium in water systems	Corrosion inhibition methods: 2.1 Oxygen removal 2.2 Chemical inhibitor – the use of anodic, cathodic and general film formers 2.3 Galvanic table 2.4 pH
4-5	**K3**. Inhibition methods for the reduction of different scale types in specific water systems including cooling towers, steam boilers and manufacturing processes, etc.	3.1 Scale Inhibitors: natural scale inhibitors, synthetic scale inhibitors 3.2 Chemical scale inhibition: threshold inhibitors; chelating agents; controlling LSI (Langelier Saturation Index), dispersants, antiscalants

Number of Questions	Knowledge	Amplification and Guidance (where required)
		3.3 Physical methods: water softening, filtration, blowdown, Reverse Osmosis (RO), magnetic; electrolytic; electronic; high pressure/temperature generation; electrostatic 3.4 Operational practices: control pH, regular cleaning, monitoring
4-5	**K4**. Cell structure of waterborne microbes and the interactions with biocidal products used to control them	4.1 Cell structure and division: • basic types of cell structure: cell wall, cytoplasmic membrane, chromosome, plasmid, ribosome, flagella, inclusion body, pili • waterborne microbes and their cell structures • types of cell division 4.2 Waterborne microbes: • types of organism commonly found in water systems such as bacteria, viruses, protozoa, parasites, algae, moulds fungi, yeasts • examples of microbe types • terms relating to microbes e.g. planktonic, sessile, eukaryote, prokaryote, gram-positive and gram-negative bacteria, aerobic, anaerobic

Number of Questions	Knowledge	Amplification and Guidance (where required)
		• importance of habitat and nutrient source in microbiological growth • process of biofilm formation • importance of biofilm control 4.3 Biocidal products: • different types of chemical biocides available e.g. oxidizing agents, non-oxidising agents and their advantages, disadvantages • mode of operation of oxidising and non-oxidising biocides • reason for chemical biocide alternation • effect of pH and redox potential and temperature on the efficacy of biocides
4-5	**K5**. The concepts of flow and heat transfer in water systems and how they affect water treatment processes	5.1 The concept of flow in water systems • Impacts of flow rate • Types of flow - Use of Reynolds number to determine flow type 5.2 The concept of heat transfer in water systems • Impact of flow types on heat transfer

Number of Questions	Knowledge	Amplification and Guidance (where required)
		• Heat transfer by latent heat loss/gain 5.3 How flow affects water treatment processes in water systems • Impacts of varying flow rates on water temperature, formation of settled solids, biofilm growth, filtration, disinfection, etc 5.4 How heat transfer affects water treatment processes in water systems • Impacts of heat transfer such as on solubility, pH, temperature, disinfection
4-5	**K6**. Ion transfer technologies, including resin and membrane-based systems, used to change water quality	6.1 Ion transfer technologies: resin - cation exchange 6.2 Ion transfer technologies: resin - anion exchange 6.3 Ion transfer technologies: membrane-based - reverse osmosis 6.4 Ion transfer technologies: membrane-based - electrodeionization (EDI) Water quality changes include: • water softening • water purification • decontamination

Number of Questions	Knowledge	Amplification and Guidance (where required)
4-5	**K7**. The use of specialised analytical equipment for the testing in field of water samples including digital titration, colorimeters and photometers	7.1 The use of digital titration and other titrimetric methods 7.2 The use of colorimeters 7.3 The use of photometers 7.4 The use of conductivity meters 7.5 The use of pH meters 7.6 The use of field microbiological testing methods 7.7 The use of corrosion monitoring methods 7.8 The use of temperature monitoring equipment 7.9 The use of flow monitoring devices 7.10 The use of standards and guidance

Knowledge test Roles and Responsibilities

Role	Responsibility
Invigilator	Is typically provided by the employer or training provider. Attend induction training as directed by Energy & Environment Awards. Not invigilate an assessment, solely, if they have delivered the assessed content to the apprentice. Invigilate and supervise the apprentice during tests and in breaks during assessment methods to prevent malpractice in line with Energy & Environment Awards invigilation procedures.
Employer/Training Provider	Ensure that the knowledge test is scheduled with Energy & Environment Awards for a date and time which allow the apprentice to be well prepared.
Energy & Environment Awards	Arrange for the knowledge test to take place, in consultation with the employer/training provider. Mark knowledge test answers accurately according to the mark scheme and procedures.

Component 2: Observation

Overview

In an observation, an independent assessor, appointed by Energy & Environment Awards, observes an apprentice completing a specified task relating to their relevant job role. The task should be completed in the apprentice's usual place of work, under normal working conditions.

In the role of:

- **Water Treatment Technician** the apprentice must be observed presenting the results and recommendations of a water analysis to the customer
- **Water Treatment Equipment Technician** the apprentice must be observed servicing a piece of water treatment equipment e.g. water softeners, reverse osmosis, chemical dosing equipment, control equipment, filtration equipment, water pumps, water tank and pipework installations and modifications
- **Legionella Risk Assessor** the apprentice must be observed carrying out a tank inspection
- **Water Treatment Operations Supervisor** the apprentice must be observed supervising a team carrying out a water treatment operation

The apprentice must be allowed to synoptically demonstrate the application of the relevant core and specific job role knowledge, skills and behaviours (KSBs) through naturally occurring evidence. The independent assessor will ask questions before or during the observation. To remain as unobtrusive as possible, the independent assessor will ask questions during natural breaks between tasks and after completion of work rather than disrupting the apprentice's flow.

In advance of the assessment, the employer is responsible for advising Energy & Environment Awards of facilities available on the observation site and any site-specific requirements such as access arrangements, safety inductions, PPE.

Step-by-Step Guide

The table below provides a step-by-step guide on how the observation will be carried out:

Assessors	1 independent assessor, appointed by Energy & Environment Awards.
Practical structure	Observations are carried out over a maximum total assessment time period of 2 hours (+/- 10%) within a single day. Apprentices are directly observed by the independent assessor on a one-to-one basis. Apprentices will be provided with a written brief detailing the task(s) they must complete. There may be breaks during the observation to allow the apprentice to move from one location to another and for meal/comfort breaks. During these breaks, the clock will be stopped and then restarted to ensure that the assessment duration is not reduced. **See pages [19-42] for the full list of KSBs to be covered in the observation**
Where will the assessment take place?	The observation must be conducted: • in the apprentice's normal place of work in a suitable area provided the apprentice can work unhindered and without gaining advantage from others
What are the tasks that will be covered?	The assessment task must allow the apprentice to undertake the activities. For further details refer to 'Knowledge, Skills and Behaviours (KSBs) Coverage' below pages [19-42]. The observation must also allow the apprentice to demonstrate the behaviours listed in the next section.
Who sets the task(s)?	Energy & Environment Awards set the task based on the guidance provided in this Specification and information requested from the employer.

	Energy & Environment Awards will work with the employer and/or training provider to • get information on facilities available on site and any site-specific requirements such as access arrangements, safety inductions, PPE • request relevant company documentation e.g. company procedures, processes, practises, RAMS, handbooks and policies The apprentice will be provided with both written and verbal instructions by the independent assessor on the tasks.
What resources can the apprentice use?	The resources needed for the observation must be provided by the employer or training provider and include: • a suitable premises • the equipment and PPE required for the job and in good and safe working condition • equipment certification, where applicable, e.g. calibration certificates, PAT tests, ladder inspections, scafftags Relevant work instructions/manuals must be available in hard copy or electronically or hard copy.
How many questions will the apprentice be asked?	The independent assessor: • will ask three open questions to assess the related underpinning knowledge and assess those knowledge, skills and behaviours that did not naturally occur during the observation • may ask follow-up questions in order to seek clarification
What will the questions focus on?	Underpinning knowledge and/or skills and behaviours where an opportunity to observe them has not occurred.
Grading	Fail or Pass

Observation Knowledge, Skills and Behaviours (KSBs) coverage

The observation covers:

Observation Elements: Core Skills	Amplification and Guidance
S1. Understand, comply with and implement statutory health and safety regulations with regard to the tasks being undertaken.	Regulations include: • relevant health and safety law and environmental regulations, COSHH, Codes of Practice, British, European and International standards, company procedures, site procedures The apprentice will be expected to demonstrate the following appropriate activities for the task and pathway • work safely at all times • comply with the health, safety and environmental requirements relevant to the site • ensure that safe working practices are present and up to date • ensure environmental hazards are identified and controlled
S2. Understand and implement organisational safety requirements for themselves and others, including responsibility and supervision for safe	The apprentice will be expected to demonstrate the following appropriate activities for the task and pathway: • present to workplace prepared for task to be carried out • comply with any site requirements, such as sign in, site inductions

Observation Elements: Core Skills	Amplification and Guidance
access to water systems and the handling of chemicals.	• comply with the health, safety and environmental requirements set out by the organisation relevant to the site • follow the organisational procedures that are appropriate to the operation being undertaken • identify whether others, who may be affected by this activity, need to be informed • identify site specific method statements for the work tasks to be completed in accordance with company operating procedures • obtain required work permits and follow isolation procedures where required • ensure chemical safety data sheets are available and displayed as appropriate • ensure correct Personal Protective Equipment (PPE) is selected and used by all in the workplace, and that it is appropriate for the work being carried out • ensure PPE is maintained in accordance with company policy • ensure correct Safe Access Equipment (SAE) is selected and used by all in the workplace, and that it is appropriate for the work being carried out

Observation Elements: Core Skills	Amplification and Guidance
	• ensure SAE is maintained in accordance with company policy • ensure all incidents and accidents are responded to in accordance with site and company procedures • ensure safety audits are carried out in accordance with company policy • complete documentation in accordance with company operating procedures • provide documentation to the relevant people
S3. Maintain a safe environment for other building occupants during water treatment operations including any relevant signage and notifications.	The apprentice will be expected to demonstrate the following appropriate activities for the task and pathway: • report to site contact, before commencement, agree the work plan • make other occupants of the building, who may be affected by the work, aware • report any changes or issues immediately to site contact • obtain all relevant documentation, such as site work permits, company procedures, tools, equipment and materials • prepare work area and ensure that it is safe for the planned activities • display signage in the work area and cordon off the area as appropriate • maintain effective working relationships with colleagues and supervisors

Observation Elements: Core Skills	Amplification and Guidance
	• apply appropriate behaviours such as teamwork, positive attitude, ethical and honest behaviours, responsibility and commitment • work responsibly complying with Health and Safety and environmental policies and procedures • work in a sustainable manner and ensure any waste is disposed of correctly • ensure area is clean and tidy on completion of the activities
S6. Complete work task risk assessments and develop work plans and method statements for the task(s) involved.	The apprentice will be expected to demonstrate the following appropriate activities for the task and pathway: • complete work task risk assessment in accordance with company procedures • produce and ensure that company method statements are adhered to • produce a work plan, identify required samples, tests, or application points within the system • produce and ensure that equipment manufacturer method statements, where appropriate, are adhered to
S7. Ensure the suitability and correct operating condition of resources and equipment for the work tasks involved. This can include test	The apprentice will be expected to demonstrate the following appropriate activities for the task and pathway:

Observation Elements: Core Skills	Amplification and Guidance
equipment, chemical dosing equipment, water pumps and other specialised equipment.	• inspect tools and equipment to ensure there is no damage and that they function correctly • where appropriate check test equipment is in a serviceable condition and has been calibrated • check electrical equipment PAT tested • check chemical reagents used for testing are in date • check access equipment safety inspection such as Scafftags
S8. Identification of suitable sampling and application points in a water system	The apprentice will be expected to demonstrate the following appropriate activities for the task and pathway: • sample in accordance with relevant standards, codes of practice and company procedures • identify samples from the work plan • identify that all the required resources and documentation are available and have been correctly prepared in accordance with relevant workplace procedures • identify that the correct sampling equipment is available and in serviceable condition • take the samples identified in the plan using the correct organisational procedures

Observation Elements: Core Skills	Amplification and Guidance
	• progress the samples in accordance with the work plan • ensure that the conditions for sample collection adhere to the sampling plan • deal with variations to sampling conditions and contingencies following organisational procedures • control the sampling conditions in accordance with the relevant procedures such as health and safety; environment; time; recording systems; cleanliness; any external influences giving rise to variations • stabilise and maintain the sample for conveyance in accordance with the relevant procedures • label and record information about the sample accurately and legibly using documentation in line with company procedures • progress the sample to the point of analysis in accordance with the work plan
S11. Application of water treatment programmes to specific water system types e.g. cooling towers, steam boilers, heating and chilled systems etc.	Water treatment programmes can include for any water system: chemical and non-chemical processes, monitoring and inspection, sampling, equipment provision and servicing, legionella risk assessment, cleaning operations, remedial engineering works, other products and services associated with water systems.

Observation Elements: Core Skills	Amplification and Guidance
	The apprentice will be expected to demonstrate the following appropriate activities for the task and pathway: • produce a water treatment programme to meet system and regulatory requirements utilising design models includes chemical, microbiological, mechanical, physical • produce a programme of control measures to maintain the efficacy of the treatment programme in accordance with codes of practice and company operating procedures includes physical, engineering, chemical, microbiological, monitoring, inspection as defined in the programme design • apply the water treatment programme for the system involved • take required samples in accordance with company procedures. • complete any required tests in accordance with company method statements • identify and assess system conditions relevant to the water treatment programme • assess the performance of the treatment programme in accordance with company operating procedures

Observation Elements: Core Skills	Amplification and Guidance
	• investigate faults and errors in the system in accordance with company operating procedures • identify and progress a programme of corrective actions in accordance with company operating procedures • record information and write report using company documentation in accordance with company operating procedures • provide the documentation to the relevant people, as defined in the programme design, logbook and company procedures
S12. Interpretation of test results and development of treatment programme improvements and recommendations	The apprentice will be expected to demonstrate the following appropriate activities for the task and pathway: • identify performance criteria from the treatment programme, includes service delivery, chemical, physical, microbiological and water quality control parameters • establish performance criteria are correct to agreed company standards • identify the method of performance appraisal to be used such as chemical testing, temperature monitoring • ensure all resources required are available and/or installed includes, company documentation, performance monitoring equipment, electronic input device, writing materials

Observation Elements: Core Skills	Amplification and Guidance
	• ensure correct operation of performance monitoring equipment in accordance with company operating procedures, test equipment in good order, reagents in date, meters calibrated, test methods available • collect any samples and complete any testing required for assessment • gather all performance data required • identify any data not available and report in accordance with company operating procedures • compare test results with specified control limits for the treatment programme • interpret the test results to determine any faults and errors in the water treatment programme • identify and progress any corrective actions in accordance with company procedures • complete the assessment of the performance of water systems programme • record the outcome of comparison in accordance with company operating procedures • identify and progress a programme of corrective actions in accordance with company operating procedures

Observation Elements: Core Skills	Amplification and Guidance
	• complete documentation in accordance with company operating procedures • present treatment results and discuss recommendations with the customer
S15. Communicate effectively. Use oral, written, electronic and IT based methods and systems for the accurate communication of technical information to other staff involved and all levels of site management. Review this information and agree actions with the relevant people involved. This can include the use, management and training with regard to electronic log systems for the storage of water system sampling and analytical results, practical demonstration of testing procedures and presentation of reports	The apprentice will be expected to demonstrate the following appropriate activities for the task and pathway: • collect and collate all data relevant to the tasks being reviewed, such as test results, calculations, conditions of test, out of specification results • identify and communicate with the relevant site contact(s) • identify any changes and/or improvements to the water treatment programme that are required. confirm and agree any corrective and/or preventive actions that are required • identify and progress a programme of corrective actions in accordance with company operating procedures • complete company documentation in accordance with company operating procedures • present the documentation to the relevant people as defined in the programme design, logbook or company procedures

Observation Elements: Core Behaviours	Amplification and Guidance
B1. Act professionally demonstrating dependability, determination, honesty and integrity. Respect others, act ethically and contribute to sustainable development.	The apprentice will be expected to demonstrate the following appropriate activities for the task and pathway: • be proactive, take pride in their presentation, their company and their work • be prepared to be flexible • be respectful of colleagues and site personnel • demonstrate the understanding to manage own responsibilities with regards to work time, quality and targets
B2. Be risk aware so as to help reduce risks by checking of information, concentration on the task, and awareness of changing circumstances on activity.	The apprentice will be expected to demonstrate the following appropriate activities for the task and pathway: • comply with all health and safety requirements, both own company and site procedures • display, as appropriate, signage, data sheets • maintain the work area is a safe, clean and tidy condition and dispose of waste sustainably • check integrity of all equipment before use • always remain vigilant and take immediate action to any issues or concerns which may arise • ask for advice if in doubt

Observation Elements: Core Behaviours	Amplification and Guidance
B4. Be prepared to work reliably and safely and supervise the safe and effective operation of others.	The apprentice will be expected to demonstrate the following appropriate activities for the task and pathway: • comply with all health and safety requirements, both own company and site procedures • communicate relevant information to all colleagues who require it • communicate with other personnel in the immediate area who may be affected by the task • supervise the actions of colleagues during work tasks • ensure that the outputs of the work task risk. assessment and method statement are adhered to • display signage, data sheets and cordon the area if required

Pathway: Water Treatment Technician Specific Skills	Amplification and Guidance
WTT S3. Give presentations and demonstrations to customer/site personnel regarding treatment recommendations and control requirements	The apprentice will be expected to demonstrate the following appropriate activities for the task and pathway: • establish the presentation or demonstration to be given • confirm that the presentation or demonstration to be given is within own limitations of knowledge and experience of the water treatment industry

Pathway: Water Treatment Technician Specific Skills	Amplification and Guidance
	• ensure all resources required for the presentation or demonstration are available • prepare all demonstration materials for use • ensure that presentations or demonstrations take place in a safe environment and allow learners to see the presentation or demonstration clearly • assess attendees' current level of knowledge and experience of the water treatment industry in accordance with organisational procedures • assess attendee's learning needs in accordance with organisational procedures • instruct attendees, by presentation or demonstration in accordance with company operating procedures, on what to do or how to carry out a particular task(s) in the water treatment industry • confirm, in accordance with company operating procedures, that the attendee(s) knows what to do or can carry out the particular task in the water treatment industry • complete the relevant company documentation in accordance with company operating procedures

Pathway: Water Treatment Technician Specific Skills	Amplification and Guidance
	• provide the documentation to the relevant people
WTT S5. Organise, construct, manage and report review meetings with customers/site personnel	The apprentice will be expected to demonstrate the following appropriate activities for the task and pathway: • identify and communicate with the relevant site contact(s) • collect and collate all data relevant to the tasks being reviewed • produce and present the data in accordance with company operating procedures • provide the data to the relevant people in accordance with company operating procedures • identify any changes and/or improvements to the water treatment programme that are required • confirm and agree any corrective and/or preventive actions that are required • establish and agree objectives for the next review period • complete documentation in accordance with company operating procedures • provide documentation to the relevant people

Pathway: Water Treatment Equipment Technician Specific Skills	Amplification and Guidance
WTE S3. b. Service a piece of water treatment equipment	The apprentice will be expected to demonstrate the following appropriate activities for the task and pathway: • produce and ensure that equipment manufacturer and company method statements are adhered to • identify the equipment to be serviced, produce a work plan, and agree procedure for taking equipment out of service and returning to service • ensure any test equipment and tools required for the task are available, in a serviceable condition and where necessary have been calibrated. • any chemical reagents required for testing are in date • take any required samples and test in accordance with company procedures • carry out service of the equipment including replacement of consumable parts, cleaning sensors, cleaning filters etc and carry out operational test on completion, in accordance with manufacturer and company procedures • identify and progress any corrective actions in accordance with company procedures

Pathway: Water Treatment Equipment Technician Specific Skills	Amplification and Guidance
	• complete a service report using company documentation and discuss recommendations with the customer • ensure the workplace is left as originally found and arrange for removal and disposal of any waste materials in accordance with company procedures
WTE S4. Assess the performance of a water system treatment programme	The apprentice will be expected to demonstrate the following appropriate activities for the task and pathway: • identify performance criteria from the treatment programme • establish performance criteria are correct to agreed company standards • identify the method of performance appraisal to be used • ensure all resources required are available and/or installed • ensure correct operation of performance monitoring equipment in accordance with company operating procedures • collect any samples required for assessment • complete any testing required for assessment • gather all performance data required • identify any data not available and report in accordance with company operating procedures

Pathway: Water Treatment Equipment Technician Specific Skills	Amplification and Guidance
	• compare data to performance criteria • record the outcome of comparison in accordance with company operating procedures • complete company documentation in accordance with company operating procedures • present the documentation to the relevant people

Pathway: Legionella Risk Assessor Specific Skills	Amplification and Guidance
LRA S1. Carry out site/system investigations and surveys	The apprentice will be expected to demonstrate the following appropriate activities for the task and pathway: • safely carry out water storage tank investigation/survey in accordance with company procedures • provide a justifiable residual risk rating – along with reasoning • make reasonable recommended remedial actions as appropriate

Pathway: Legionella Risk Assessor Specific Skills	Amplification and Guidance
	• suggest a recommended water hygiene control regime, along with checks to be carried out on an ongoing basis (in accordance with recognised guidance and as determined by the risk assessment) • provide a justifiable ALARP (as low as reasonably practicable) risk rating – along with reasoning, if all recommendations were to be carried out • communicate all of the above in a clear and concise manner
LRA S5. Prepare and present the assessment report findings to customer/site personnel	Presentation e.g. verbal, written, digital media, online The apprentice will be expected to demonstrate the following appropriate activities for the task and pathway: **Prepare** • establish the relevant site contact(s) for the review procedure • confirm the scope of the assessment/review • complete all site/plant area access procedures as necessary • complete/review work task dynamic risk assessment • ensure resources are available and operational

Pathway: Legionella Risk Assessor Specific Skills	Amplification and Guidance

	• note any additional items that may need to be recorded as part of the survey process
	• collect and collate all data relevant to the tasks being reviewed in accordance with company operating procedures
	• establish the correct method of presentation
	Present
	• establish the correct method of presentation to meet the organisational procedures
	• complete documentation in accordance with company operating procedures e.g.
	  ○ dynamic task risk assessment
	  ○ site survey form(s)
	  ○ key findings of survey, reporting by exception any non-conformances (with recognised guidance)
	  ○ a justifiable residual risk rating – along with reasoning
	  ○ recommended remedial actions
	  ○ recommended water hygiene control measures and checks to be carried out on an ongoing basis

Pathway: Legionella Risk Assessor Specific Skills	Amplification and Guidance
	○ a justifiable ALARP risk rating – along with reasoning • provide documentation to the relevant people • discuss with the customer how recommended remedial actions and changes to management controls identified in the risk assessment can be implemented
LRA S6. Review the implementation of remedial actions recommended in the risk assessment e.g. pipework changes, insulation and review the employment of management controls e.g. temperature monitoring programmes, system analysis results	The apprentice will be expected to demonstrate the following appropriate activities for the task and pathway: • identify the data relevant to the tasks that are being reviewed • review performance against a set of agreed criteria • identify equipment / plant items to be inspected, and re-check against site method statement • safely follow the task method statement • inspect the plant equipment to be assessed, where safe to do so • record design, condition, and any other relevant items • identify any changes to the water treatment programme • identify improvements, corrective and/or preventive actions

Pathway: Legionella Risk Assessor Specific Skills	Amplification and Guidance
	• identify non-conformances with the design, construction and condition of the tank(s)

Pathway: Water Treatment Operations Supervisor Specific Skills	Amplification and Guidance
WTS S1. Complete water system surveys and produce system diagrams appropriate for the direction and management of a cleaning/ disinfection project	The apprentice will be expected to demonstrate the following appropriate activities for the task and pathway: • carry out the survey in accordance with company operating procedures • identify any samples or tests that need to be completed for the survey • identify any resources that are required for the survey • identify that any equipment selected is appropriate to the survey / diagram • establish that all resources are ready and available • check that any relevant equipment required for the survey is in serviceable condition • complete any sampling in accordance with the survey programme • complete any on-site tests in accordance with the survey programme.

Pathway: Water Treatment Operations Supervisor Specific Skills	Amplification and Guidance
	• ensure the workplace is left as originally found • establish the production format of the system diagram • produce system diagram(s) in accordance with regulations and guidelines and within an agreed timescale • complete system diagram(s) in accordance with the agreed format, presentation method and company procedures • provide system diagrams to the relevant person(s)
WTS S3. b. Service temporary operations equipment required to complete the project e.g. flushing pump stations, side stream filtration, cooling tower packing	The apprentice will be expected to demonstrate the following appropriate activities for the task and pathway: • ensure that all required resources are available and in operating condition • take equipment out of duty in accordance with the company procedure • complete the service in accordance with company operating procedures • deal with any contingencies in line with company policy • identify any corrective actions required and complete in accordance with company operating procedures • return equipment to duty in accordance with the company procedure

Pathway: Water Treatment Operations Supervisor Specific Skills	Amplification and Guidance
WTS S5. Supervise a team of Water Treatment Operatives and any associated subcontractors.	The apprentice will be expected to demonstrate the following appropriate activities for the task and pathway: • ensure the group work safely at all times and comply with health and safety procedures • establish that all staffing levels are appropriate for the work activity • establish that personnel have the correct skills and knowledge for the work task • establish that the competence of relevant colleagues are appropriate to the work task • review personnel competence in accordance with agreed procedures • communicate relevant information to all colleagues who require it • supervise the actions of colleagues during work tasks • ensure that the outputs of the work task risk, assessment and method statement are adhered to • deal promptly and effectively with problems that are their responsibility and are within their knowledge and experience • report any problems that they cannot solve in accordance with company operating procedures

Pathway: Water Treatment Operations Supervisor Specific Skills	Amplification and Guidance
	• supervise the safe collection and disposal of any waste produced • supervise the cleaning and storage of any equipment used • complete company documentation in accordance with company operating procedures • provide the documentation to the relevant people • ensure the workplace is left as originally found

Observation Roles and Responsibilities

Role	Responsibility
Independent Assessor	Provide written and verbal instructions for the observation. Record and report assessment outcome decisions for each apprentice, following instructions and using assessment recording documentation provided by Energy & Environment Awards.
Employer/Training Provider	In advance of the assessment, the employer is responsible for: • liaising with the training provider to ensure that the apprentice is prepared for the observation • providing the venue and task suitable for the apprentice to achieve all elements of the assessment • providing the apprentice with all required tools, equipment, PPE and all other resources that may be required to complete the task • advising Energy & Environment Awards in advance to allow arrangements for the observation to take place • providing Energy & Environment Awards with copies of method statements and company documentation the apprentice may require to complete the task • advising Energy & Environment Awards of facilities available on site and any site-specific requirements such as access arrangements, safety inductions, PPE
Energy & Environment Awards	Arrange for the observation to take place, in consultation with the employer/training provider and independent assessor.

Component 3: Professional Discussion Supported by a Portfolio

Overview

The professional discussion is based on the apprentice's portfolio of evidence and focuses on the KSBs on pages 47 - 76. The professional discussion allows for testing of responses where there are a range of potential answers.

The portfolio, compiled throughout the apprenticeship and completed by Gateway must be submitted to Energy & Environment Awards.

Step-by-Step Guide

The table below provides a step-by-step guide on how the professional discussion supported by a portfolio of evidence will be carried out:

Assessors	1 independent assessor approved by Energy & Environment Awards will conduct the professional discussion.
Professional Discussion (supported by a portfolio) structure	**Types of questions:** • The assessor will ask a minimum of 19 open questions to explore the apprentice's level of knowledge, skills and behaviours • Standardised open questions will be asked based on the contents of the evidence in the portfolio • Additional follow up questions are allowed, to seek clarification. **Locations:** Employer's premises or a suitable venue for example a training provider's premises. **Time:** 90 minutes. The independent assessor has the discretion to increase the time of the professional discussion by up to 9 minutes, to allow the apprentice to complete their last answer **The professional discussion will be:** • conducted by 1 independent assessor • face to face or remote, as agreed

	• recorded in writing using the professional discussion record template provided by Energy & Environment Awards • video recorded using relevant technology such as Microsoft Teams or an audio recording device • conducted under examination conditions The apprentice will have access to their portfolio of evidence throughout the professional discussion. Portfolio of evidence: • The apprentice's Manager/Mentor will typically support the development of the evidence portfolio in accordance with company policy and procedures • See 'Portfolio of Evidence Requirements' guidance below on the content of evidence • The portfolio must contain sufficient quality evidence relating to each element of the standard covered by the professional discussion. Typically, this will be contained in small number of job write-ups produced towards the end of the training periods • Although questioning will cover ALL the elements of the standard (listed below in this section of the Specification), they will prioritise areas according to what they see in the portfolio
What topics will be covered?	For further details refer to 'Knowledge, Skills and Behaviours (KSBs) Coverage below pages [47-76].
When will the portfolio of evidence be referred to?	The portfolio of evidence: • will be reviewed by the independent assessor before the professional discussion • can be referred to by the apprentice to illustrate their answers

	Note: the portfolio of evidence is not directly assessed.
Grading	Fail, Pass or Distinction

Portfolio of Evidence Requirements

The requirements are as follows:

Portfolio Mapping Document The apprentice must map their portfolio of evidence to the KSBs as this evidence will be used by the independent assessor to assess the apprentice during the professional discussion. the portfolio mapping document must be clearly referenced and included at the front of the portfolio. For further guidance on mapping refer to: • Section 5 Practice Guidance on portfolio of evidence and apprentice mapping • Appendix D, WTT Supporting Documents 'Portfolio Mapping Document.'
How will the training provider submit the apprentice's Portfolio to Energy & Environment Awards? As part of the pre-requisite gateway requirements the apprentice must have compiled and submitted a portfolio of evidence that includes a portfolio mapping document (placed at the front of the portfolio), which the professional discussion will be based on.

Professional Discussion Knowledge, Skills and Behaviours (KSBs) coverage

The professional discussion based on portfolio of evidence covers:

Professional Discussion Elements: Core Skills	Amplification and guidance
S4. They should be able to contribute to the development of operational solutions and improvements e.g. safer working practices	In their portfolio apprentices must include at least two examples of where they have contributed to the development of operational solutions and improvements. Apprentices should be able to: • evidence areas for task improvements • evidence hazards encountered and actions taken • outline company procedures regarding corrective actions • reference Codes of Practice relevant to task • demonstrate compliance with safety, health and environmental requirements in the workplace • evidence generation of site specific work task risk assessments • evidence generation of site specific method statements • identify the risks to the environment arising as a result of workplace activities

Professional Discussion Elements: Core Skills	Amplification and guidance
S5. Gather system data to enable the correct selection of operational resources that may be required e.g. access equipment (ladders, scaffold or cherry picker).	**System data** includes handwritten, typed, digital media, on-line **Data** includes actions, system data, test results, certification, training, specification, procedures, method statements, product data In their portfolio apprentices should evidence selection of equipment and resources required for the task
S9. Assessment of relevant test parameters and sampling plan for specific water systems	**Tests** include: chemical, physical, mechanical and microbiological Apprentices should be able to: • describe parameters and tests to be completed e.g. temperature, pH, conductivity, ORP, turbidity, titrations, dipslides, laboratory parameters e.g. BOD (Biochemical Oxygen Demand), legionella, as specified in company method statements, procedures and relevant codes of practice. • describe relevant features of sampling plans include time, frequency, sequence, location and methodology

Professional Discussion Elements: Core Skills	Amplification and guidance
S10. Performance assessment and evaluation of water system conditions and operations utilising specific monitoring equipment	**Water system conditions** includes service delivery, chemical, physical, microbiological and water quality control parameters, detailed in company method statements, procedures and relevant codes of practice **Operations** can include for any water system: chemical and non-chemical processes, monitoring and inspection, sampling, equipment provision and servicing, legionella risk assessment, cleaning operations, remedial engineering works, other products and services associated with water systems Apprentices should be able to describe: • how to prepare and test samples and explain how to calculate test results in accordance with company procedures • how to prepare check and calibrate test equipment in accordance with company procedures e.g. dipslides, corrosion coupons, corrators, meters, data loggers, test equipment
S13. Identify, evaluate and resolve practical and technical problems encountered, assess suitability of the chemical and physical water treatment	**Problems encountered** such as: scale, corrosion, fouling, microbiological, chemical, mechanical, environmental

Professional Discussion Elements: Core Skills	Amplification and guidance
options employed and implement the required improvements to the treatment programme or service delivery	**Problems** associated with type and design of water system **Chemical and physical water treatment options** include scale inhibition, corrosion inhibition, biofouling inhibition, control of suspended solids Apprentices should be able to: • explain the company procedures relevant to assessing the performance of water systems programme • describe what the control parameters are for the treatment programme • describe where any relevant performance data can be obtained • describe the performance criteria relevant to the parameters involved • explain how to compare data and criteria • describe how to assess the most suitable corrective action in accordance with organisational procedures
S14. Use resources effectively including their own time management, the appropriate competence of staff chosen for the operation involved, the	Apprentices should evidence: • an ability in organising the task and deployment of personnel in the most safe and efficient way. • a review of training and competence certificates for staff involved

Professional Discussion Elements: Core Skills	Amplification and guidance
efficient use of staff resources and management of equipment required for specific work tasks	• a review of equipment to be used in completing the task e.g. scafftags, ladder checks, PAT test certificates for portable appliances, calibration certificates etc
S16. Maintain level of competence commensurate with job role. Identify and recognise personal training needs and undertake suitable training when required. Complete and record CPD necessary to maintain and enhance competence	In their portfolio apprentices should be able to evidence: • training records • relevant courses attended • tasks completed • employment review/appraisals records

Professional Discussion Elements: Core Behaviours	Amplification and guidance
B3. Display a self-disciplined, self-motivated, proactive approach to work, willing to make independent decisions and develop solutions and improvements to work practices	Apprentices should be able to demonstrate: • how they are focussed on the task, leading by example • examples of accountability, discipline, honesty, humility, integrity, organisation In their portfolio apprentices should be able to evidence: • employment review records

Professional Discussion Elements: Core Behaviours	Amplification and guidance
	• records of improvements e.g. corrective action reports in accordance with company procedures
B5. Be prepared to work effectively and efficiently maintaining good relationships with colleagues, clients, suppliers and the public.	Apprentices should be able to demonstrate: • time management and organising the task • communication skills – following company procedures
B6. Be receptive to feedback, willing to learn new skills and adjust to change.	In their portfolio apprentices should be able to evidence: • feedback from colleagues, clients, suppliers, public etc, handling positive and negative feedback • examples of new skills, attendance of training courses
B7. Demonstrate adherence to corporate policies on ethics, equality and diversity	Apprentices should be able to demonstrate examples of: • acting professionally, with honesty and integrity • taking responsibility for situations and demonstrate leadership • considering all people equally and without prejudice or favour • being respectful of others and acknowledge and embrace alternative opinions • being aware of discrimination and unconscious bias

Water Treatment Technician Role Specific Knowledge and Skills	Amplification and Guidance
WTT K1. Understand the water treatment requirements of specific water systems e.g. steam boilers, cooling towers etc.	Water treatment programmes can include for any water system: chemical and non-chemical processes, monitoring and inspection, sampling, equipment provision and servicing, legionella risk assessment, cleaning operations, remedial engineering works, other products and services associated with water systems Apprentices should be able to: • describe the approved codes of practice/working practices relevant to the operation and explain why it is important to follow them. Approved codes of practice/working practices include ACOPs, Standards, guidance documents, company procedures and practices RAMS • explain the company procedures relevant to requirements for a water treatment programme for the specific system • describe the information required during a water system survey to enable a water system programme to be designed • describe treatment methods available for the specific water system • describe the control methods which could be used for the water treatment programme

Water Treatment Technician Role Specific Knowledge and Skills	Amplification and Guidance
	• explain what system conditions are relevant to the water system programme
WTT K2. Understand the treatment options available for specific water systems e.g. pre-treatment plant, chemical treatment etc	Apprentices should be able to: • explain the main problems encountered in the water system • describe the applicable water chemistry and microbiology for the water system • explain the importance of any relevant system and regulatory requirements • describe the treatment options and control measures for the specific water system. • describe the equipment, chemicals, dose rates and tests required to apply the correct treatment programme • describe the required treatment conditions, chemical levels, etc. that are required to maintain the specific water system • explain the control limits for the system and the tests required to monitor them to ensure that the correct conditions are maintained • explain risks and implications of failure to follow the correct chemical cleaning procedure

Water Treatment Technician Role Specific Knowledge and Skills	Amplification and Guidance
WTT K3.a. Acquire the knowledge required to assess the performance of water treatment programmes	Water treatment programmes can include for any water system: chemical and non-chemical processes, monitoring and inspection, sampling, equipment provision and servicing, legionella risk assessment, cleaning operations, remedial engineering works, other products and services associated with water systems Apprentices should demonstrate the knowledge required to assess the performance of water systems programme. Apprentices should be able to: • describe the correct equipment to be used for the task • explain what samples are to be taken and why they are required • explain how to take and convey any relevant samples • describe the different types of tests available relevant to the operation and how to complete them • explain how any documentation should be completed and how this should be presented

Water Treatment Technician Role Specific Knowledge and Skills	Amplification and Guidance
WTT K3.b. Acquire the knowledge required to recommend improvements to water treatment programmes	Apprentices should be able to: • describe how to evaluate performance of the water treatment programme • describe where any relevant performance data can be obtained • describe how to compare performance data and criteria • describe how to record the outcome of the comparison • explain any changes and/or improvements to the water treatment programme that are required • explain how any actions are agreed with the relevant people
WTT S1. Design, specify and recommend chemical water treatment programmes taking account of water supply quality and system operating conditions	Apprentices should be able to: • explain the company procedures relevant to the design, specification and recommendation of water treatment programmes • describe where and how to obtain any relevant system design data • describe how to use the relevant data to specify the treatment programme required to meet the specification • describe how the recommendations would be reported

Water Treatment Technician Role Specific Knowledge and Skills	Amplification and Guidance
WTT S2. a. Evaluate the suitability of alternative physical water treatment programmes for specific water systems and applications	Apprentices should be able to: • describe the physical water treatment programme option for the system • explain the suitability of the physical water treatment programme • explain the physical water treatment programme design • explain the calculations for the physical water treatment programme • describe the benefits and drawbacks of the physical water treatment programme • explain the financial implications of the physical water treatment programme
WTT S2. b. Evaluate the suitability of alternative chemical water treatment programmes for specific water systems and applications	Apprentices should be able to: • describe the chemical water treatment programme option for the system • explain the suitability of the chemical water treatment programme • explain the chemical water treatment programme design • explain the calculations for the chemical water treatment programme • describe the benefits and drawbacks of the chemical water treatment programme

Water Treatment Technician Role Specific Knowledge and Skills	Amplification and Guidance
	• explain the financial implications of the chemical water treatment programme
WTT S4. Assess the performance of a water system treatment programmes and provide recommendations for improvement	Apprentices should be able to: • explain the company procedures relevant to assessing the performance of water systems programme • describe the performance criteria relevant to the parameters involved • explain the different methods for establishing performance relevant to the criteria involved • describe where any relevant performance data can be obtained • explain how to compare data and criteria • describe how to record the outcome of the comparison • explain who the relevant people are to receive the completed documentation • explain how recommendations for improvements would be made • explain how actions are agreed with the relevant people

Water Treatment Equipment Technician Role Specific Knowledge and Skills	Amplification and Guidance
WTE K1. Understand the water treatment requirements of specific water applications and processes e.g. water used for pharmaceutical manufacturing, chemical treatment dosing	Water treatment programmes can include for any water system: chemical and non-chemical processes, monitoring and inspection, sampling, equipment provision and servicing, legionella risk assessment, cleaning operations, remedial engineering works, other products and services associated with water systems Apprentices should be able to: • describe the approved codes of practice/working practices relevant to the operation and explain why it is important to follow them. Approved codes of practice/working practices include ACOPs, Standards, guidance documents, company procedures and practices RAMS • explain the company procedures relevant to carrying out a water system survey • describe the information required during a water system survey to enable a water system programme to be designed • explain how to identify which samples and tests are required by the survey programme • describe the relevant resources that are required for the survey

Water Treatment Equipment Technician Role Specific Knowledge and Skills	Amplification and Guidance
	• describe treatment methods available for the specific water system • describe the control methods which could be used for the water treatment programme • explain what system conditions are relevant to the water system programme
WTE K2. Understand the equipment options available and their relevant benefits	Apprentices should be able to: • describe the water treatment equipment options which would be applicable for a specific water treatment application • explain the benefits and drawbacks of different equipment options for the specific application
WTE K3. a. Acquire the knowledge required to install specific items of equipment relevant to their job role	Water treatment equipment includes equipment for ion exchange, reverse osmosis, filtration, chemical dosing and control, microbiological control, settlement and solids removal Apprentices should be able to: • explain the company procedures relevant to the installation of water treatment equipment

Water Treatment Equipment Technician Role Specific Knowledge and Skills	Amplification and Guidance
	• describe how to identify the supplier and design of the equipment to be installed • describe how to obtain manuals, design drawings and installation instructions • describe the resources required for the relevant operation
WTE K3. b. Acquire the knowledge required to service specific items of equipment relevant to their job role	Servicing includes replacement of consumable parts, cleaning of sensors, removal of air locks, cleaning filters, checking correct operation Apprentices should be able to: • explain the company procedures relevant to the servicing of water treatment equipment • describe where to find details of service to be carried out • describe the resources required to complete the service • describe how to service the relevant equipment in accordance with organisational procedures • explain how to confirm correct operation of the water treatment equipment involved

Water Treatment Equipment Technician Role Specific Knowledge and Skills	Amplification and Guidance
WTE K3. c. Acquire the knowledge required to maintain specific items of equipment relevant to their job role	Apprentices should be able to: • describe the specific items of equipment that will be maintained within the limits of the job role • explain company procedures relevant to the equipment being maintained • describe the correct performance criteria for the equipment and the tests that should be carried out • describe the maintenance requirements for the equipment • explain the implications of poor equipment maintenance
WTE S1. Complete water system surveys and produce system diagrams appropriate to the presentation of system data e.g. layout of the treatment plant within the system location	Survey outputs include Risk Assessment, sample and test results, survey forms, mechanical specifications, system objective Apprentices should be able to: • describe any regulations and guidelines relevant to the survey procedure • explain the company procedures relevant to creating a water system diagram • describe the format and presentation method of the system diagram

Water Treatment Equipment Technician Role Specific Knowledge and Skills	Amplification and Guidance
WTE S2. Evaluate and design appropriate water treatment equipment installations	Water treatment equipment includes equipment for ion exchange, reverse osmosis, filtration, chemical dosing and control, microbiological control, settlement and solids removal Apprentices should be able to: • explain how the survey information is used to select the correct equipment for the water treatment application • explain the calculations used to select the equipment to be installed
WTE S3. a. Install and commission water treatment equipment	Apprentices should be able to: • describe who to communicate with on the customer site • explain how to agree a shutdown/startup procedure with site personnel if required for the operation • describe how to install the equipment involved in accordance with installation instructions, method statement and company procedures • describe how to start up and prove the correct operation of the equipment • explain how to complete commissioning of the equipment in accordance with organisational procedures

Water Treatment Equipment Technician Role Specific Knowledge and Skills	Amplification and Guidance
	• explain what waste may be produced and how to collect and dispose of the waste in accordance with company procedures • describe the relevant documentation required on completion and the relevant people to be informed
WTE S5. Supervise a team and manage the health, safety and environment of a water treatment equipment installation and/or operation	Apprentices should be able to: • explain the company procedures relevant to the maintenance of health, safety during an equipment installation • explain the consequences to self and others if health, safety and environment requirements are not followed • explain how to produce a site specific method statement • describe what action to take if there are health, safety and environmental problems within the workplace • explain what to do if there is a problem with portable appliances • describe what safe access equipment should be used • explain how to ensure that equipment is in safe working order • explain how to obtain and select appropriate Personal Protective Equipment (PPE) • describe company procedures regarding safety audits

Legionella Risk Assessor Technician Role Specific Knowledge and Skills	Amplification and Guidance
LRA K1. Know and understand any regulatory requirements and guidance appropriate to the water systems being assessed	Apprentices should be able to: • describe the approved codes of practice/working practices relevant to the operation and explain why it is important to follow them. Approved codes of practice/working practices include ACOPs, Standards, guidance documents, company procedures and practices RAMS
LRA K2. Understand the principles of risk assessment and the identification of hazards in water systems	Apprentices should be able to: • explain how to carry out a legionella risk assessment in accordance with approved codes of practice and company procedures • explain what to consider in evaluating sources of risk in water systems • describe the control measures required for water systems • explain how to manage risk in water systems • explain the requirements of record keeping and the written control scheme • explain when the risk assessment should be reviewed
LRA K3. Understand the application of water treatment programmes for specific water systems	Apprentices should be able to: • describe the treatment process applicable to the water system

Legionella Risk Assessor Technician Role Specific Knowledge and Skills	Amplification and Guidance
	• describe the recommended control measures that can be applied to the water system • describe how the efficacy of the treatment process is monitored
LRA K4. Understand the principles of design for water systems and water treatment equipment e.g. water tanks, calorifiers, softeners etc.	Apprentices should be able to: • explain the problems that can arise in poorly designed water systems • describe the design layout and main components of the water system • explain the impact of materials and components of the system on risk • explain the impact of system design and operation on risk
LRA K5. Acquire the knowledge required to recommend remedial actions, optional system improvements and management requirements	Apprentices should be able to: • describe the limitations of own competence with regard to knowledge and experience • describe emergency procedures required in the event of legionella outbreak • explain which water systems provide a reasonably foreseeable risk of exposure to legionella bacteria • describe what resources are required to complete the risk assessment • explain where to find expert advice and guidance

Legionella Risk Assessor Technician Role Specific Knowledge and Skills	Amplification and Guidance
	• explain what information sources are available relevant to risk assessment • describe the relevant sampling and sampling standards in relation to the risk assessment
LRA S2. Prepare water system diagrams and drawings	Apprentices should be able to: • explain the company procedures for survey of the water system • explain why schematic diagrams are required • describe the requirements of schematic diagrams and asset registers • describe the resources required to survey the water system and complete the diagram • describe the agreed format, and presentation method of the system diagram • describe which components should be included in the system diagram
LRA S3. Assess the comparative risk of Legionellosis presented by specific water systems	Apprentices should be able to: • explain the company procedures relevant to assessing the performance of water systems programme • describe the control parameters for the treatment programme

Legionella Risk Assessor Technician Role Specific Knowledge and Skills	Amplification and Guidance
	• describe the performance criteria relevant to the parameters involved • describe how to compare test results with criteria • describe how to determine the level of risk
LRA S4. Identify remedial, improvement and management actions required to minimise any risk presented	Apprentices should be able to: • describe the factors which should be considered in the risk evaluation • describe the management structure requirements for legionella control • describe who the relevant people are that need to be informed • describe what records are required for the water system • explain possible corrective actions that may be employed for the water system involved and how they should be recommended • explain how to deal with matters of immediate concern in accordance with organisational procedure

Water Treatment Operations Supervisor Role Specific Knowledge and Skills	Amplification and Guidance
WTS K1. Understand the water treatment requirements of specific water systems e.g. drinking water systems, process water systems etc.	**Water treatment programmes** can include for any water system: chemical and non-chemical processes, monitoring and inspection, sampling, equipment provision and servicing, legionella risk assessment, cleaning operations, remedial engineering works, other products and services associated with water systems Apprentices should be able to: • describe the approved codes of practice/working practices relevant to the operation and explain why it is important to follow them. Approved codes of practice/working practices include ACOPs, Standards, guidance documents, company procedures and practices RAMS • explain the company procedures relevant to requirements for a water treatment programme for specific systems • describe the information required during a water system survey to enable a water system programme to be planned • describe treatment methods available • describe the control methods which could be used for the water treatment programme

Water Treatment Operations Supervisor Role Specific Knowledge and Skills	Amplification and Guidance
	• explain what system conditions are relevant to the water system programme
WTS K2. a. Understand chemical cleaning programme options for specific water systems and processes	Apprentices should be able to: • describe the treatment options available, that can be used for the application • describe, e.g. the conditions, chemical levels, that may need to be maintained during the operations • explain how to ensure that system conditions are maintained • describe the chemicals used, dose rates and tests carried out to maintain correct chemical levels • explain risks and implications of failure to follow the correct chemical cleaning procedure
WTS K2. b. Understand disinfection programme options for specific water systems and processes	Apprentices should be able to: • describe the treatment options available that can be used for specific water system disinfection e.g. sodium hypochlorite, hydrogen peroxide • describe the conditions, chemical levels, etc. that they may need to maintain during the operations

Water Treatment Operations Supervisor Role Specific Knowledge and Skills	Amplification and Guidance
	• explain how to ensure that system conditions are maintained • describe the chemicals used, dose rates, tests carried out to maintain correct chemical levels • explain risks and implications of failure to follow the correct disinfection procedure
WTS K3. Acquire the knowledge required to assess the performance of water treatment cleaning/disinfection operation	Apprentices should be able to: • explain the company procedures relevant to applying a water treatment programme for water system cleaning operations that they carry out • describe the different types of water system cleaning operations they carry out • explain the main problems encountered in water system cleaning operations and how they would deal with them. e.g. faulty equipment, no power etc • explain any relevant system and regulatory requirements that need to be considered or adhered to • describe the conditions and chemical levels required during the cleaning operation

Water Treatment Operations Supervisor Role Specific Knowledge and Skills	Amplification and Guidance
	• describe the treatment methods and control measures that can be used for the application • describe the different processes/stages they would use in the order they would normally be carried out during the operation/s • explain the control limits would they work to in each stage e.g. flow rate, temperature, pH, time, chemical levels, etc and how they would monitor them
WTS K4. Understand the risks involved, the relevant Health and Safety regulations associated with the project and specific requirements of the project site	Apprentices should be able to: • explain personal and legal responsibilities with regard to health and safety in the working area • describe the hazards that could be encountered when carrying out cleaning on site • explain when a work task risk assessment should be completed • explain what they and their company would do to reduce risks when they are supervising a cleaning team on site • explain company procedures relevant to the maintenance of health, safety and environment in water management • explain any site specific requirements that are in place

Water Treatment Operations Supervisor Role Specific Knowledge and Skills	Amplification and Guidance
	• explain how to ensure that all equipment used by the team is in safe working order, e.g. access equipment, electrical equipment and PPE
WTS S2. Understand and apply chemical cleaning and disinfection programmes for specific water systems	• describe the different processes/stages they would use in the order they would normally be carried out during the operation • describe how the relevant treatment process is applied e.g. how to dose, frequency of testing, physical/manual cleaning required • explain the control limits they would work to in each stage e.g. flow rate, temperature, pH, time, chemical levels, etc • explain which chemicals/disinfection products would be used • explain dose rates of the products required for treatment • describe the tests carried out to maintain correct chemical levels • explain how they would monitor control limits • explain risks and implications of failure to follow the correct chemical /disinfection procedure
WTS S3. a. Install and commission temporary operations equipment required to complete the project e.g. flushing pump stations, side stream filtration, cooling tower packing	Apprentices should be able to: • describe what equipment is required to carry out the task and how to operate it

Water Treatment Operations Supervisor Role Specific Knowledge and Skills	Amplification and Guidance
	• describe what resources are required for the installation • explain company procedures for installation of temporary equipment • explain shutdown/startup procedure with site personnel if required for the operation of temporary operations equipment • describe how to start up the temporary equipment and how to prove the correct operation
WTS S4. Assess the performance and progress of a water treatment cleaning/disinfection operation by sample analysis and make adjustments to the programme as required	**Water system cleaning operations** include: pre-commission, flushing, chemical cleaning, disinfection, sterilisation, degreasing Apprentices should be able to: • explain the company procedures relevant to assessing the performance of water systems programme • describe the required sample analysis for chemical parameters, legionella bacteria, other micro-organisms, physical conditions • describe the control parameters for the treatment programme • describe the performance criteria relevant to the parameters involved • explain how to compare data and criteria • describe how to record the outcome of the comparison

Water Treatment Operations Supervisor Role Specific Knowledge and Skills	Amplification and Guidance
WTS S6. Produce a method statement and control scheme to manage the health, safety and environment during the various phases of a project.	In their portfolio apprentices should evidence examples where they have completed a work task risk assessment in accordance with company procedures Apprentices should be able to: • explain what to do if there is a problem with portable appliances • describe the principles of safe manual and mechanical handling and safe access • describe the safe access equipment to be used and explain how and when to use it • explain when and how to ensure that equipment is in safe working order • explain how to obtain and select appropriate Personal Protective Equipment (PPE) • describe the actions to take if there are health, safety and environmental problems within the workplace

Water Treatment Operations Supervisor Role Specific Knowledge and Skills	Amplification and Guidance
	• describe how they and others should respond in an emergency situation e.g. chemical spillage, unplanned discharge, toxic gas release, Health and Safety issues • describe relevant first aid procedures • describe how accidents, incidents and hazards should be reported in accordance with company procedures

Professional Discussion Roles and Responsibilities

Role	Responsibility
Independent Assessor	Record and report assessment outcome decisions for each apprentice, following instructions and using assessment recording documentation provided by Energy & Environment Awards.
Employer/Training Provider	The professional discussion must be scheduled with Energy & Environment Awards for a date and time which allow the apprentice to be well prepared. Ensure the apprentice has access to their portfolio before and on the day of the professional discussion.
Energy & Environment Awards	Arrange for the professional discussion to take place, in consultation with the employer/training provider and independent assessor.

Section 3: Grading and Grading Criteria

Component 1: Knowledge Test

The following grade boundaries apply to the knowledge test:

Grade	Minimum mark	Maximum mark
Fail	0	17
Pass*	18	24
Distinction*	25	30

*Apprentices will also need to **answer at least one question correctly within each group of questions mapped to each of the core knowledge statements**. A Fail is awarded if the apprentice has not achieved at least one mark against each of the core knowledge statements.

Component 2: Observation

The apprentice must demonstrate core KSBs and pathway specific skills for either Water Treatment Technician, Water Treatment Equipment Technician, Legionella Risk Assessor or Water Treatment Operations Supervisor in an integrated way for their pathway.

A Fail will be awarded if an apprentice has not achieved **all** the Pass criteria outlined in the Pass criteria

To gain a Pass, an apprentice must successfully achieve **all** the criteria/criteria for each KSB, according to the selected job role.

Observation: All roles	To achieve a Pass the apprentice must achieve **ALL** of the following:
Health and Safety S1, S2, S3, S6 B2, B4	Follow the organisational safety requirements for themselves and others, maintaining a safe working environment and completing the task in a safe, competent way. Complete a work task risk assessment and produces a work plan/method statement for the task(s) involved. Demonstrate how they report a risk or concern in the workplace to the correct individual in the organisation.
Communication skills S15 B1	Communicate effectively with the customer/site personnel and other organisational staff involved with the task.

Observation: All roles	To achieve a Pass the apprentice must achieve **ALL** of the following:
	Provide clear and accurate recommendations to customer/site personnel e.g. • WTT and WTE by discussion of the service report produced • LRA through discussion of the risk assessment report • WTS by discussion of the job completion report Act professionally demonstrating dependability, determination, honesty and integrity. Respect others, act ethically and contribute to sustainable development e.g. by behaving responsibly on site, reducing any impact of the task on the local environment and people, minimising waste produced and using the correct routes for waste disposal.
Complete Operational Tasks S7, S8, S11	Demonstrate how they check the requirement and correct operation of resources/equipment required for the task e.g. • WTT test equipment is calibrated and reagents are in date • WTE has the correct equipment manual and spare parts for the task • LRA knows if step ladders are required for access and has access to them if required • WTS flushing pumps are in serviceable condition

Observation: All roles	To achieve a Pass the apprentice must achieve **ALL** of the following:
	Identify suitable test or application points within the system e.g. • WTT identifies sample point for closed water system • WTE identifies suitable access point for a softener installation • LRA identifies suitable point in system to take a microbiological sample • WTS identifies access point for external flushing pump connection Correctly apply the treatment programme for the system involved e.g. • WTT identifies the most suitable bleed point for a cooling system • WTE installs the most suitable dosing pump for a chemical application • LRA can identify the suitable temperature monitoring points within a system • WTS supervises a closed system chemical flushing operation
Performance Testing S12	Correctly interpret the test results and assess the implications of the results for the treatment programme e.g. • WTT identifies the most suitable recommendations for a low treatment level in a closed system • WTE identifies the most suitable recommendations for hardness slippage through a softener

Observation: All roles	To achieve a Pass the apprentice must achieve **ALL** of the following:
	• LRA identifies the most suitable recommendations for low hot water temperature • WTS identifies the most suitable recommendations for chlorine levels during a system disinfection

Observation: Water Treatment Technician Role Specific Skills	
Communication skills WTT S3 WTT S5	Demonstrate the presentation or demonstration of treatment recommendations or programme controls to a customer. Demonstrate how they organise and carry out a review meeting with a customer and that they have imparted the correct information to the relevant people e.g. identify the relevant attendees and produce an agenda for the meeting

Observation: Water Treatment Equipment Technician Role Specific Skills	
Complete Operational Tasks WTE S3	Successfully complete the servicing of a piece of water treatment equipment in accordance with company procedures and relevant equipment specifications
Performance Testing WTE S3b, WTE S4	Service a piece of water treatment equipment e.g. dosing pump in accordance with company procedures and relevant equipment specifications and test for correct operation

Observation: Legionella Risk Assessor Role Specific Skills	
Communication skills LRA S5, LRA S6	Demonstrate how they prepare and present report findings to the customer personnel and how they discuss with the customer how recommended remedial actions and changes to management controls identified in the risk assessment can be implemented
Performance Testing LRA S1	Carry out water storage tank investigation/survey in accordance with company procedures

Observation: Water Treatment Operations Supervisor Role Specific Skills	
Complete Operational Tasks WTS S1, WTS S3b, WTS S5	Produce suitable diagrams to direct and manage the task involved e.g. system diagram identifying sample points Service temporary equipment required for the task in accordance with company procedures and relevant equipment specifications e.g. service an external flushing pump. Correctly supervise a team of water treatment operative

Component 3: Professional Discussion Supported by a Portfolio

The apprentice must demonstrate core KSBs and pathway specific skills for either Water Treatment Technician, Water Treatment Equipment Technician, Legionella Risk Assessor or Water Treatment Operations Supervisor in an integrated way for their pathway.

A Fail will be awarded if an apprentice has not achieved **all** the Pass criteria outlined in the Pass criteria

To gain a Pass, an apprentice must successfully achieve **all** the criteria for each KSB, according to the selected job role.

To achieve a Distinction, an apprentice must successfully achieve **all** the Pass assessment criteria and **4 out of 6** of the distinction criteria.

Water system surveys, water system requirements and treatment programme design	To achieve a Pass the apprentice must achieve ALL of the criteria based on their specific role option
Water Treatment Technician Role Specific WTT K1 WTT S1	Describe the information to be obtained during a water system survey to enable a water treatment programme to be designed e.g. water make up type, water usage, system operation Demonstrate how they have correctly applied an understanding of the water treatment requirements for a specific water system. e.g. by explaining programme design calculations and conclusions

Water system surveys, water system requirements and treatment programme design	To achieve a Pass the apprentice must achieve ALL of the criteria based on their specific role option
	Demonstrate how they use the information gathered to design a water treatment programme to meet the requirements, specification or guidance provided, e.g. by explaining the programme design calculations and conclusions
Water Treatment Equipment Technician Role Specific WTE K1, WTE K3a WTE S1 WTE S3a	Describe the information to be obtained during a water system survey to enable a water equipment installation to be designed e.g. water make up type, water usage, quality requirements Demonstrate how they have correctly applied an understanding of the water treatment requirements for a specific water system e.g. by explaining programme design calculations and conclusions Demonstrate how they use the information gathered to design a water treatment installation. e.g. by explaining programme design calculations and conclusions

Water system surveys, water system requirements and treatment programme design	To achieve a Pass the apprentice must achieve ALL of the criteria based on their specific role option
	Demonstrate the knowledge required to install specific water treatment equipment e.g. electrical requirements for a softener installation, or the service parts required Describe how they have installed and commissioned items of equipment
Legionella Risk Assessor Role Specific LRA K4 LRA S2	Describe the major elements of a water system and their design e.g. storage tanks, calorifiers, thermostatic mixer valves in a hot water system Describe how they prepare water system diagrams. e.g. schematic drawings produced by computer aided design software
Water Treatment Operations Supervisor Specific Role WTS K1 WTS S2	Describe the information to be obtained during a water system survey to enable a water system cleaning programme to be planned e.g. system access points, drainage, power supply Demonstrate how they have correctly applied an understanding of the water treatment requirements for a specific water system. e.g. from the system condition report, operative reports, analytical reports

Evaluate the water treatment programme options for an application	To achieve a Pass the apprentice must achieve ALL of the criteria based on their specific role option
Water Treatment Technician Role Specific WTT K2 WTT S2a, WTT S2b	Describe the chemical treatment options available for a specific water treatment application e.g. nitrite versus molybdate as a corrosion inhibitor Describe the physical treatment options available for a specific water treatment application e.g. hard water versus softened water make up for a cooling system Demonstrate how they have assessed the suitability of the chemical water treatment options in order to solve a technical problem they have encountered e.g. by explanation of the programme design calculations and conclusions Demonstrate how they have assessed the suitability of the physical water treatment options in order to solve a technical problem they have encountered e.g. by explanation of the programme design calculations and conclusions
Water Treatment Equipment Technician Role Specific WTE K2 WTE S2	Describe the treatment options available for a specific water treatment application and Demonstrate how they have assessed the suitability of the treatment options e.g. by explanation of the programme design calculations and conclusions

Evaluate the water treatment programme options for an application	To achieve a Pass the apprentice must achieve ALL of the criteria based on their specific role option
Legionella Risk Assessor Role Specific LRA K3, LRA K5 LRA S4	Demonstrate the understanding of the application of a water treatment programme e.g. chlorine dioxide dosing to a cold water supply system Demonstrate the identification of remedial, improvement and management actions. e.g. by explanation of the recommendations given in a risk assessment
Water Treatment Operations Supervisor Specific Role WTS K2a, WTS K2b	Describe the treatment options available for a specific water treatment cleaning application e.g. removal of suspended solids from a closed system Describe the treatment options available for a specific water system disinfection application e.g. sodium hypochlorite versus hydrogen peroxide for mains disinfection

Water treatment programme operational performance and assessment	To achieve a Pass the apprentice must achieve ALL of the criteria based on their specific role option
Water Treatment Technician Role Specific S9, S10, S13 WTT K3a, WTT K3b WTT S4	Describe the correct performance criteria for the programme type, the tests to be completed and the correct equipment to be used when performing this task e.g. calcium balance to monitor scale inhibition

Water treatment programme operational performance and assessment	To achieve a Pass the apprentice must achieve ALL of the criteria based on their specific role option
	Demonstrate the evaluation and implementation process that has been completed and explain the conclusions/recommendations arrived at. e.g. by explanation of the customer service report
Water Treatment Equipment Technician Role Specific S9, S10, S13 WTE K3b, WTE K3c	Describe the correct performance criteria for the equipment type, the tests to be completed and the correct equipment to be used when performing this task e.g. recovery rate at specific conductivities for Reverse Osmosis plant Demonstrate the evaluation and implementation process that has been completed and explain the conclusions/recommendations arrived at. e.g. by explanation of the equipment service report Describe the servicing requirements for a specific item of water treatment equipment e.g. membrane cleaning of a Reverse Osmosis plant Describe the maintenance requirements for a specific item of water treatment equipment e.g. routine calibration of a pH monitoring system

Water treatment programme operational performance and assessment	To achieve a Pass the apprentice must achieve ALL of the criteria based on their specific role option
Legionella Risk Assessor Role Specific S9, S10, S13 LRA K2 LRA S3	Describe the correct performance criteria for the system type, the tests that may be completed to assess this and the correct equipment to be used when performing this task e.g. legionella testing of a hot water system Describe the risk assessment principles that they use e.g. risk values weighted by local population of site e.g. by explanation of the risk assessment report findings and recommendations Demonstrate the evaluation and implementation process that has been completed and explain the conclusions/recommendations arrived at. e.g. by explanation of the risk assessment report
Water Treatment Operations Supervisor Specific Role S9, S10, S13 WTS K3 WTS S3a, WTS S4	Describe the correct performance criteria for the operation type, the tests to be completed and the correct equipment to be used when performing this task e.g. iron levels during a dynamic flushing operation Describe how they have installed and commissioned operational equipment.

Water treatment programme operational performance and assessment	To achieve a Pass the apprentice must achieve ALL of the criteria based on their specific role option
	Demonstrate the evaluation and implementation process that has been completed and explain the conclusions arrived at e.g. by explanation of the job completion report

Health, Safety and the Environment	To achieve a Pass the apprentice must achieve ALL of the following:
All roles S4	Comply with company practices, processes and procedures associated with safety. Demonstrate where they have contributed to the development of an operational solution to a health and safety issue. Identify the main Health and Safety and compliance requirements of a Water Treatment Technician e.g. Health and Safety at Work Act, L8, BS 2486, BS 8552 etc
Water Treatment Equipment Technician Role Specific WTE S5	Apply a safety first approach for themselves and colleagues keeping themselves and others safe.

Health, Safety and the Environment	To achieve a Pass the apprentice must achieve ALL of the following:
	Undertake and document workplace risk assessments and hazard reviews in accordance with company procedures. Describe how to supervise the health and safety of a team e.g. ensure all members of the team have the appropriate PPE for the task to be performed.
Legionella Risk Assessor Role Specific LRA K1	Identify the main Health and Safety and compliance requirements relevant to the production of a legionella risk assessment.
Water Treatment Operations Supervisor Specific Role WTS K4, WTS S6	Apply a safety first approach for themselves and colleagues keeping themselves and others safe. Undertake and document workplace risk assessments and hazard reviews in accordance with company procedures.

Workplace attitude	To achieve a Pass the apprentice must achieve ALL of the following:
All roles S16 B3, B5, B6, B7	Describe when they have operated as an effective team member and taken responsibility, e.g. when they have made independent decisions and suggested workplace improvements.

Workplace attitude	To achieve a Pass the apprentice must achieve ALL of the following:
	Describe the company's policy on ethics, equality and diversity, explaining why this is important, and illustrate this with an example of how they have effectively maintained a good relationship with either a colleague, client, supplier or member of the public. Demonstrate they have been receptive to feedback, willing to learn new skills and adapted to change. Demonstrate how they have assessed personal training needs in order to maintain a satisfactory level of competence in their job role e.g. when they have requested external OEM training or specific H S training e.g. confined spaces

Resource Management	To achieve a Pass the apprentice must achieve ALL of the following:
All roles S5, S14	Explain how their work process, use of resources and management of time is effective. e.g. • WTT explain their sample collection and drop off scheduling • WTE describe their equipment parts procurement procedure and work planning

Resource Management	To achieve a Pass the apprentice must achieve ALL of the following:
	• LRA describes the necessary site communication channels for access arrangements • WTS explains the team selection criteria used and the reasons for the organisation of labour on site for the operation

Distinction grading criteria for the professional discussion

Water system surveys, water system requirements and treatment programme design	To achieve a Distinction the apprentice must achieve ALL Pass criteria and FOUR out of SIX of the Distinction criteria
Water Treatment Technician Role Specific WTT K1 WTT S1	Explain the risks and implications of failure to follow the correct design principles and the likely problems that will occur. e.g. corrosion/scale reducing plant efficiency and lifespan Describe the maintenance and monitoring programme that can be employed to ensure the continued suitability of the treatment programme. e.g. corrosion monitoring of high risk metals within the system

Water system surveys, water system requirements and treatment programme design	To achieve a Distinction the apprentice must achieve ALL Pass criteria and FOUR out of SIX of the Distinction criteria
Water Treatment Equipment Technician Role Specific WTE K1, WTE K3a WTE S1 WTE S3a	Explain the risks and implications of failure to follow the correct design principles and the likely problems that will occur e.g. poor water quality causing deterioration of final product Describe the maintenance and monitoring programme that can be employed to ensure the continued suitability of the treatment programme. e.g. regenerant usage profile and cost reduction
Legionella Risk Assessor Role Specific LRA K4 LRA S2	Explain the risks and implications of failure to follow the correct design principles and the likely problems that will occur. e.g. implications of health scare to customers business Describe the monitoring programme that can be employed to ensure the continued suitability of the risk assessment. e.g. the effectiveness of remedial engineering actions taken

Water system surveys, water system requirements and treatment programme design	To achieve a Distinction the apprentice must achieve ALL Pass criteria and FOUR out of SIX of the Distinction criteria
Water Treatment Operations Supervisor Specific Role WTS K1 WTS S2	Explain the implications of selecting an unsuitable treatment option and how this could be rectified e.g. non-dynamic flushing of a multiple floor heating system Explain the benefits for the customer of completing the cleaning procedure e.g. improvement in heat transfer processes derived from a cleaning procedure

Evaluate the water treatment programme options for an application	To achieve a Distinction the apprentice must achieve ALL Pass criteria and FOUR out of SIX of the Distinction criteria
Water Treatment Technician Role Specific WTT K2 WTT S2a, WTT S2b	Demonstrate how they have evaluated the benefits and drawbacks of different treatment programme options and Demonstrate an understanding of the commercial cost implications of treatment options. e.g. through explanation of the comparison of cost benefits of the options in a quotation

Evaluate the water treatment programme options for an application	To achieve a Distinction the apprentice must achieve ALL Pass criteria and FOUR out of SIX of the Distinction criteria
	Explain the implications of selecting an unsuitable treatment option and how this could be rectified. e.g. incorrect biocide for a closed water system
Water Treatment Equipment Technician Role Specific WTE K2 WTE S2	Demonstrate how they have evaluated the benefits and drawbacks of different equipment options and Demonstrate an understanding of the commercial cost implications of treatment options e.g. through explanation of the comparison of cost benefits of the options in a quotation Explain the implications of selecting an unsuitable treatment option and how this could be rectified. e.g. softened water for a sodium sensitive chemical blending plant
Legionella Risk Assessor Role Specific LRA K3, LRA K5 LRA S4	Explain the implications of selecting an unsuitable treatment option and how this could be rectified. e.g. continuous dosing of a silver stabilised peroxide to a potable water system.

Evaluate the water treatment programme options for an application	To achieve a Distinction the apprentice must achieve ALL Pass criteria and FOUR out of SIX of the Distinction criteria
	Demonstrate an understanding of the cost implications of recommended remedial actions e.g. comparative cost of tank refurbishment versus replacement
Water Treatment Operations Supervisor Role Specific WTS K2a, WTS K2b	Explain the risks and implications of failure to follow the correct cleaning programme and the likely problems that will occur. e.g. incorrect cleaning programme closing down production process and consequent losses to both the customer and the employer Explain the risks and implications of failure to follow the correct disinfection programme and the likely problems that will occur. e.g. incorrect cleaning programme closing down production process and consequent losses to both the customer and the employer

Water treatment programme operational performance and assessment	To achieve a Distinction the apprentice must achieve ALL Pass criteria and FOUR out of SIX of the Distinction criteria
Water Treatment Technician Role Specific S9, S10, S13 WTT K3a, WTT K3b WTT S4	Explain the risks and implications of poor treatment programme performance. e.g. corrosion/scale reducing plant efficiency and lifespan Demonstrate an understanding of the potential improvements that could be made to the programme and evaluate the benefits of those improvements e.g. changing from non-oxidising biocide programme to oxidising biocide
Water Treatment Equipment Technician Role Specific S9, S10, S13 WTE K3b, WTE K3c	Explain the risks and implications of poor treatment equipment performance. e.g. poor water quality causing deterioration of customer's final product Demonstrate an understanding of the potential improvements that could be made to the programme and evaluate the benefits of those improvements e.g. mixed bed polishing unit after Reverse Osmosis for ultrapure water supply
Legionella Risk Assessor Role Specific S9, S10, S13 LRA K2 LRA S3	Explain the risks and implications of poor treatment programme performance. e.g. the commercial implications of health scare to the customer's business Demonstrate an understanding of the potential improvements that could be made to the programme and evaluate the benefits of those improvements e.g. continuous biocide dosing to hot and cold water systems where legionella are prevalent

Water treatment programme operational performance and assessment	To achieve a Distinction the apprentice must achieve ALL Pass criteria and FOUR out of SIX of the Distinction criteria
Water Treatment Operations Supervisor **Role Specific** S9, S10, S13 WTS K3 WTS S3a, WTS S4	Explain the risks and implications of poor cleaning operation performance. e.g. incorrect cleaning programme closing down production process and consequent losses. Demonstrate an understanding of the potential improvements that could be made to the water treatment programme on a cleaned system e.g. side stream filtration to remove suspended solids

Health, Safety and the Environment	To achieve a Distinction the apprentice must achieve ALL Pass criteria and FOUR out of SIX of the Distinction criteria
All roles S4	Demonstrate an understanding of where to improve Health and Safety within their workplace, including actions taken e.g. where reduced hazards minimised the risk to health or improved the system integrity
Water Treatment Equipment Technician **Role Specific** WTE S5	Challenge unsafe practice outside of their immediate control or responsibility and is proactive in resolving those practices e.g. transport of equipment from point of delivery to the site of installation

Health, Safety and the Environment	To achieve a Distinction the apprentice must achieve ALL Pass criteria and FOUR out of SIX of the Distinction criteria
Legionella Risk Assessor Role Specific LRA K1	Challenge unsafe practice outside of their immediate control or responsibility and is proactive in resolving those practices e.g. identifies health risks associated with a water system not directly linked to the legionella risk assessment process and brings this to the attention of the client.
Water Treatment Operations Supervisor Role Specific WTS K4, WTS S6	Challenge unsafe practice outside of their immediate control or responsibility and is proactive in resolving those practices e.g., produces a risk based chemical handling and transport procedure for delivery of chemicals to site

Workplace attitude	To achieve a Distinction the apprentice must achieve ALL Pass criteria and FOUR out of SIX of the Distinction criteria
All roles S16 B3, B5, B6, B7	Demonstrate a clear development plan, outlining choices and opportunities available beyond the completion of the apprenticeship. e.g. personal review/assessment of their career progression potential with current employer and within the industry as a whole and what is required to achieve those goals

Resource Management	To achieve a Distinction the apprentice must achieve ALL Pass criteria and FOUR out of SIX of the Distinction criteria
All roles S5, S14	Show an understanding of the importance of effective time and resource management and the implications to themselves and their employer. e.g. cost to the employer of aborted site visits, missing materials and call backs

Overall grading

The apprenticeship will be graded fail, pass or distinction. The final grade will be determined by collective performance in the three assessment components.

In order to gain a pass, an apprentice must achieve a minimum of a pass in each EPA component. A pass represents full competence against the standard. To achieve a distinction grade, an apprentice must achieve a distinction in each EPA component.

The knowledge test, observation and professional discussion are all marked separately and awarded a fail, pass or distinction.

The knowledge test is based on the mark achieved. the grade and mark for the observation and professional discussion is based on the number and level of criteria achieved.

The overall grade for the WTT Standard is based on the grades in individual components as follows:

Knowledge Test	Observation	Professional Discussion	EPA Grade
Failure of any component results in an overall fail			Fail
Pass	Pass	Pass or Distinction	Pass
Pass or Distinction	Pass	Pass	Pass
Distinction	Pass	Distinction	Distinction

The scoring criteria that will be applied for each assessment criteria along with additional details can be found in Section 3 of this Specification.

Section 4: Resits and retakes

Apprentices who fail one or more EPA components can re-sit or re-take the failed component at the employer's discretion. The apprentice's employer needs to agree that a re-sit or re-take is appropriate. A re-sit does not need further learning, but a re-take does. Apprentices should have a supportive action plan to prepare for a re-sit or a re-take.

The employer and Energy & Environment Awards agree the timescale for a re-sit or re-take. Failed EPA components must be re-sat or re-taken within the 3 month end-point assessment period, otherwise the EPA will need to be re-sat or re-taken in full.

Re-sits and re-takes are not offered to apprentices wishing to move from pass to a higher grade.

An apprentice will get a maximum component grade of pass for a re-sit or re-take.

Energy & Environment Awards resit and re-take policy can be found at: https://energyenvironmentawards.co.uk/policies-and-fees/

Section 5: Practical Guidance

Observation Brief

Purpose

Energy & Environment Awards provide a framework brief for each of the pathways. Appendix E, WTT Supporting Documents 'Observation Framework Briefs.' Detail of the proposed activity will be added by the employer/provider to reflect a live work activity. The final brief together with the Observation Planning Form will be submitted to Energy & Environment Awards for checking in advance of the actual observation.

The purpose of the brief is to provide

- information about the requirements of the observation to help ensure the proposed practical task(s) are fit for purpose
- support in ensuring that the practical task(s), test facilities, necessary equipment, tools and examination conditions are in place to allow the practical task(s) in the observation to take place
- information about the grading applied to the observation

The relevant brief should be referred to when planning suitable practical task(s) to be covered for the observation.

Observation Planning Form and Review Service

Energy & Environment Awards provide an observation review service to assist with planning for all employers/training providers with apprentices on this standard. To access the service, refer to Appendix F, WTT Supporting Documents 'Observation Planning Form.'

Purpose

The purpose of the planning service is to provide support in ensuring that the practical task(s), test facilities, necessary equipment, tools and controlled conditions are in place to allow the practical task(s) to take place. The review helps ensure the proposed practical task is sufficiently complex to allow the apprentice to demonstrate the required knowledge, skills and behaviours.

Details of the relevant elements, where the observation should be conducted, equipment and tools are included in Section 2 of the Specification. Tasks should be designed to allow variation to be introduced, reducing predictability.

The employer/training provider must ensure:

- the task being observed is suitable and sufficient and is to be carried out at a suitable premises. Site access for the assessor and any specific requirements must be advised in advance.
- all equipment and resources are suitable for the task, in good safe working condition and certification where applicable

The employer/training provider must ensure that the practical task(s) is developed to allow the independent assessor to observe the apprentice synoptically demonstrate core and specific KSBs.

Submitting the form to Energy & Environment Awards

The employer/training provider should complete and submit the 'Level 3 WTT Observation Planning Form' to Energy & Environment Awards Service Delivery Team for approval 1 month before the observation. The form should be accompanied by photographs and/or video(s) of the plant, machinery, equipment areas, including practical tasks/briefs which the apprentice will be working on.

Energy & Environment Awards Review Process

Once the approval form has been received the review process will be conducted by Energy & Environment Awards. The outcomes will be shared with the employer/training provider no later than 5 working days following the review.

Please be aware:

- Practical task/briefs review does not guarantee that the apprentice will pass the practical task
- No health and safety risk assessment has been carried out by Energy & Environment Awards

- Energy & Environment Awards review does not remove any of the training provider obligations to ensure full coverage of the standard, and full compliance with relevant legislation
- Energy & Environment Awards review is based only on information supplied and is not a guarantee that the practical tasks/briefs, selected plant/machinery/equipment on the day of the practical will be sufficient for an EPA practical task
- The information provided in this Level 3 WTT Observation Planning Form must not be shared with the apprentice

Preparing for the Observation

Where possible, the employer/training provider should provide the apprentice with the opportunity to carry out a practice observation as close to the real assessment described in Section 2 of the specification (Component 2).

The employer/training provider should prepare a practical task similar to (but not identical to) the tasks being used for the live assessment. A suitable person should be chosen to play the part of the assessor.

A template is provided to help ensure that the activities assessed during the observation will give complete coverage of the standard. See Appendix G, WTT Supporting Documents 'Practice Observation Templates.'

Preparing for the Professional Discussion

A practice professional discussion should take place between the apprentice and the person acting the role of an assessor. The apprentice should draw on evidence from their portfolio during the discussion.

Guidance on Portfolio of Evidence

The portfolio is not assessed. It serves the following purpose:

- Provides the opportunity to demonstrate the core and specific KSBs required across the standard
- The assessor reviews the portfolio before the professional discussion to help focus and contextualise their questions

- A carefully prepared mapped portfolio supports the apprentice during the professional discussion

Quality vs Quantity

The apprentice should be supported in selecting and mapping evidence for their portfolio in the mapping document. They must gather evidence on the full range of KSBs required by the standard and be assessed on particular tasks or procedures or items of equipment during their observation.

The portfolio must be sufficient to evidence the apprentice can apply the KSBs required in a variety of tasks.

In theory one comprehensive job-write up could cover all the required KSBs. In practice, this is more likely to be in several job write-ups plus a few smaller pieces of evidence targeting specific elements of the standard.

Choose the best pieces of evidence that have been mapped for each KSB covered by the professional discussion supported by a portfolio. An independent assessor will look for one suitable piece of evidence for each KSB. To be confident of meeting the standard, apprentices should aim to have two pieces of evidence mapped to each KSB. Progress review documents should also be included.

What to include in the Portfolio?

The portfolio:

- must contain a mapping document where evidence is mapped against the KSBs. A template has been produced to help the apprentices with collecting and mapping their evidence. A copy of the template is included. See Appendix G, WTT Supporting Documents 'Portfolio Mapping Document.'
- evidence must relate to 'real' work completed by the apprentice. Evidence from simulated activities is not allowed
- evidence must contain **at least one piece of quality evidence relating to each KSB**. This piece of quality evidence must demonstrate the KSBs as outlined in Section 2 of this Specification which will be assessed by the professional discussion supported by a portfolio

- must include evidence that **covers all KSBs** required, and this would normally come from evidence relating to more than **one holistic job**
- will include **written accounts of activities** that have been completed and referenced against the knowledge, skills and behaviours supported by appropriate photographic evidence and work products, for example work instructions, safety documentation, company policies and procedures as appropriate to the activities
- may include **progress review documentation** - reviews which should be completed and recorded to determine progression towards competence across the entire occupational Standard
- will contain a maximum of 30 pieces of quality evidence. In this instance a piece of evidence is defined as a combination of individual items which together provide evidence for a grade descriptor
- will be available, during the professional discussion, allowing the apprentice to refer to it
- must contain demonstrations of work carried out over a period of time and must include evidence of work carried out within the last three months of the on programme period
- must contain a minimum of 2 and no more than 3 activities carried out by the apprentice that demonstrates the higher order knowledge, skills and behaviours.

Examples of acceptable evidence include:

- work output e.g. surveys, reports, quotations
- workplace documentation/records, for example log data, workplace risk assessments, job task sheets/job card/times sheets, equipment maintenance /service records related to the apprentice
- employer feedback/reviews
- witness statements signed and dated by coaches/trainers
- recorded questions/answers/ workbooks
- performance records
- target achievement records
- video clips (maximum total duration 10-minutes); the apprentice must be in a view and identifiable
- taped audio evidence

- quality achievement records
- maintenance records
- annotated photographs/diagrams
- situations that have been difficult and challenging, and how these have been overcome e.g. equipment breakdown which has results in a change in working practice while still adhering to company procedures

Any employer contributions must focus on direct observation of evidence (e.g. review/witness statements) of competence rather than opinions.

The above is not a definitive list. The apprentice can include other relevant evidence sources. The portfolio must not contain any methods of self-assessment.

Evidence must be:

- produced by the apprentice (authentic)
- relevant to the standard (K, S or B) that it is mapped to
- produced during the time the apprentice is carrying out their on-programme training

What can the apprentice do?

The apprentice should:

- be familiar with the structure of their portfolio
- know the KSBs covered by the professional discussion
- know the grading criteria
- ensure there is evidence to cover every KSB in the professional discussion
- practise mapping evidence and completing the evidence mapping grid

The role of the employer/training provider

Employer/training providers are expected to support the apprentice in preparing their portfolio by:

- clarifying responsibility for supporting the apprentice to select and map evidence for the portfolio, including employer coaches/mentors where applicable

- advising on which pieces of evidence to select to ensure that when looked at as a whole, they provide coverage of all the required elements of the standard assessed in the professional discussion
- supporting the mapping of evidence and production of a mapping document
- authenticating evidence as valid
- signing off the portfolio
- submitting the portfolio to Energy & Environment Awards as part of Gateway

What to expect in the practice professional discussion?

The practice professional discussion will be supported by a portfolio which will provide the apprentice with the opportunity to practice discussing their KSBs gained throughout their on-programme and by referring to the evidence from their portfolio using the portfolio mapping document. A suitable person should be chosen to play the part of the assessor.

A practice professional discussion template is provided for use to prepare the appropriate questions to ask and to record the apprentices' performance. See Appendix H, WTT Supporting Documents 'Practice Professional Discussion Templates.'
As part of the practice exercise, apprentices should have access to their portfolio to support their responses.

Preparing for the Knowledge test

While on-programme, the employer and/or training provider should brief the apprentice on the areas to be assessed by the knowledge test, as detailed in Section 2 in this specification. It is good practice to identify the areas within the learning programme where the relevant knowledge is delivered, ensuring that apprentices are aware that elements of these might come up in the test.

The knowledge test is aligned to the standard rather than a specific job role that the apprentice may be doing. The questions have been written to reflect the Water treatment technician role as a whole and not focussed on specific plant, machinery, or employer-specific processes.

In readiness for end-point assessment, the apprentice should complete a practice knowledge test. This should be undertaken in advance of the live knowledge test, with enough time to mark the test, and provide feedback to the apprentices. See Appendix C, WTT Supporting Documents 'Practice Multiple-choice Test.'

For maximum effect, ensure the test is taken in exam conditions similar to those that will be experienced in a live test.

Section 6: Authenticity and security of apprentice work

The apprentices must be advised by their training provider and employer that copying of any work (whether it is from another apprentice or from internal, external documents or source) and presenting it as their own will be deemed as malpractice and will lead to their work being disqualified. Apprentices must not share their work or allow any person to copy their work as this is not allowed and would also be deemed as malpractice.

In signing off the portfolio, training providers and employers must be satisfied that the evidence in the portfolio is:

- **adequate**: evidence must cover all relevant KSBs within the assessment plan. Adequate does not mean a large quantity of evidence. The evidence should focus on quality rather than quantity
- **authentic**: apprentices must be able to confirm and talk about the evidence that they submit with the independent assessor, appointed by Energy & Environment Awards. It is vitally important apprentices only submit evidence relating to them
- **appropriate**: all evidence must be relevant to the KSBs assessed during the professional discussion
- **recent and up to date**: all evidence must be linked to KSBs must be recent and current which demonstrate the apprentice's competence. The independent assessors, appointed by Energy & Environment Awards will assess current competencies, and the apprentice must map the evidence to demonstrate the relevant work to the KSB. Apprentices must gather the evidence during their on-programme training