ENERGY & ENVIRONMENT AWARDS

Skills for a greener world

EEA Level 3 End-point Assessment for Water Treatment Technician

Apprentice Guide

QAN 610/6028/8
ST0453 V1.0

Apprentice Guide for

EEA Level 3 End-point Assessment for Water Treatment Technician

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Updates to this Guide

Since the first publication of Energy & Environment Awards Water Treatment Technician Apprentice Guide, the following updates have been made.

Version	Date first published	Section updated	Page(s)
v2.0	2025	Rebranded	All
v1.1	June 2025	Formatting	All
v1.0	30 March 2024	First published	All

At A Glance Component 1: Knowledge Test

Date(s):	
Time:	
Location:	
Examination Conditions:	Controlled by an invigilator
Additional Requirements:	
Assessed and marked by:	Energy & Environment Awards

At A Glance Component 2: Observation

Date(s):	
Time:	
Location:	
Examination Conditions:	With an Energy & Environment Awards assessor in your place of work, under normal working conditions
Additional Requirements:	
Assessed and marked by:	Independent assessor/Energy & Environment Awards

At A Glance Component 3: Professional discussion supported by a portfolio

Date(s):	
Time:	
Location:	
Examination Conditions:	With an Energy & Environment Awards assessor in a quiet room, free from distractions
Additional Requirements:	
Assessed and marked by:	Independent assessor/Energy & Environment Awards

Introduction

Energy & Environment Awards has been selected by your employer to carry out end-point assessment (EPA) and it is our job to ensure that you are assessed fairly.

How This Apprentice Guide Is Organised

- ✓ Section 1:

  What is in the Apprentice Guide?

- ✓ Section 2:

  An Apprentice's End-point Assessment Journey

- ✓ Section 3:

  End-point Assessment Components

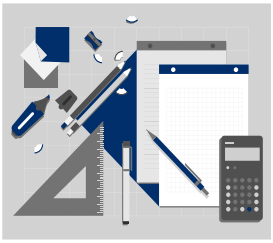
How to Use This Guide

This guide has been split into 3 sections. You can dip into each section that you are working on where you will find useful information, practical advice, tips you need and useful dates to successfully complete your EPA.

Throughout we have used headings and cross referenced to our EPA Water Treatment Technician (WTT) Specification and/or Supporting Documents which provides details of the EPA components.

Section 1: The Basics

What is an Apprenticeship Standard?



An apprenticeship standard is a description of your apprenticeship, and it is based on the water treatment technician standard, which was written by employers. It contains the water treatment technician's job profile, and describes the knowledge, skills and behaviours (KSBs):

- Knowledge: (as part of KSBs) – specific information, technical detail, and 'know-how' identified as part of the apprenticeship standard that must be evidenced during your end-point assessment
- Skills: (as part of KSBs) – the practical application of knowledge identified as part of the apprenticeship standard that must be evidenced during end-point assessment
- Behaviours (as part of KSBs) – specific mindsets, attitudes or approaches identified as part of the apprenticeship standard that must be evidenced during end-point assessment

The standard can be accessed via the link below:
https://skillsengland.education.gov.uk/apprenticeship-standards/st0453-v1-0

What is an Assessment Plan?

An Assessment Plan is also written by employers and provides details of what is required for you to pass your end-point assessment. It includes details of what you will be assessed on, how each assessment will take place, what methods will be used and who will assess you.

Energy & Environment Awards designed the end-point assessment (EPA) to meet the requirements of the Assessment Plan. The Assessment Plan can be accessed via the link below: https://skillsengland.education.gov.uk/media/2627/st0453_water-treatment-technician_l3_ap-for-publication_11022019.pdf

What is an end-point assessment (EPA)?

The end-point assessment is the assessments you take at the end of your apprenticeship. You will typically spend 24 -30 months on-programme working towards your standard with a minimum of 20% off-the-job training. You are required to spend a minimum of 12 months on-programme. After this you have a Gateway meeting with your employer or training provider to confirm you are ready for the end-point assessments. The words end-point means that you will be assessed at the end of your on-programme (training) to confirm you have met the standard. Your EPA period will typically last 3 months. The end-point assessments consist of 3 components:

- Knowledge test (Multiple-choice test)
- Observation
- Professional discussion supported by a portfolio

Each component has a provisional grade, and each grade is carried forward to award a final grade. You must pass all 3 components to pass your apprenticeship.

The final grade can be a Fail, Pass or Distinction.

What are the Gateway Requirements?

Gateway is a meeting where your employer, training provider and you ensure that you are confident that you can demonstrate all the KSBs defined in the apprenticeship standard and you are ready for EPA. After the meeting, your training provider will confirm the outcomes of the Gateway meeting by sending a signed document to Energy & Environment Awards. The document confirms that you have met the following Gateway requirements:

- achieved English and maths at level 2
- compiled a portfolio of evidence, which will support the professional discussion

Your training provider will send copies of these documents to Energy & Environment Awards.

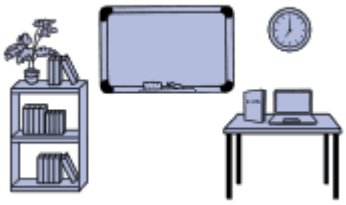
What is the EPA Specification?

The end-point assessment specification provides details of the assessment methods used in your EPA, which:

- KSBs that are covered by each assessment
- KSBs amplification and guidance

The Specification can be accessed via the link below:
https://energyenvironmentawards.co.uk/epa/water-treatment-technician/

Section 2: Apprentice EPA Journey



Let us Begin Your EPA Journey.

Find a quiet place and read on….

Water Treatment Technician is a core and options apprenticeship standard. You must be trained and assessed against the core and one of the following specialisms:

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

Your EPA journey consists of 3 elements:

- A training programme with on the job, off the job elements, typically 24 months
- Gateway meeting window
- End-point Assessment (EPA) typically 3 months

Your journey begins with the training program. Your employer and training provider are responsible for this part. This is where you will gain the required Knowledge, Skills and Behaviours (KSBs).

How will you be assessed in the end-point assessment?

You will be assessed on the following components, which can be taken in any order:

1. **Knowledge test (Multiple-choice test)**
2. **Observation**
3. **Professional discussion supported by a portfolio**

It is important for you to keep a record of when your 3 components are scheduled. We suggest you use the ‘At a Glance’ tables on page 5.

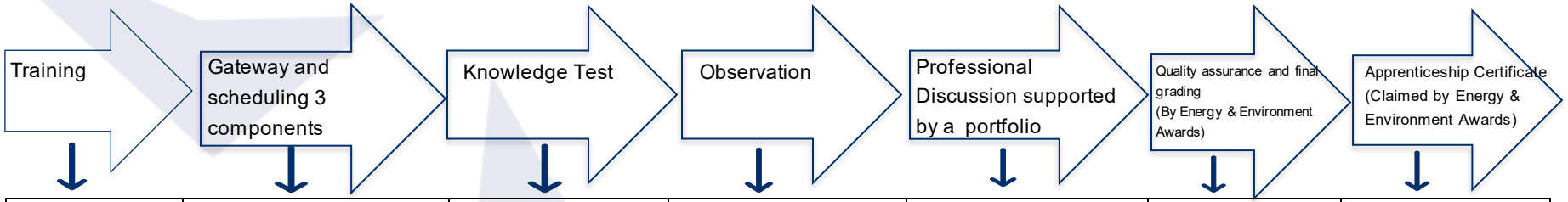
You must pass all 3 components to achieve this qualification. For further guidance refer to Section 3 End-point Assessment Components.

Reasonable adjustments

A reasonable adjustment is any action that helps to reduce the effect of a disability or difficulty that places you at a substantial disadvantage during assessments. If this applies to you make sure you tell your training provider who can make an application for a reasonable adjustment to Energy & Environment Awards on your behalf.

Your EPA Journey in a Diagram

The diagram below illustrates the order of your EPA **journey** from the day you register to your final certification:



Typically, 24 -30 months	You have: Attended a Gateway meeting with your employer/ provider. Achieved English and maths at level 2 Compiled a portfolio of evidence, which your professional discussion will be based on.	1 hour. Multiple-choice 30 questions. Under exam conditions supervised by an invigilator. Face to face. Closed book.	Assessment time is 2 hours within a single day. Under examination conditions. Directly observed by an Independent Assessor. For further Observation details see * below.	1 hour 30 minutes. Time may increase up to 10%, to allow you to complete your last answer. Under examination conditions. Face to face or remote as agreed. Recorded using relevant technology. Independent Assessor. For further details of Professional. Discussion see * below.	Awarded Final Grading: Distinction, Pass or Fail.	ESFA will send your Certificate to your training provider or employer. Contact your training provider or employer if you do not receive your certificate.

*For further details refer to Section 3 in this Apprentice Guide Or Section 2 of the Specification.

Section 3: End-point Assessment Components

Now let us continue your journey through EPA. There are 3 components that you must pass to be awarded a certificate.

Component 1: Knowledge Test

Overview

The knowledge test is paper based. You will have 60 minutes to complete the test. The test consists of 30 questions.

The multiple-choice questions will have four possible answers of which one will be correct.

Step-by-Step Guide

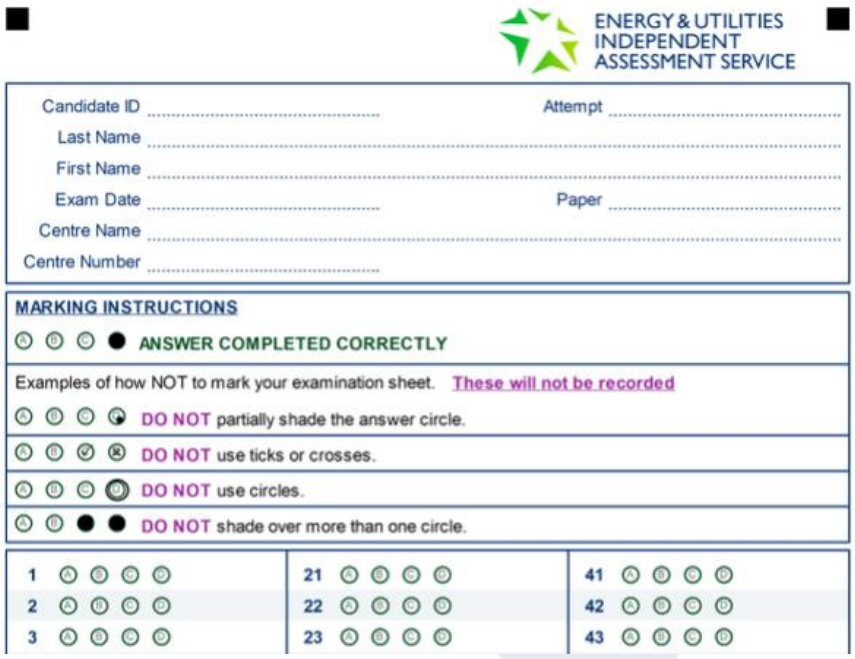
The table below provides a step-by-step guide on how the knowledge test will be carried out:

Who will start and finish my knowledge test?	You will sit your knowledge test in the presence of an invigilator.
What format will my test take?	The test may be paper-based or taken online. Your training provider will let you know what the format of your test is. All other aspects of the test are exactly the same, including: • content • timings • question types • scoring

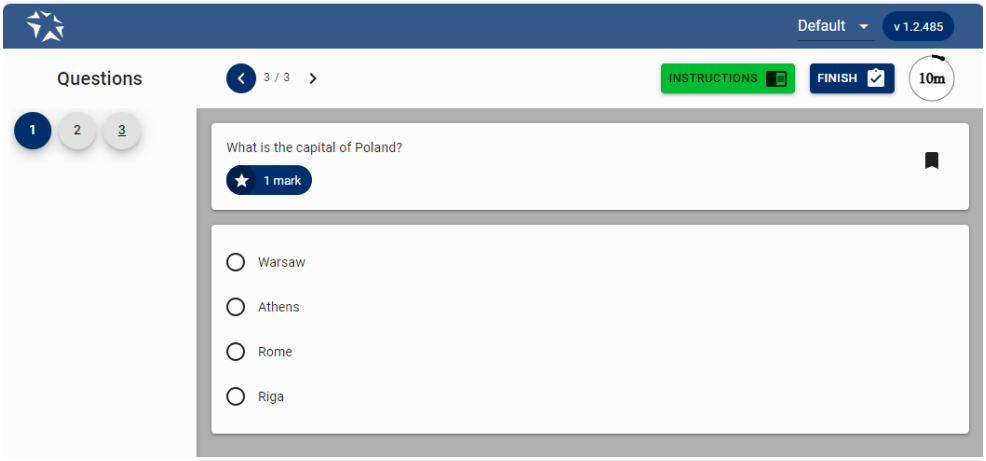
<table>
<tr>
<td>How will the question appear in a paper-based test?</td>
<td>
Here is an example of how the question will appear in a paper-based version of the test:

<table>
<tr><th colspan="2">Question 1</th></tr>
<tr><td colspan="2">In a workplace, who is responsible for maintaining health and safety?</td></tr>
<tr><th colspan="2">Possible answers</th></tr>
<tr><td>a)</td><td>Employers</td></tr>
<tr><td>b)</td><td>Safety managers</td></tr>
<tr><td>c)</td><td>Most senior person on-site</td></tr>
<tr><td>d)</td><td>Everyone</td></tr>
</table>

You must select one answer that you think is correct. You will be provided with an answer sheet where you will be expected to shade in the answer you have selected. Here is an example:


ENERGY & UTILITIES INDEPENDENT ASSESSMENT SERVICE
Candidate ID ..... Attempt .....
Last Name .....
First Name .....
Exam Date ..... Paper .....
Centre Name .....
Centre Number .....
MARKING INSTRUCTIONS
ANSWER COMPLETED CORRECTLY
Examples of how NOT to mark your examination sheet. These will not be recorded
DO NOT partially shade the answer circle.
DO NOT use ticks or crosses.
DO NOT use circles.
DO NOT shade over more than one circle.
1 2 3 ... 21 22 23 ... 41 42 43

Always have a go even if you are not sure that it is the correct answer.
</td>
</tr>
<tr>
<td>How will the question</td>
<td>Here is an example of how the question will appear in an online version of the test:</td>
</tr>
</table>

appear in an online test?	 You must **select one answer** that you think is correct. You should get an opportunity to do a sample test so that you are familiar with the screen and navigating the questions.
Can I take any resources into the exam room?	The test is closed which means that you cannot refer to reference books or any other materials. You will be provided with appropriate stationery on the day.
Can I have access to the internet?	No access to the internet is allowed and this means you must not take your SMART watch into the exam room.
How will the knowledge test be organised for me?	**Locations:** Your knowledge test will take place at your employer's or training provider's premises or a suitable venue. • You will take the test in a quiet space and in the presence of an invigilator • Your test will be scheduled by your employer or training provider with Energy & Environment Awards • If you fail the knowledge test, you can re-sit or re-take the failed test at your employer's discretion. There are no limits to the number of re-sits or re-takes you can take but it is important to revise and ensure that you are confident with the knowledge you are being tested on
What criteria will I	The knowledge test questions are knowledge based and sample the 7 core knowledge criteria. Below is a list of the knowledge criteria,

<table>
<tr>
<td>have to learn?

AND

How many questions will be asked on each criteria?</td>
<td>assessed in the knowledge test along with the range of questions that will be allocated to a knowledge test paper:

<table>
<tr><th>Number of Questions</th><th>Knowledge</th></tr>
<tr><td>4 - 5</td><td>K1. Chemical reactions involved in the corrosion and scaling processes in water systems</td></tr>
<tr><td>4 - 5</td><td>K2. Inhibition methods for the reduction of corrosion of different metals including steel, copper and aluminium in water systems</td></tr>
<tr><td>4 - 5</td><td>K3. Inhibition methods for the reduction of different scale types in specific water systems including cooling towers, steam boilers and manufacturing processes, etc.</td></tr>
<tr><td>4 - 5</td><td>K4. Cell structure of waterborne microbes and the interactions with biocidal products used to control them</td></tr>
<tr><td>4 - 5</td><td>K5. The concepts of flow and heat transfer in water systems and how they affect water treatment processes</td></tr>
<tr><td>4 - 5</td><td>K6. Ion transfer technologies, including resin and membrane-based systems, used to change water quality</td></tr>
<tr><td>4 - 5</td><td>K7. The use of specialised analytical equipment for the testing in field of water samples including digital titration, colorimeters and photometers</td></tr>
</table>

  Remember the questions have been written to reflect the water treatment technician role as a whole and are not focussed on specific plant, machinery, or employer-specific processes. For amplification and guidance refer to Section 3 of the WTT Specification.</td>
</tr>
<tr>
<td>How is the test graded?</td>
<td>You must demonstrate that you have an understanding of all core knowledge criteria, listed above. You will need to answer at least one question correctly within each group of questions mapped to each of the core knowledge criteria.

A Fail is awarded if you do not achieve at least one mark against</td>
</tr>
</table>

	each of the core knowledge criteria and/or achieve 17 or less correct answers. In addition to demonstrating that you have an understanding of all core knowledge statements: • the Pass mark is 18 correct answers • the Distinction mark is 25 correct answers
What should I do to prepare for the knowledge test?	**You should be prepared to**: • revise the knowledge criteria listed above (K1, K2, K3, K4, K5, K6, K7) • ask your employer or training provider for additional questions that they have prepared to support you • attend the knowledge test which will last 60 minutes While on-programme, the employer or training provider must ensure you are: • familiar with all areas assessed by the knowledge test as listed above • supported in completing a practice test and provide you with constructive feedback to enable you to identify areas you need to carry out further revision in

Practice Component 3: Multiple-Choice test

You should have an opportunity to have a practice knowledge test which mirrors the real assessment. The practice knowledge test would be set up using the structure in the table above by your employer or training provider. The feedback provided will assist you with preparing for the actual knowledge test.

Component 2: Observation

Overview

An observation involves an independent assessor, appointed by Energy & Environment Awards observing and questioning you undertaking a set task or a series of set tasks in your normal place of work in a suitable area where you can

work unhindered and without gaining advantage from others. The task(s) must be capable of being completed by a competent water treatment technician.

Step-by-Step Guide

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

Structure of your observation	The total assessment time is 2 hours for completing the set tasks. • Breaks may be taken during the observation to allow you to move from one location to another and for meal/comfort breaks • Where breaks occur, the clock will be paused. The assessment time is not reduced
Where will the assessment take place?	• Your normal place of work • Questioning will take place during or after the task completion and will be completed within the total time allowed for the observation
What knowledge, skills and behaviours (KSBs) do I have to demonstrate during the observation with questioning?	**Core Skills**: **S1**. Understand, comply with and implement statutory health and safety regulations with regard to the tasks being undertaken. **S2**. Understand and implement organisational safety requirements for themselves and others, including responsibility and supervision for safe access to water systems and the handling of chemicals. **S3**. Maintain a safe environment for other building occupants during water treatment operations including any relevant signage and notifications. **S6**. Complete work task risk assessments and develop work plans and method statements for the task(s) involved. **S7**. Ensure the suitability and correct operating condition of resources and equipment for the work tasks involved. This can include test equipment, chemical dosing equipment, water pumps and other specialised equipment.

	S8. Identification of suitable sampling and application points in a water system **S11**. Application of water treatment programmes to specific water system types e.g. cooling towers, steam boilers, heating and chilled systems etc. **S12**. Interpretation of test results and development of treatment programme improvements and recommendations **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 **Core Behaviours**: **B1**. Act professionally demonstrating dependability, determination, honesty and integrity. Respect others, act ethically and contribute to sustainable development. **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. **B4**. Be prepared to work reliably and safely and supervise the safe and effective operation of others. **Specialism Skills**: **Water Treatment Technician** **WTT S3**. Give presentations and demonstrations to customer/site personnel regarding treatment recommendations and control requirements **WTT S5**. Organise, construct, manage and report review meetings with customers/site personnel **Water Treatment Equipment Technician**

	WTE S3. b. Service a piece of water treatment equipment **WTE S4**. Assess the performance of a water system treatment programme **Legionella Risk Assessor** **LRA S1**. Carry out site/system investigations and surveys **LRA S5**. Prepare and present the assessment report findings to customer/site personnel **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 **Water Treatment Operations Supervisor** **WTS S1**. Complete water system surveys and produce system diagrams appropriate for the direction and management of a cleaning/disinfection project **WTS S3. b**. Service temporary operations equipment required to complete the project e.g. flushing pump stations, side stream filtration, cooling tower packing **WTS S5**. Supervise a team of Water Treatment Operatives and any associated subcontractors. **For amplification and guidance refer to the WTT Specification:** https://energyenvironmentawards.co.uk/epa/water-treatment-technician/
What tasks will I have to cover?	The task(s) must allow you to undertake the activities required for an observation. For further details refer to 'Knowledge, Skills and Behaviours (KSBs) Coverage' in the specification, refer to link above.
What resources can I use?	You are expected to use equipment and PPE required for the job:

	Equipment and resources needed for the observation will be provided by your employer or training provider and in good and safe working condition Relevant work instructions/manuals must be available in hard copy or electronically. Some documentation may be requested by the independent assessor in advance of the observation. This will help the observation to run smoothly.
How many questions will I be asked?	The independent assessor: • will ask a minimum of 3 questions • may ask questions to follow up in order to seek clarification from you
Who will assess me?	An independent assessor, appointed by Energy & Environment Awards.
Provisional Grading	The independent assessor will award a provisional grade. You must pass **ALL** the pass criteria in order to achieve a pass.
Overall grading for this component	Fail or Pass.

Practice Component 2: Observation

You should have an opportunity to have a practice observation which mirrors the real assessment. A practice practical would be set up for you using the structure in the table above by your employer or training provider.

Component 3: Professional Discussion Supported by a Portfolio

Overview

The professional discussion is based on your portfolio of evidence. It is to allow you to demonstrate how you have met the KSBs in order to carry out your occupational role as a Water Treatment Technician effectively and safely. The professional discussion allows for testing of responses where there are a range of potential answers that cannot be tested through the knowledge test.

Step-by-Step Guide

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

Who will assess me?	1 independent assessor, appointed by Energy & Environment Awards will assess you under examination conditions.
How will the professional discussion be organised?	**Locations:** Your professional discussion will take place at your employer's premises or a suitable venue. **Time:** Your professional discussion will be 1 hour 30 minutes – However, the independent assessor has the option to increase the time of your professional discussion by up to 10%, to allow you to complete your last answer. **Your professional discussion will be:** • a discussion between you and the independent assessor • face to face or remote, as agreed • assessed and outcomes will be recorded by the assessor on official Energy & Environment Awards professional discussion documents • recorded using the relevant technology such as Microsoft Teams or an audio recording device You will have access to your portfolio of evidence throughout the professional discussion.
What topics will I have to cover?	For further details refer to 'Knowledge, Skills and Behaviours (KSBs) coverage in the WTT Specification on pages 20 – 43. **A link to the WTT Specification is available on page 9.**

How many questions will I be asked?	• A minimum of 19 questions (based on the above topics) • Set questions which maybe contextualised to the contents of your portfolio • Follow-up questions in order to seek clarification
Provisional Grading	The independent assessor will award a provisional grade. You must pass **ALL** the pass criteria in order to achieve a pass. To achieve a distinction, you must achieve 4 out of 6 of the distinction criteria
Overall grading for this component	Fail, Pass or Distinction

Portfolio of Evidence Requirements

The requirements are as follows:

Portfolio Mapping Document

You must map your portfolio of evidence to the KSBs covered by the professional discussion. You must include a mapping document at the front of your portfolio that clearly references the location of the evidence in your portfolio.

For further guidance on how to map refer to:

- Section below 'How do I organise my portfolio of evidence and map it to the mapping document?'
- WTT Specification Section 5: Guidance on portfolio of evidence and apprentice mapping
- Apprentice Guide Supporting Documents Appendix B
- Specification Supporting Documents Appendix D for the portfolio mapping document

How do I organise my portfolio of evidence and map my evidence?

Step-by-Step Guide

You must include a portfolio mapping document and place it at the front of your portfolio, see table above for guidance and where to locate the portfolio mapping document.

Your portfolio is not assessed. It serves two purposes:

- The independent assessor reviews your portfolio before the professional discussion to help focus and contextualise their questions
- You should carefully prepare, index and map your portfolio as this will further support you during your professional discussion. Your organised portfolio will allow you with ease to refer to examples and discuss the evidence with the independent assessor

What should I include in my portfolio?

Quality vs quantity

You should be supported in selecting and mapping evidence for your portfolio by your employer or training provider.

We would advise you to choose the best pieces of evidence and map them to each KSB which will be covered during your professional discussion. To be confident of meeting the KSB, you should aim to have two/three pieces of evidence mapped to each KSB.

The portfolio is not assessed, but is used to provide information to support the professional discussion. Evidence must relate to 'real' work completed by you; evidence from simulated activities is not allowed.

A maximum of 30 pieces of evidence to demonstrate consistent achievement of quality and quantity. 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 you
- 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); you must be in a view and identifiable
- taped audio evidence

- quality achievement records
- maintenance records
- annotated photographs/diagrams

Any employer contributions should focus only on direct observation of evidence (for example witness statements) rather than opinions.

The above is not a definitive list. You can include other relevant evidence sources.

You **must not** include in your portfolio any methods of self-assessment.

Evidence must be:

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

What can I do to prepare for the professional discussion?

You should:

- be familiar with the structure of your portfolio
- know the KSBs covered by the professional discussion
- know where you have mapped your KSBs by referring to your portfolio mapping document
- ensure there is quality evidence to cover every KSB in the professional discussion
- practise mapping evidence and completing the evidence mapping grid
- know how you will be graded

The role of your employer or training provider

Employers or training providers are expected to support you in preparing your portfolio by:

- clarifying responsibility for supporting you in selecting and mapping evidence for your portfolio, including the role of employer coaches/mentors where applicable
- advising you on which pieces of evidence you should select to ensure that when it is looked at as a whole, your evidence provides coverage of all the

required elements of the standard (KSBs) assessed in the professional discussion

- supporting the mapping of your evidence and production of your mapping document
- authenticating evidence you provide is valid
- signing off your portfolio
- submitting your portfolio to Energy & Environment Awards as part of Gateway

Practice Component 3: Professional Discussion Supported by a Portfolio

You should have an opportunity to have a practice professional discussion which mirrors the real assessment. The practice professional discussion based on your portfolio of evidence would be set up using the structure in the table above by your employer or training provider.

Overall grading

All assessment components contribute equally to your overall EPA grade.

Grades from individual assessment components will be combined in the following way to determine your overall EPA grade as a whole.

Knowledge test	Observation	Professional Discussion	Overall grading
Fail	Any grade	Any grade	**Fail**
Any grade	Fail	Any grade	**Fail**
Any grade	Any grade	Fail	**Fail**
Pass	Pass	Pass OR Distinction	**Pass**
Pass OR Distinction	Pass	Pass	**Pass**
Distinction	Pass	Distinction	**Distinction**

Any grade = fail, pass or distinction

Section 4: Resits and retakes

If you fail one or more EPA components, you can re-sit or a re-take the failed component at your employer's discretion. Your 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. You should have a supportive action plan to prepare for your re-sit or re-take.

Your employer and Energy & Environment Awards will agree the timescale for your re-sit or re-take. Failed EPA component(s) must be re-sat or re-taken within the 3 months of the fail notification, otherwise the entire EPA will need to be re-sat or re-taken in full, unless in the opinion of Energy & Environment Awards exceptional circumstances apply outside the control of you or your employer.

The maximum grade awarded to a re-sit/re-take will be pass, unless Energy & Environment Awards identifies exceptional circumstances affecting the outcome of the original assessment.

Re-sits and re-takes will not be offered to you if you wish to move from pass to a higher grade.

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

Section 5: Appendices

Appendix A: Glossary

Appendix B: Portfolio Mapping Document

Appendix A: Glossary

Amplification – provides more detail on how individual knowledge, skills or behaviours statements should be interpreted. Where the KSB statements, themselves are deemed self-explanatory, no amplification is provided. Assessment may include questions on anything identified in the amplification

Behaviours –mindsets, attitudes or approaches needed for competence. Whilst these can be innate or instinctive, they can also be learnt. Behaviours tend to be very transferable. They may be more similar across occupations than knowledge and skills. For example, team worker, adaptable and professional

Elements – are the knowledge, skills and behaviours and what is needed to competently undertake the duties required for an occupational standard

Guidance – is only provided where it is required to support interpretation of the KSB statements

Gateway – the stage of the apprenticeship where the apprentice, employer and trainer determine whether the apprentice is ready to undertake the End-Point Assessment

Independent Assessor – Will holistically assess the knowledge, skills and behaviours (KSBs) that you have been taught throughout the apprenticeship. Their role as an Independent Assessor would involve assessing components 2 (observation) and 3 (professional discussion supported by your portfolio)

Knowledge – the information, technical detail, and 'know-how' that someone needs to have and understand to successfully carry out the duties. Some knowledge will be occupation-specific, whereas some may be more generic

Options / Pathways – a specialist route within an occupational standard that builds on the occupational competence for a new entrant to the occupation

Skills – the practical application of knowledge needed to successfully undertake the duties. They are learnt through on and/or off-the-job training or experience

Standard – An occupational standard is a description of an occupation. It contains occupational profile, and describes KSBs needed for someone to be competent in the occupation's duties. The occupational standards are developed by employers for occupations that meet the Institute for Apprenticeships & Technical Education current criteria. For further details refer to: https://skillsengland.education.gov.uk/apprenticeship-standards/st0453-v1-0

Topic - is a collection of elements grouped into a theme e.g., Health and Safety

Appendix B: Portfolio Mapping Document

Introduction

Throughout the on-programme part of the apprenticeship, you will need to keep compile a portfolio of evidence to support the requirements of the professional discussion.

The evidence within the portfolio will need to be mapped to the KSB requirements using the mapping document overleaf.
The independent assessor will use the mapping document to review the evidence in your portfolio in preparation for the professional discussion. The independent assessor will not assess the portfolio.

The portfolio mapping document below consists of

- pages 33-36 covering mapping for core requirements
- pages 37-39 covering mapping for the Water Treatment Technician option (WTT)
- pages 40-43 covering mapping for the Water Treatment Equipment Technician option (WTE)
- pages 44-47 covering mapping for the Legionella Risk Assessor option (LRA)
- pages 48-51 covering mapping for the Water Treatment Operations Supervisor option (WTS)

You should use the mapping pages for the core and the option you are following.

Your next steps

1. Complete all the details on the first page and include employer details of where relevant competencies from your experience at work was gained
2. Ensure each piece of evidence signed off by your tutor/supervisor/mentor and training provider. You can use a number of different types of evidence to demonstrate your competence as described in Section 5 of the Specification – 'What to include in the portfolio'. For further guidance, you must seek advice from your tutor/supervisor/mentor and training provider
3. Map evidence to the criteria in the following pages using a referencing system indicating where the evidence for the criteria is located in the portfolio e.g., work based evidence Job 1 (J1) page 5 paragraph 2. This will allow the

independent assessor to locate the section or specific piece of evidence being discussed and referred to during the professional discussion

4. Place the portfolio mapping document at the front of the portfolio of evidence.

Your training provider must make arrangements for Energy & Environment Awards to have access to your portfolio including the portfolio mapping document at Gateway. For those using e-portfolios such as ONEFILE or SMARTASSESSOR, the reference used must simply be the file or folder name you used when uploading the evidence to such systems.

Portfolio Mapping Document

Mapping Sign off on Portfolio Completion:

Place this portfolio mapping document at the front of your portfolio of evidence.

Apprentice Full Name (Print)	Apprentice Signature	Training Provider (Company)	Training Provider Signatory	Date of Sign Off

Pathway	

GROUP 1: (Core) Health, Safety and the Environment

Pass Criteria

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 &Safety at Work Act, L8, BS 2486, BS 8552 etc

Distinction Criteria

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

Ref.	Apprenticeship Standard Criteria	PORTFOLIO EVIDENCE REFERENCE (Apprentice Input)		
		1	2	3
S4	They should be able to contribute to the development of operational solutions and improvements e.g. safer working practices			

GROUP 2: (Core) Workplace attitude

Pass Criteria

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.

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

Distinction Criteria

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

Ref.	Apprenticeship Standard Criteria	PORTFOLIO EVIDENCE REFERENCE (Apprentice Input)		
		1	2	3
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			
B3	Display a self-disciplined, self-motivated, proactive approach to work, willing to make independent decisions and develop solutions and improvements to work practices			
B5	Be prepared to work effectively and efficiently maintaining good relationships with colleagues, clients, suppliers and the public			

Ref.	Apprenticeship Standard Criteria	PORTFOLIO EVIDENCE REFERENCE (Apprentice Input)		
		1	2	3
B6	Be receptive to feedback, willing to learn new skills and adjust to change			
B7	Demonstrate adherence to corporate policies on ethics, equality and diversity			

GROUP 3: (Core) Resource Management

Pass Criteria

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 e.g. WTE describe their equipment parts procurement procedure and work planning e.g. LRA describes the necessary site communication channels for access arrangements e.g. WTS explains the team selection criteria used and the reasons for the organisation of labour on site for the operation

Distinction Criteria

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

Ref.	Apprenticeship Standard Criteria	PORTFOLIO EVIDENCE REFERENCE (Apprentice Input)		
		1	2	3
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)			
S14	Use resources effectively including their own time management, the appropriate competence of staff chosen for the operation involved, the efficient use of staff resources and management of equipment required for specific work tasks			

GROUP 4: (WTT) Water system surveys, water system requirements and treatment programme design

Pass Criteria

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

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

Distinction Criteria

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

Ref.	Apprenticeship Standard Criteria	PORTFOLIO EVIDENCE REFERENCE (Apprentice Input)		
		1	2	3
WTT K1	Understand the water treatment requirements of specific water systems e.g. steam boilers, cooling towers etc			
WTT S1	Design, specify and recommend chemical water treatment programmes taking account of water supply quality and system operating conditions			

GROUP 5: (WTT) Evaluate the water treatment programme options for an application

Pass Criteria

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

Distinction Criteria

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

Explain the implications of selecting an unsuitable treatment option and how this could be rectified. e.g. incorrect biocide for a closed water system

Ref.	Apprenticeship Standard Criteria	PORTFOLIO EVIDENCE REFERENCE (Apprentice Input)		
		1	2	3
WTT K2	Understand the treatment options available for specific water systems e.g. pre-treatment plant, chemical treatment etc			
WTT S2a	Evaluate the suitability of alternative physical water treatment programmes for specific water systems and applications			
WTT S2b	Evaluate the suitability of alternative chemical water treatment programmes for specific water systems and applications			

GROUP 6: (WTT) Water treatment programme operational performance and assessment

Pass Criteria

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

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

Distinction Criteria

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

Ref.	Apprenticeship Standard Criteria	PORTFOLIO EVIDENCE REFERENCE (Apprentice Input)		
		1	2	3
S9	Assessment of relevant test parameters and sampling plan for specific water systems			
S10	Performance assessment and evaluation of water system conditions and operations utilising specific monitoring equipment			
S13	Identify, evaluate and resolve practical and technical problems encountered, assess suitability of the chemical and physical water treatment options employed and implement the required improvements to the treatment programme or service delivery			
WTT K3a	Acquire the knowledge required to assess the performance of water treatment programmes			
WTT K3b	Acquire the knowledge required to recommend improvements to water treatment programmes			
WTT S4	Assess the performance of a water system treatment programmes and provide recommendations for improvement			

GROUP 4: (WTE) Water system surveys, water system requirements and treatment programme design

Pass Criteria

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

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.

Distinction Criteria

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

Ref.	Apprenticeship Standard Criteria	PORTFOLIO EVIDENCE REFERENCE (Apprentice Input)		
		1	2	3
WTE K1	Understand the water treatment requirements of specific water applications and processes e.g. water used for pharmaceutical manufacturing, chemical treatment dosing			
WTE K3a	Acquire the knowledge required to install specific items of equipment relevant to their job role			
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			

Ref.	Apprenticeship Standard Criteria	PORTFOLIO EVIDENCE REFERENCE (Apprentice Input)		
		1	2	3
WTE S3a	Install and commission water treatment equipment			

GROUP 5: (WTE) Evaluate the water treatment programme options for an application

Pass Criteria

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

Distinction Criteria

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

Ref.	Apprenticeship Standard Criteria	PORTFOLIO EVIDENCE REFERENCE (Apprentice Input)		
		1	2	3
WTE K2	Understand the equipment options available and their relevant benefits			
WTE S2	Evaluate and design appropriate water treatment equipment installations			

GROUP 6: (WTE) Water treatment programme operational performance and assessment

Pass Criteria

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

Distinction Criteria

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

Ref.	Apprenticeship Standard Criteria	PORTFOLIO EVIDENCE REFERENCE (Apprentice Input)		
		1	2	3
S9	Assessment of relevant test parameters and sampling plan for specific water systems			
S10	Performance assessment and evaluation of water system conditions and operations utilising specific monitoring equipment			
S13	Identify, evaluate and resolve practical and technical problems encountered, assess suitability of the chemical and physical water treatment options employed and implement the required improvements to the treatment programme or service delivery			
WTE K3b	Acquire the knowledge required to service specific items of equipment relevant to their job role			

Ref.	Apprenticeship Standard Criteria	PORTFOLIO EVIDENCE REFERENCE (Apprentice Input)		
		1	2	3
WTE K3c	Acquire the knowledge required to maintain specific items of equipment relevant to their job role			

GROUP 7: (WTE) Health, Safety and the Environment

Pass Criteria

Apply a safety first approach for themselves and colleagues keeping themselves and others safe

Undertake and document work place 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

Distinction Criteria

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

Ref.	Apprenticeship Standard Criteria	PORTFOLIO EVIDENCE REFERENCE (Apprentice Input)		
		1	2	3
WTE S5	Supervise a team and manage the health, safety and environment of a water treatment equipment installation and/or operation			

GROUP 4: (LRA) Water system surveys, water system requirements and treatment programme design

Pass Criteria

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

Distinction Criteria

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

Ref.	Apprenticeship Standard Criteria	PORTFOLIO EVIDENCE REFERENCE (Apprentice Input)		
		1	2	3
LRA K4	Understand the principles of design for water systems and water treatment equipment e.g. water tanks, calorifiers, softeners etc			
LRA S2	Prepare water system diagrams and drawings			

GROUP 5: (LRA) Evaluate the water treatment programme options for an application

Pass Criteria

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

Distinction Criteria

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

Demonstrate an understanding of the cost implications of recommended remedial actions e.g. comparative cost of tank refurbishment versus replacement

Ref.	Apprenticeship Standard Criteria	PORTFOLIO EVIDENCE REFERENCE (Apprentice Input)		
		1	2	3
LRA K3	Understand the application of water treatment programmes for specific water systems			
LRA K5	Acquire the knowledge required to recommend remedial actions, optional system improvements and management requirements			
LRA S4	Identify remedial, improvement and management actions required to minimise any risk presented			

GROUP 6: (LRA) Water treatment programme operational performance and assessment

Pass Criteria

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

Distinction Criteria

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

Ref.	Apprenticeship Standard Criteria	PORTFOLIO EVIDENCE REFERENCE (Apprentice Input)		
		1	2	3
S9	Assessment of relevant test parameters and sampling plan for specific water systems			
S10	Performance assessment and evaluation of water system conditions and operations utilising specific monitoring equipment			
S13	Identify, evaluate and resolve practical and technical problems encountered, assess suitability of the chemical and physical water treatment options employed and implement the required improvements to the treatment programme or service delivery			
LRA K2	Understand the principles of risk assessment and the identification of hazards in water systems			

Ref.	Apprenticeship Standard Criteria	PORTFOLIO EVIDENCE REFERENCE (Apprentice Input)		
		1	2	3
LRA S3	Assess the comparative risk of Legionellosis presented by specific water systems			

GROUP 7: (LRA) Health, Safety and the Environment

Pass Criteria

Identify the main Health and Safety and compliance requirements relevant to the production of a legionella risk assessment

Distinction Criteria

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

Ref.	Apprenticeship Standard Criteria	PORTFOLIO EVIDENCE REFERENCE (Apprentice Input)		
		1	2	3
LRA K1	Know and understand any regulatory requirements and guidance appropriate to the water systems being assessed			

GROUP 4: (WTS) Water system surveys, water system requirements and treatment programme design

Pass Criteria

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

Distinction Criteria

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

Ref.	Apprenticeship Standard Criteria	PORTFOLIO EVIDENCE REFERENCE (Apprentice Input)		
		1	2	3
WTS K1	Understand the water treatment requirements of specific water systems e.g. drinking water systems, process water systems etc.			
WTS S2	Understand and apply chemical cleaning and disinfection programmes for specific water systems			

GROUP 5: (WTS) Evaluate the water treatment programme options for an application

Pass Criteria

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

Distinction Criteria

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 benefits for the customer of completing the cleaning procedure e.g. improvement in heat transfer processes derived from a cleaning procedure

Ref.	Apprenticeship Standard Criteria	PORTFOLIO EVIDENCE REFERENCE (Apprentice Input)		
		1	2	3
WTS K2a	Understand chemical cleaning programme options for specific water systems and processes			
WTS K2b	Understand disinfection programme options for specific water systems and processes			

GROUP 6: (WTS) Water treatment programme operational performance and assessment

Pass Criteria

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

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

Distinction Criteria

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

Ref.	Apprenticeship Standard Criteria	PORTFOLIO EVIDENCE REFERENCE (Apprentice Input)		
		1	2	3
S9	Assessment of relevant test parameters and sampling plan for specific water systems			
S10	Performance assessment and evaluation of water system conditions and operations utilising specific monitoring equipment			
S13	Identify, evaluate and resolve practical and technical problems encountered, assess suitability of the chemical and physical water treatment options employed and implement the required improvements to the treatment programme or service delivery			
WTS K3	Acquire the knowledge required to assess the performance of water treatment cleaning/disinfection operation			

WTS S3a	Install and commission temporary operations equipment required to complete the project e.g. flushing pump stations, side stream filtration, cooling tower packing			
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			

GROUP 7: (WTS) Health, Safety and the Environment

Pass Criteria

Apply a safety first approach for themselves and colleagues keeping themselves and others safe.

Undertake and document work place risk assessments and hazard reviews in accordance with company procedures.

Distinction Criteria

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

Ref.	Apprenticeship Standard Criteria	PORTFOLIO EVIDENCE REFERENCE (Apprentice Input)		
		1	2	3
WTS K4	Understand the risks involved, the relevant Health and Safety regulations associated with the project and specific requirements of the project site			
WTS S6	Produce a method statement and control scheme to manage the health, safety and environment during the various phases of a project			