



# WATER INDUSTRY TREATMENT PROCESS TECHNICIAN

## Key information

**Reference:** ST1291

**Version:** 1.0

**Level:** 3

**Typical duration to gateway:** 36 months

**Typical EPA period:** 4 months

**Maximum funding:** £16000

**Route:** Engineering and manufacturing

**Date updated:** 22/09/2022

**Approved for delivery:** 13 September 2022

**EQA provider:** Ofqual

This apprenticeship has options. This document is currently showing the following option:

All



## End-point assessment plan

Version 1.0

### Introduction and overview

This document explains the requirements for end-point assessment (EPA) for the water industry treatment process technician apprenticeship. End-point assessment organisations (EPAOs) must follow this when designing and delivering the EPA.

Water industry treatment process technician apprentices, their employers and training providers should read this document.

An approved EPAO must conduct the EPA for this apprenticeship. Employers must select an approved EPAO from the Education and Skills Funding Agency's Register of end-point assessment organisations (RoEPAO).

A full-time apprentice typically spends 36 months on-programme (this means in training before the gateway) working towards competence as a water industry treatment process technician. The apprentice must spend at least 12 months on-programme. The apprentice must complete the required amount of off-the-job training specified by the apprenticeship funding rules.

This EPA has 3 assessment methods.

The grades available for each assessment method are:

Assessment method 1 - observation with questions:

- fail
- pass
- distinction

Assessment method 2 - interview underpinned by a portfolio of evidence:

- fail
- pass
- distinction

Assessment method 3 - multiple-choice test:

- fail
- pass
- distinction

The result from each assessment method is combined to decide the overall apprenticeship grade. The following grades are available for the apprenticeship:

- fail
- pass
- merit
- distinction

## **EPA summary table**

<p><b>On-programme (typically 36 months)</b></p>	<p>The apprentice must complete training to develop the knowledge, skills and behaviours (KSBs) of the occupational standard.</p> <p>The apprentice must complete training towards English and maths qualifications in line with the apprenticeship funding rules. This includes those with an education, health and care plan or a legacy statement. British sign language (BSL) qualifications are an alternative to English qualifications for those who have BSL as their primary language.</p> <p>The apprentice must compile a portfolio of evidence.</p>
<p><b>End-point assessment gateway</b></p>	<p>The apprentice's employer must be content that the apprentice is working at or above the occupational standard.</p> <p>The apprentice's employer must confirm that they think the apprentice:</p> <ul style="list-style-type: none"> <li>• is working at or above the occupational standard as a water industry treatment process technician</li> <li>• has the evidence required to pass the gateway and is ready to take the EPA</li> </ul> <p>The apprentice must have achieved English and maths qualifications in line with the apprenticeship funding rules. This includes those with an education, health and care plan or a legacy statement. British sign language (BSL) qualifications are an alternative to English qualifications for those who have BSL as their primary language.</p> <p>For the interview underpinned by a portfolio of evidence, the apprentice must submit a portfolio of evidence.</p> <p>The apprentice must submit any policies and procedures as requested by the EPAO.</p>
<p><b>End-point assessment (typically 4 months)</b></p>	<p><b>Grades available for each assessment method:</b></p> <p>Observation with questions</p> <ul style="list-style-type: none"> <li>• fail</li> <li>• pass</li> <li>• distinction</li> </ul> <p>Interview underpinned by a portfolio of evidence</p>

	<ul style="list-style-type: none"> <li>• fail</li> <li>• pass</li> <li>• distinction</li> </ul> <p>Multiple-choice test</p> <ul style="list-style-type: none"> <li>• fail</li> <li>• pass</li> <li>• distinction</li> </ul> <p><b>Overall EPA and apprenticeship can be graded:</b></p> <ul style="list-style-type: none"> <li>• fail</li> <li>• pass</li> <li>• merit</li> <li>• distinction</li> </ul>
<p><b>Professional recognition</b></p>	<p>This apprenticeship aligns with The Institute of Water for Registered Environmental Technician (REnvTech). The experience gained and responsibility held by the apprentice on completion of the apprenticeship will either wholly or partially satisfy the requirements for registration at this level.</p> <p>This apprenticeship aligns with The Institute of Water for Engineering Technician (EngTech). The experience gained and responsibility held by the apprentice on completion of the apprenticeship will either wholly or partially satisfy the requirements for registration at this level.</p> <p>This apprenticeship aligns with The Science Council for Registered Science Technician (RSciTech). Upon successful completion of the apprenticeship and upon receipt of the apprenticeship certificate, individuals are eligible to apply for RSciTech through a shortened application route. Individuals also need to be a member of a professional body that is licensed by the Science Council to be awarded this status. Further information is on the Science Council's website.</p>
<p><b>Re-sits and re-takes</b></p>	<ul style="list-style-type: none"> <li>• Re-take and re-sit grade cap: pass</li> <li>• Re-sit timeframe: typically 2 months</li> <li>• Re-take timeframe: typically 4 months</li> </ul>

## Duration of end-point assessment period

The EPA is taken in the EPA period. The EPA period starts when the EPAO confirms the gateway requirements have been met and is typically 4 months.

The EPAO should confirm the gateway requirements have been met and the EPA should start as quickly as possible.

## EPA gateway

The apprentice's employer must confirm that they think their apprentice is working at or above the occupational standard. The apprentice will then enter the gateway. The employer may take advice from the apprentice's training provider(s), but they must make the decision.

The apprentice must meet the gateway requirements before starting their EPA.

These are:

- achieved English and mathematics (including those with an education, health and care plan or a legacy statement) as specified by the apprenticeship funding rules. British Sign Language (BSL) qualifications are an alternative to English qualifications for those who have BSL as their primary language.
- for the interview underpinned by a portfolio of evidence, the apprentice must submit a portfolio of evidence

### Portfolio of evidence requirements:

The apprentice must compile a portfolio of evidence during the on-programme period of the apprenticeship. It should only contain evidence related to the KSBs that will be assessed by this assessment method. It will typically contain 10 discrete pieces of evidence. Evidence must be mapped against the KSBs. Evidence may be used to demonstrate more than one KSB; a qualitative as opposed to quantitative approach is suggested.

Evidence sources may include:

- workplace documentation and records, for example:
- workplace policies and procedures
- witness statements
- annotated photographs
- video clips (maximum total duration 20 minutes); the apprentice must be in view and identifiable

This is not a definitive list; other evidence sources can be included.

The portfolio of evidence should not include reflective accounts or any methods of self-assessment. Any employer contributions should focus on direct observation of performance (for example, witness statements) rather than opinions. The evidence provided should be valid and attributable to the apprentice; the portfolio of evidence should contain a statement from the employer and apprentice confirming this.

The EPAO should not assess the portfolio of evidence directly as it underpins the interview. The independent assessor should review the portfolio of evidence to prepare questions for the interview. They are not required to provide feedback after this review.

The apprentice must submit any policies and procedures as requested by the EPAO.

## Assessment methods

The assessment methods can be delivered in any order.

The result of one assessment method does not need to be known before starting the next.

## Observation with questions

### Overview

In the observation with questions, an independent assessor observes the apprentice in their workplace and asks questions. The apprentice completes their day-to-day duties under normal working conditions. Simulation is not permitted. It gives the apprentice the opportunity to demonstrate the KSBs mapped to this assessment method.

### Rationale

This assessment method is being used because:

- this is a practical role, best demonstrated through completing tasks in a real work setting
- observation makes use of employer resources and equipment which will be familiar to the apprentice and thus allow them to perform at their best
- tasks completed during the observation should contribute to workplace productivity and are valid
- it is a holistic assessment method

### Delivery

The observation with questions must be structured to give the apprentice the opportunity to demonstrate the KSBs mapped to this assessment method to the highest available grade.

An independent assessor must conduct and assess the observation with questions.

The independent assessor must only observe one apprentice at a time to ensure quality and rigour. They must be as unobtrusive as possible.

The EPAO must give an apprentice 2 weeks' notice of the observation with questions.

The observation must take 6 hours.

The independent assessor can increase the time of the observation with questions by up to 10%. This time is to allow the apprentice to complete a task or respond to a question if necessary.

The observation may be split into discrete sections held on the same working day.

The EPAO must manage invigilation of the apprentice during the assessment, to maintain security of the EPA, in line with their malpractice policy. This includes breaks and moving between locations during the working day.

The independent assessor must explain to the apprentice the format and timescales of the observation with questions before it starts. This does not count towards the assessment time.

The independent assessor should observe the following during the observation:

- maintaining site security
- maintaining site standards and safety including completing a risk assessment
- ensuring vital safety equipment is maintained and available for use
- communicating verbally
- completing documentation
- managing water or wastewater treatment processes and process standards
- sampling and analysis

The activities will be observed in the context of the apprentice's occupational context (option): water or wastewater.

These activities provide the apprentice with the opportunity to demonstrate the KSBs mapped to this assessment method.

The independent assessor must ask questions. The purpose of the independent assessor's questions is to test the apprentice's breadth and depth of underpinning knowledge against the grading descriptors.

Questioning can occur both during and after the observation. The time for questioning is included in the overall assessment time. The independent assessor must ask at least 6 questions. To remain as unobtrusive as possible, the independent assessor should ask questions during natural stops between tasks and after completion of work rather than disrupting the apprentice's flow. Follow-up questions are allowed where clarification is required. The independent assessor must use the questions from the EPAO's question bank or create their own questions in-line with the EPAO's training.

The independent assessor must ask questions about KSBs that were not observed to gather assessment evidence. These questions are in addition to the above set number of questions for the observation with questions and should be kept to a minimum.

The independent assessor must make the grading decision. The observation and responses to questions must be assessed holistically by the independent assessor when they are deciding the grade.

The independent assessor must keep accurate records of the assessment. They must record:

- the KSBs observed
- the apprentice's answers to questions
- the KSBs demonstrated in answers to questions



- the grade achieved

## Assessment location

The observation with questions must take place in the apprentice's normal place of work (for example their employer's premises or a customer's premises). Equipment and resources needed for the observation must be provided by the employer and be in good and safe working condition.

Questioning that occurs after the observation should take place in a quiet room, free from distractions and influence.

## Question and resource development

The EPAO must develop a purpose-built assessment specification and question bank. It is recommended this is done in consultation with employers of this occupation. The EPAO should maintain the security and confidentiality of EPA materials when consulting employers. The assessment specification and question bank must be reviewed at least once a year to ensure they remain fit-for-purpose.

The assessment specification must be relevant to the occupation and demonstrate how to assess the KSBs mapped to this assessment method. The EPAO must ensure that questions are refined and developed to a high standard. The questions must be unpredictable. A question bank of sufficient size will support this.

The EPAO must produce the following materials to support the observation with questions:

- independent assessor assessment materials which include:
  - training materials
  - administration materials
  - moderation and standardisation materials
  - guidance materials
  - grading guidance
  - question bank
- EPA guidance for the apprentice and the employer

The EPAO must ensure that the EPA materials are subject to quality assurance procedures including standardisation, training, and moderation.

## Interview underpinned by a portfolio of evidence

### Overview

In the interview, an independent assessor asks the apprentice questions. The apprentice can refer to and illustrate their answers with evidence from their portfolio of evidence. It gives the apprentice the opportunity to demonstrate the KSBs mapped to this assessment method.

### Rationale

This assessment method is being used because:



- it allows for assessment of KSBs that do not occur on a predictable or regular basis
- it allows for testing of responses where there are a range of potential answers that cannot be tested through the multiple-choice test
- it can be conducted remotely, potentially reducing cost

## Delivery

The interview must be structured to give the apprentice the opportunity to demonstrate the KSBs mapped to this assessment method to the highest available grade.

An independent assessor must conduct and assess the interview.

The purpose of the independent assessor's questions is to cover the following themes:

### Core

- working in the water industry
- environment and sustainability
- asset and equipment maintenance
- responding to alarms
- improvement and optimisation
- resolving faults
- responding to incidents
- team working
- information technology

The themes will be assessed in the context of the apprentice's occupational context (option): water or wastewater.

### Option 1. Water treatment process technician

- water catchment and abstraction
- waste streams management
- shut down, isolation and recommission of water process streams

### Option 2. Wastewater treatment process technician

- pumping operations
- wastewater flows
- shut down, isolation and recommission of wastewater process streams

The activities will be assessed in the context of the apprentice's occupational context (option): water or wastewater.

The EPAO must give an apprentice 2 weeks' notice of the interview.

The independent assessor must have at least 2 weeks' to review the supporting documentation. The apprentice must have access to their portfolio of evidence during the interview.

The apprentice can refer to and illustrate their answers with evidence from their portfolio of evidence however, it is not directly assessed.

The interview must last for 90 minutes. The independent assessor can increase the time of the interview by up to 10%. This time is to allow the apprentice to respond to a question if necessary.

The independent assessor must ask at least 12 questions. Follow-up questions are allowed where clarification is required. The independent assessor must use the questions from their EPAO's question bank or create their own questions in-line with the EPAO's training.

The independent assessor must make the grading decision. The independent assessor must keep accurate records of the assessment. They must record:

- the apprentice's answers to questions
- the KSBs demonstrated in answers to questions
- the grade achieved

### **Assessment location**

The interview must take place in a suitable venue selected by the EPAO (for example the EPAO's or employer's premises).

The interview can be conducted by video conferencing. The EPAO must have processes in place to verify the identity of the apprentice and ensure the apprentice is not being aided.

The interview should take place in a quiet room, free from distractions and influence.

### **Question and resource development**

The EPAO must develop a purpose-built assessment specification and question bank. It is recommended this is done in consultation with employers of this occupation. The EPAO should maintain the security and confidentiality of EPA materials when consulting employers. The assessment specification and question bank must be reviewed at least once a year to ensure they remain fit-for-purpose.

The assessment specification must be relevant to the occupation and demonstrate how to assess the KSBs mapped to this assessment method. The EPAO must ensure that questions are refined and developed to a high standard. The questions must be unpredictable. A question bank of sufficient size will support this.

The EPAO must ensure that apprentice has a different set of questions in the case of re-sits or re-takes.

The EPAO must produce the following materials to support the interview underpinned by a portfolio of evidence:

- independent assessor assessment materials which include:
- training materials

- administration materials
- moderation and standardisation materials
- guidance materials
- grading guidance
- question bank
- EPA guidance for the apprentice and the employer

The EPAO must ensure that the EPA materials are subject to quality assurance procedures including standardisation, training, and moderation.

## Multiple-choice test

### Overview

In the multiple-choice test, the apprentice answers questions in a controlled and invigilated environment. It gives the apprentice the opportunity to demonstrate the knowledge mapped to this assessment method.

### Rationale

This assessment method is being used because:

- it allows for the efficient testing of knowledge where there is a right or wrong answer
- it allows for flexibility in terms of when, where, and how it is taken
- it allows larger volumes of apprentices to be assessed at one time

### Delivery

The multiple-choice test must be structured to give the apprentice the opportunity to demonstrate the knowledge mapped to this assessment method to the highest available grade.

The multiple-choice test can be computer or paper based.

The multiple-choice test must consist of 50 multiple-choice questions.

Multiple-choice questions must have four options, with one correct answer.

The apprentice must be given at least 2 weeks' notice of the date and time of the multiple-choice test.

### Test administration

The apprentice must have 90 minutes to complete the test.

The multiple-choice test is closed book which means that the apprentice cannot refer to reference books or materials whilst taking the test.

The multiple-choice test must be taken in the presence of an invigilator under the responsibility of the EPAO.

The EPAO must have an invigilation policy setting out how the multiple-choice test must be conducted. It must state the ratio of apprentices to invigilators for the setting and allow the test to take place in a secure way.

The EPAO is responsible for the security of the multiple-choice test including the arrangements for on-line testing. The EPAO must ensure that their security arrangements maintain the validity and reliability of the multiple-choice test.

## Marking

The multiple-choice test must be marked by an independent assessor or marker employed by the EPAO. They must follow a marking scheme produced by the EPAO. Marking by computer is allowed.

A correct answer gets 1 mark.

Any incorrect or missing answers get zero marks.

The EPAO is responsible for overseeing the marking of the multiple-choice test. The EPAO must ensure standardisation and moderation of the multiple-choice test.

## Assessment location

The apprentice must take the multiple-choice test in a suitably controlled and invigilated environment that is a quiet room, free from distractions and influence. The EPAO must check the venue is suitable.

The multiple-choice test may take place remotely if the appropriate technology and systems are in place to prevent malpractice. The EPAO must ensure invigilation of the apprentice for example with, and not limited to, 360-degree cameras and screen sharing facilities.

## Question and resource development

The EPAO must develop a purpose-built assessment specification and question bank. It is recommended this is done in consultation with employers of this occupation. The EPAO should maintain the security and confidentiality of EPA materials when consulting employers. The assessment specification and question bank must be reviewed at least once a year to ensure they remain fit-for-purpose.

The assessment specification must be relevant to the occupation and demonstrate how to assess the KSBs mapped to this assessment method. The EPAO must ensure that questions are refined and developed to a high standard. The questions must be unpredictable. A question bank of sufficient size will support this.

The EPAO must ensure that apprentice has a different set of questions in the case of re-sits or re-takes.

The EPAO must produce the following materials to support the multiple-choice test:

- independent assessor assessment materials which include:
  - training materials
  - administration materials

- moderation and standardisation materials
  - guidance materials
  - grading guidance
  - test specification
  - sample test and mark schemes
  - live tests and mark schemes
  - question bank
- EPA guidance for the apprentice and the employer

The EPAO must ensure that the EPA materials are subject to quality assurance procedures including standardisation, training, and moderation.

## Grading

### Observation with questions

Fail - does not meet pass criteria

THEME KSBS	PASS APPRENTICES MUST DEMONSTRATE ALL THE PASS DESCRIPTORS	DISTINCTION APPRENTICES MUST DEMONSTRATE ALL THE PASS DESCRIPTORS AND ALL OF THE DISTINCTION DESCRIPTORS
(Core) Work preparation <a href="#">S22</a>	Reads and interprets written information correctly to establish task requirements. (S22)	None
(Core) Work environment <a href="#">S13 S14 S15 S16 B1</a>	Identifies and documents risks and hazards and applies control measures in-line with company procedures. (S14)  Prioritises and promotes public health, workplace health and safety, and security by complying with health and safety regulations, safe working practices and procedures, following site security procedures and applying site standards for housekeeping to ensure the working environment is safe for themselves and others. (S13, S15, S16, B1)	Justifies how control measures have the potential to minimise risks. (S14)
(Core) Safety equipment <a href="#">S11</a>	Inspects and checks safety equipment against requirements, identifying and acting in line with procedures where there are issues. (S11)	None
(Core) Communication <a href="#">K21 S26 B3</a>	Applies a professional approach using verbal, written and electronic communication techniques suitable for the context, adapting style and use of terminology to suit the audience. Uses sector and industry terminology correctly. (K21, S26, B3)	None
(Core) Documentation <a href="#">K19 S23</a>	Completes work records required for tasks in full and correctly. (K19, S23)	Explains the importance of data gathering and flow of documentation for wider use across the business. For example, performance commitments (outcome delivery incentives). (K19)
(Water treatment process technician)	Takes responsibility to complete processes within limits of authority in compliance with industry regulations and company	Evaluates data from electronic control systems to mitigate against potential issues. (S9)

<p>Water treatment and process standards <a href="#">K9</a> <a href="#">K10</a> <a href="#">K30</a> <a href="#">S1</a> <a href="#">S9</a> <a href="#">S10</a> <a href="#">S30</a> <a href="#">S31</a> <a href="#">S34</a> <a href="#">S35</a> <a href="#">B4</a></p>	<p>operational and quality procedures, escalating issues outside of limits of authority. (K10, S1, B4)</p> <p>Interrogates and interprets electronic control systems correctly. (S9)</p> <p>Monitors and controls water chemical dosing in line with company procedures. (S30)</p> <p>Operates water process control equipment and instrumentation in line with company's or manufacturer's instructions. (K9, S31)</p> <p>Uses data monitoring and control systems to monitor and control water treatment processes and performance within company tolerances, responding in line with company procedures. (K30, S10, S34)</p> <p>Monitors and controls the effectiveness of disinfection following procedures to achieve performance in line with water supply regulations. (S35)</p>	<p>Analyses water treatment processes and performance approach in terms of optimisation. (K30)</p>
<p>(Water treatment process technician) Water sampling and analysis <a href="#">K28</a> <a href="#">S32</a> <a href="#">S33</a></p>	<p><del>Takes representative water samples</del> in line with company procedures. Analyses and interprets on-site laboratory data and water quality monitoring instrumentation accurately, checking against water process parameters and taking action in line with company procedures for example recording, escalation, validation. (K28, S32, S33)</p>	<p>Explains the importance of completing water sampling correctly and the impact of deviating samples. (K28)</p>
<p>(Wastewater treatment process technician) Wastewater treatment and process standards <a href="#">K34</a></p>	<p>Takes responsibility to complete processes within limits of authority in compliance with industry regulations and company operational and quality procedures, escalating issues outside of limits of authority. (K10, S1, B4)</p>	<p>Evaluates data from electronic control systems to mitigate against potential issues. (S9)</p> <p>Analyses wastewater treatment processes and performance in terms of optimisation. (S45)</p>



<p>S40 S43 S44 S45</p>	<p>Interrogates and interprets electronic control systems accurately. (S9) Operates wastewater process control equipment and instrumentation in line with company's or manufacturer's instructions. (K9, S40)</p> <p>Monitors and maintains grit removal and screening assets in line with company policies (permits). (S43)</p> <p>Monitors and controls in the performance of sedimentation, biological and chemical treatment operations line with company procedures. (K34, S44)</p> <p>Uses data monitoring and control systems to monitor and control wastewater treatment processes and performance within company tolerances, responding in line with company procedures. (S10, S45)</p>	
<p>(Wastewater treatment process technician) Wastewater monitoring and sampling and analysis K35 S41 S42</p>	<p>Takes representative wastewater samples in line with company procedures. Analyses and interprets on-site testing equipment data and monitoring equipment correctly, checking against wastewater process parameters and taking action in line with company procedures for example recording, escalation, validation. (K35, S41, S42)</p>	<p>Explains the importance of completing wastewater sampling correctly and the impact of deviating samples. (K35)</p>
<p>(Wastewater treatment process technician) Risks of working in wastewater K38 S47</p>	<p>Follows wastewater hygiene personal company procedures for example, correct use of personal protective equipment. (K38, S47)</p>	<p>None</p>

## Interview underpinned by a portfolio of evidence

Fail - does not meet pass criteria

THEME KSBS	PASS APPRENTICES MUST DEMONSTRATE ALL THE PASS DESCRIPTORS	DISTINCTION APPRENTICES MUST DEMONSTRATE ALL THE PASS DESCRIPTORS AND ALL OF THE DISTINCTION DESCRIPTORS
(Core) Working in the water industry <a href="#">K2 K3 S21</a>	Explains their role, identifying how they work with different teams and functions involved in operations. (K2, S21)  Explains business operation considerations. (K3)	None
(Core) Environmental and sustainability <a href="#">S18 S19 B2</a>	Describes how they comply with environmental and sustainability regulations and procedures and apply the principles of sustainable development in line with regulations and company procedures. (S18, S19)  Describes how they prioritise and promote the environment and sustainability in the workplace. (B2)	Evaluates the actual or potential value of a specific sustainable development approach. (S19)
(Core) Asset and equipment maintenance <a href="#">K6 S3 S4 S5 S6</a>	Describes how they inspect and check assets in line with manufacturer's or company's procedures, identifying action required to address immediate issues. Describes how they monitor first line maintenance of process control equipment and instrumentation in line with manufacturer's or company's requirements. (K6, S3, S6)  Describes how they follow procedures to safely remove assets for routine maintenance and recommission. (S4)  Describes how they carry out validation or instrument checks of online equipment in line with manufacturer's or company's requirements, identifying action to resolve issues. (S5)	Explains how they have identified action for future planned preventative maintenance, based on evidence, to reduce or potentially reduce risk of future failure. (K6, S6)
(Core) Improvement	Describes how they consider, identify, and promote areas for treatment process and asset	Evaluates the actual or potential value of a specific optimisation improvement suggestion. (K13, S8)

and optimisation K13 S8	optimisation improvement for example, in relation to quality, cost, time, safety, and impact. (K13, S8)	
(Core) Responding to alarms S2	Describes how they follow alarm intervention procedures and resolve alarm issues for example, nuisance alarms. (S2)	None
(Core) Resolving faults K15 S7	Describes how they apply fault-finding and problem-solving techniques, identifying the root cause of issues and resolving faults in line with procedures. (K15, S7)	None
(Core) Responding to incidents K11 S12 S17 S20	Describes how they identify control measures to mitigate potential issues and instigate incident escalation procedures. (S12)  Describes how they follow procedures for a given incident or emergency situation. (K11, S17)  Describes how they conduct and assess the impact of activity and apply control measures. (S20)	None
(Core) Team working K20 K22 K23 S25 S27 B5 B6 B7	Describes how they plan and organise work and resources using appropriate techniques and respond and adapt to meet work demands. (K20, S25, B6)  Describes how they liaise, negotiate, and handle conflict in individual and or group environments to achieve desired outcomes. (S27)  Describes how they support others to meet the team's work goals using team working techniques and taking account of equality, diversity and inclusion. (K22, K23, B5)  Describes CPD they have undertaken and future plans for CPD, explaining how they keep up to date with industry and individual development. Explains what the impact of their CPD has been and	Describes how they achieve efficiencies in the use of time or resources. (K20, S25)

	how it has benefited others and the business. (B7)	
(Core) Information technology <a href="#">K18 S24</a>	Describes how they use information technology for different purposes (email, word processing, spreadsheets, presentation, remote working platforms, work and asset management systems). Explains measures they take to comply with general data protection regulations (GDPR) and cyber security and why it is important. (K18, S24)	None
(Water treatment process technician) Water catchment and abstraction <a href="#">K29 S28 S29</a>	Describes how they select raw water source or blend of sources, managing and protecting catchment in line with licenses, parameters, other users, and procedures. Explains the impact of breach of catchment management permits on the business. (K29, S28)  Describes how they monitor and control water abstraction in line with procedures. (S29)	None
(Water treatment process technician) Waste streams management <a href="#">S36</a>	Describes how they monitor and control waste stream processes and performance to achieve compliance. (S36)	None
(Water treatment process technician) Shut down, isolation and recommission of water process streams <a href="#">K8</a> <a href="#">K14 S37</a>	Describes how they apply procedures to shut-down, isolate, and re-commission water process streams in line with procedures and impact on asset optimisation and performance. (K8, K14, S37)	Explains how the process needs to be adapted during shutdown to maintain compliance and control risk. (K8)
(Wastewater	Describes how they control internal	None

treatment process technician) Pumping operations S39	pumping operations to meet operational requirements. (S39)	
(Wastewater treatment process technician) Wastewater flows K40 S38	Describes how they monitor and control incoming wastewater flows in line with permits and parameters. Explains the impact of breach of permits on the business. (K40, S38)	None
(Wastewater treatment process technician) Shut down, isolation and recommission of wastewater process streams S46	Describes how they apply procedures to shut-down, isolate, and re-commission wastewater process streams in line with procedures and impact on asset optimisation and performance. (K8, K14, S46)	Explains how the process needs to be adapted during shutdown to maintain compliance and control risk. (K8)

## Multiple-choice test

GRADE	MINIMUM MARKS REQUIRED	MAXIMUM MARKS REQUIRED
Fail	0	34
Pass	35	42
Distinction	43	50

## Overall EPA grading

Performance in the EPA determines the apprenticeship grade of:

- fail
- pass
- merit
- distinction

An independent assessor must individually grade the: observation with questions and interview underpinned by a portfolio of evidence in line with this EPA plan.

The EPAO must combine the individual assessment method grades to determine the overall EPA grade.

If the apprentice fails one or more assessment methods, they will be awarded an overall fail.

To achieve an overall pass, the apprentice must achieve at least a pass in all the assessment methods. To achieve an overall EPA merit, the apprentice must achieve a distinction in any two of the assessment methods and a pass in the other. To achieve an overall EPA distinction, the apprentice must achieve a distinction in all three assessment methods.

Grades from individual assessment methods must be combined in the following way to determine the grade of the EPA overall.

OBSERVATION WITH QUESTIONS	INTERVIEW UNDERPINNED BY A PORTFOLIO OF EVIDENCE	MULTIPLE-CHOICE TEST	OVERALL GRADING
Any grade	Any grade	Fail	Fail
Fail	Any grade	Any grade	Fail
Any grade	Fail	Any grade	Fail
Pass	Pass	Pass	Pass
Pass	Distinction	Pass	Pass
Pass	Pass	Distinction	Pass
Distinction	Pass	Pass	Pass
Distinction	Pass	Distinction	Merit
Distinction	Distinction	Pass	Merit
Pass	Distinction	Distinction	Merit
Distinction	Distinction	Distinction	Distinction

## Re-sits and re-takes

Apprentices who fail one or more EPA method(s) can take a re-sit or a re-take 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, whereas a re-take does.

Apprentices should have a supportive action plan to prepare for a re-sit or a re-take.

The employer and EPAO agree the timescale for a re-sit or re-take. A re-sit is typically taken within 2 months of the EPA outcome notification. The timescale for a re-take is dependent on how much

re-training is required and is typically taken within 4 months of the EPA outcome notification.

Failed EPA methods must be re-sat or re-taken within a 6-month period from the EPA outcome notification, otherwise the entire 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 EPA grade of pass for a re-sit or re-take, unless the EPAO determines there are exceptional circumstances.

## **Roles and responsibilities**



ROLES	RESPONSIBILITIES
Apprentice	<p>As a minimum, the apprentice should:</p> <ul style="list-style-type: none"> <li>• participate in and complete on-programme training to meet the KSBs as outlined in the occupational standard for a minimum of 12 months</li> <li>• complete the required amount of off-the-job training specified by the apprenticeship funding rules and as arranged by the employer and training provider</li> <li>• understand the purpose and importance of EPA</li> <li>• meet the gateway requirements</li> <li>• undertake the EPA</li> </ul>
Employer	<p>As a minimum, the apprentice's employer must:</p> <ul style="list-style-type: none"> <li>• select the EPAO and training provider</li> <li>• work with the training provider (where applicable) to support the apprentice in the workplace and to provide the opportunities for the apprentice to develop the KSBs</li> <li>• arrange and support off-the-job training to be undertaken by the apprentice</li> <li>• decide when the apprentice is working at or above the occupational standard and is ready for EPA</li> <li>• ensure that supporting evidence required at the gateway is submitted in line with this EPA plan</li> <li>• liaise with the training provider and EPAO to ensure the EPA is booked in a timely manner</li> </ul> <p>Post-gateway, the employer must:</p> <ul style="list-style-type: none"> <li>• confirm arrangements with the EPAO for the EPA (who, when, where) in a timely manner (including providing access to any employer-specific documentation as required, for example company policies)</li> <li>• ensure that the EPA is scheduled with the EPAO for a date and time which allows the opportunity for the apprentice to be assessed against the KSBs</li> <li>• remain independent from the delivery of the EPA</li> <li>• ensure the apprentice is given sufficient time away from regular duties to prepare for, and complete all post-gateway elements of the EPA, and that any required supervision during this time (as stated within this EPA plan) is in place</li> </ul>

	<ul style="list-style-type: none"> <li>• where the apprentice is assessed in the workplace, ensure that the apprentice has access to the resources used on a regular basis</li> <li>• pass the certificate to the apprentice upon receipt from the EPAO</li> </ul>
EPAO	<p>As a minimum, the EPAO must:</p> <ul style="list-style-type: none"> <li>• conform to the requirements of this EPA plan and deliver its requirements in a timely manner</li> <li>• conform to the requirements of the register of end-point assessment organisations (RoEPAO)</li> <li>• conform to the requirements of the external quality assurance provider (EQAP) for this apprenticeship</li> <li>• understand the occupational standard</li> <li>• make the EPA contractual arrangements, including agreeing the price of the EPA</li> <li>• develop and produce assessment materials as detailed for each assessment method in this EPA plan</li> <li>• appoint qualified and competent independent assessors in line with the requirements of this EPA plan to conduct assessments and oversee their working</li> <li>• appoint administrators (and invigilators where required) to administer the EPA</li> <li>• provide training for independent assessors in terms of good assessment practice, operating the assessment tools and grading</li> <li>• provide information, advice, guidance and documentation to enable apprentices, employers and training providers to prepare for the EPA</li> <li>• confirm all gateway requirements have been met as quickly as possible</li> <li>• arrange for the EPA to take place, in consultation with the employer</li> <li>• ensure that the apprentice has access to the required resources and liaise with the employer to agree this if necessary, where the apprentice is not assessed in the workplace</li> <li>• develop and provide assessment recording documentation to ensure a clear and auditable process is in place for providing assessment decisions and feedback to stakeholders</li> </ul>

	<ul style="list-style-type: none"> <li>• have no direct connection with the apprentice, their employer or training provider in all instances; there must be no conflict of interest</li> <li>• have policies and procedures for internal quality assurance (IQA), and maintain records of IQA activity and moderation for external quality assurance (EQA) purposes</li> <li>• deliver induction training for independent assessors, and for invigilators and markers (where used)</li> <li>• undertake standardisation activity on this apprenticeship for an independent assessor before they conduct an EPA for the first time, if the EPA is updated and periodically (a minimum of annually)</li> <li>• manage invigilation of the apprentice to maintain security of the assessment in line with the EPAO's malpractice policy</li> <li>• verify the identity of the apprentice</li> <li>• use language in the development and delivery of the EPA that is appropriate to the level of the occupational standard</li> </ul>
Independent assessor	<p>As a minimum, an independent assessor must:</p> <ul style="list-style-type: none"> <li>• have the competence to assess the apprentice at the level of this apprenticeship and hold any required qualifications and experience in line with the requirements of the independent assessor as detailed in the IQA section of this EPA plan</li> <li>• understand the occupational standard and the requirements of this EPA</li> <li>• have, maintain and be able to evidence, up-to-date knowledge and expertise of the occupation</li> <li>• deliver the end-point assessment in-line with this EPA plan</li> <li>• comply with the IQA requirements of the EPAO</li> <li>• have no direct connection or conflict of interest with the apprentice, their employer or training provider; in all instances; there must be no conflict of interest</li> <li>• attend induction training</li> <li>• attend standardisation events when they start working for the EPAO, before they conduct an EPA for the first time and a minimum of annually for this apprenticeship</li> <li>• assess each assessment method, as determined by the EPA plan</li> <li>• assess the KSBs assigned to each assessment method, as shown in the mapping of KSBs to assessment methods in this EPA plan</li> </ul>

	<ul style="list-style-type: none"> <li>• make the grading decisions</li> <li>• record and report assessment outcome decisions, for each apprentice, following instructions and using assessment recording documentation provided by the EPAO, in a timely manner</li> <li>• use language in the development and delivery of the EPA that is appropriate to the level of the occupational standard</li> <li>• mark open (constructed) test answers accurately according to the EPAO's mark scheme and procedures</li> </ul>
Training provider	<p>As a minimum, the training provider must:</p> <ul style="list-style-type: none"> <li>• work with the employer and support the apprentice during the off-the-job training to provide the opportunities to develop the KSBs as listed in the occupational standard</li> <li>• conduct training covering the KSBs agreed as part of the Commitment Statement or the Individual Learning Plan</li> <li>• monitor the apprentice's progress during any training provider led on-programme learning</li> <li>• advise the employer, upon request, on the apprentice's readiness for EPA</li> <li>• remain independent from the delivery of the EPA</li> </ul>
Marker	<p>As a minimum, the marker must:</p> <ul style="list-style-type: none"> <li>• attend induction training as directed by the EPAO</li> <li>• have no direct connection or conflict of interest with the apprentice, their employer or training provider in all instances</li> <li>• mark test answers in line with the EPAO's mark scheme and procedures</li> </ul>
Invigilator	<p>As a minimum, the invigilator must:</p> <ul style="list-style-type: none"> <li>• attend induction training as directed by the EPAO</li> <li>• have no direct connection or conflict of interest with the apprentice, their employer or training provider in all instances</li> <li>• invigilate and supervise apprentices during tests and in breaks during assessment methods to prevent malpractice in accordance with the EPAO's invigilation procedures</li> </ul>

## Reasonable adjustments

The EPAO must have reasonable adjustments arrangements for the EPA.

This should include:

- how an apprentice qualifies for reasonable adjustment
- what reasonable adjustments may be made

Adjustments must maintain the validity, reliability and integrity of the EPA as outlined in this EPA plan.

## Internal quality assurance (IQA)

Internal quality assurance refers to how the EPAO ensures valid, consistent and reliable EPA decisions. The EPAO must adhere to the requirements within the roles and responsibilities section:

The EPAO must also:

- have quality assurance systems and procedures that ensure fair, reliable and consistent EPA regardless of employer, place, time or independent assessor
- appoint independent assessors who are competent to deliver the EPA and who:
  - have recent relevant experience of the occupation or sector to at least occupational level 3 gained in the last 3 years or significant experience of the occupation or sector
- operate induction training for anyone involved in the delivery or assessment of the EPA
- provide training for independent assessors in good assessment practice, operating the assessment tools and making grading decisions
- provide ongoing training for markers and invigilators
- provide standardisation activity for this apprenticeship standard for all independent assessors:
  - before they conduct an EPA for the first time
  - if the EPA is updated
  - periodically as appropriate (a minimum of annually)
- conduct effective moderation of EPA decisions and grades
- conduct appeals where required, according to the EPAO's appeals procedure, reviewing and making final decisions on EPA decisions and grades
- have no direct connection with the apprentice, their employer or training provider

## Value for money

Affordability of the EPA will be aided by using at least some of the following:

- completing applicable assessment methods online (for example computer-based assessment)
- utilising digital remote platforms to conduct applicable assessment methods
- assessing multiple apprentices simultaneously where the method of assessment permits this
- using the employer's premises

- conducting assessment methods on the same day

## Professional recognition

This apprenticeship aligns with:

The Institute of Water for Registered Environmental Technician (REnvTech). The experience gained and responsibility held by the apprentice on completion of the apprenticeship will either wholly or partially satisfy the requirements for registration at this level.

The Institute of Water for Engineering Technician (EngTech). The experience gained and responsibility held by the apprentice on completion of the apprenticeship will either wholly or partially satisfy the requirements for registration at this level.

The Science Council for Registered Science Technician (RSciTech). Upon successful completion of the apprenticeship and upon receipt of the apprenticeship certificate, individuals are eligible to apply for RSciTech through a shortened application route. Individuals also need to be a member of a professional body that is licensed by the Science Council to be awarded this status. Further information is on the Science Council's website.

## Mapping of KSBs to assessment methods

KNOWLEDGE	ASSESSMENT METHODS
<p><b>K1:</b> Core. Overview of water and wastewater industries. Regulators and stakeholders: Drinking Water Inspectorate (DWI), Water Services Regulation Authority (OFWAT), Consumer Council for Water (CCWater), Environment Agency (EA), and Health, Safety Executive (HSE), and Department for Environment, Food and Rural Affairs (Defra) - roles and powers.</p>	Multiple-choice test
<p><b>K2:</b> Core. Technician's role. Limits of autonomy. Different teams and functions involved in operations: how they work together.</p>	Interview underpinned by a portfolio of evidence
<p><b>K3:</b> Core. Business operation considerations: how activities may impact customers, financial constraints, ethical business practices. Customer Experience Measure (CMEX). Regulatory and legislative performance measures.</p>	Interview underpinned by a portfolio of evidence
<p><b>K4:</b> Core. Water and wastewater science. Liquids, gases, and solid states commonly found in water industry. Elements, molecules, compounds, and ions. The pH scale, acids, and alkalinity. Physical, chemical, and biological process definition. Dissolved oxygen in treatment and processes.</p>	Multiple-choice test
<p><b>K5:</b> Core. Maths commonly used in the water and wastewater industries. S.I units. Calculations. Standard form. Measurement of distance, area, volume and flow, and unit conversion. Simple transposition of formula. Routine flow and hydraulics theories, principles, and calculations.</p>	Multiple-choice test
<p><b>K6:</b> Core. Planned preventative maintenance of monitoring equipment requirements. Asset health check requirements.</p>	Interview underpinned by a portfolio of evidence
<p><b>K7:</b> Core. Energy performance monitoring methods. Energy consumption reduction guidelines. Triad arrangements.</p>	Multiple-choice test
<p><b>K8:</b> Core. Isolation, shutdown, and recommissioning of process streams requirements and procedures.</p>	Interview underpinned by a portfolio of evidence



<p><b>K9:</b> Core. Process control systems. Types of equipment used for process control operations and the functions they perform, set-points, and alarm values.</p>	Observation with questions
<p><b>K10:</b> Core. Operational and quality procedures. Escalation procedures. What they are and how to use them.</p>	Observation with questions
<p><b>K11:</b> Core. Different types of incidents and emergency situations (internal and external): pollution, loss of process, security, weather, and accidents: their potential impact. Incident management and procedures.</p>	Interview underpinned by a portfolio of evidence
<p><b>K12:</b> Core. Chemical awareness. Transport, acceptance and use of chemicals. Agreement of Dangerous Goods transported by Road regulation (ADR). Chemical delivery requirements. Chemical control methods.</p>	Multiple-choice test
<p><b>K13:</b> Core. Optimisation in the treatment process: what it means and how it can be achieved.</p>	Interview underpinned by a portfolio of evidence
<p><b>K14:</b> Core. Asset optimisation and performance: quality, cost, time, safety, and impact.</p>	Interview underpinned by a portfolio of evidence
<p><b>K15:</b> Core. Fault finding and problem-solving techniques: root cause analysis and diagnostics.</p>	Interview underpinned by a portfolio of evidence
<p><b>K16:</b> Core. Health and Safety at Work Act – responsibilities. Management of health and safety at work regulations. Control of Substances Hazardous to Health (CoSHH). Risks and hazards. Risk assessments and controlling risk. Control methods for harmful substances and chemicals, effluents, and sludge. Health and safety signage. Personal Protective Equipment (PPE). Working in confined spaces: safety equipment and lifting equipment. Harnesses, gas detectors and respiratory apparatus. Manual handling. The Reporting of Injuries, Diseases and Dangerous Occurrences Regulations (RIDDOR). Asbestos awareness. Lone working. Working at height. Working time directive. First aid. Emergency procedures. Drug and alcohol awareness. Permits to</p>	Multiple-choice test

<p>work. Storage of tools, equipment, and materials. ATEX compliance (safety requirements of the workplace and equipment used in explosive atmosphere). Dangerous Substances and Explosive Atmospheres Regulations (DSEAR). Pressure System Safety Regulations (PSSR). Provision of Work Equipment Regulations (PUWER). Lifting Operations and Lifting Equipment Regulations (LOLER). Safe isolation of plant and equipment (lockout, tagout).</p>	
<p><b>K17:</b> Core. Environment and sustainability. Environmental Protection Act. Types of pollution and control measures. Environmental permitting and discharge consents. Operator Self Monitoring (OSM): sampling requirements. Monitoring emissions to air, land, and water (MCERTS). Principles of sustainable development. Waste management and waste streams. Invasive species and Duty of Care in the Environmental aspect.</p>	Multiple-choice test
<p><b>K18:</b> Core. Information and digital technology: email, word processing, spreadsheets, presentation, remote working platforms, work and asset management systems. General Data Protection Regulation (GDPR). Cyber security.</p>	Interview underpinned by a portfolio of evidence
<p><b>K19:</b> Core. Documentation requirements for example maintenance records, asset check records.</p>	Observation with questions
<p><b>K20:</b> Core. Planning, prioritising, work scheduling, and time management techniques.</p>	Interview underpinned by a portfolio of evidence
<p><b>K21:</b> Core. Communication techniques: verbal, written and electronic. Adapting style to audience.</p>	Observation with questions
<p><b>K22:</b> Core. Team working and culture. How to work as part of a team, the importance of establishing and meeting the requirements of different roles. Negotiation and conflict management techniques.</p>	Interview underpinned by a portfolio of evidence
<p><b>K23:</b> Core. Equality, diversity, and inclusion in the workplace.</p>	Interview underpinned by a portfolio of evidence
<p><b>K24:</b> Water treatment process technician.</p>	Multiple-choice test

Water Supply (Water Quality) Regulations. Consequences of non-compliance.	
<b>K25:</b> Water treatment process technician. National water hygiene: importance of water, water as a carrier of disease, potential contamination and its consequences and preventing contamination.	Multiple-choice test
<b>K26:</b> Water treatment process technician. Water quality requirements. Drinking water safety plans. Water quality parameters and the role of water quality alarms. Water quality incident investigation requirements. Water quality records. Consequences of failure.	Multiple-choice test
<b>K27:</b> Water treatment process technician. DWI asset and site security requirements: water storage alarms.	Multiple-choice test
<b>K28:</b> Water treatment process technician. Water quality monitoring, sampling, and testing requirements and techniques. Equipment, resources, and materials used. Sampling points.	Observation with questions
<b>K29:</b> Water treatment process technician. Raw water and catchment management permitting and protection.	Interview underpinned by a portfolio of evidence
<b>K30:</b> Water treatment process technician. Treatment processes: abstraction, clarification, coagulation, disinfection, and filtration. Water works design flows - impact of flow change on treatment process. Hydraulics principles. Objectives, parameters, variables, optimal performance measures (quality, cost, and waste) and the consequences of sub-optimal performance. Waste stream processes.	Observation with questions
<b>K31:</b> Water treatment process technician. Plant shutdown and re-start procedures: planned and reactive. Impact and causes of shutdown.	Multiple-choice test
<b>K32:</b> Water treatment process technician. Distribution system protection: disinfection, chemical treatment, flow, and valve operation controls.	Multiple-choice test
<b>K33:</b> Water treatment process technician. Treated water storage point objectives and requirements.	Multiple-choice test

<p><b>K34:</b> Wastewater treatment process technician. Treatment processes: preliminary treatment, primary treatment, secondary treatment, tertiary treatment, sludge treatment, and odour management. Wastewater works design flows - impact of flow change on treatment process.</p>	Observation with questions
<p><b>K35:</b> Wastewater treatment process technician. Wastewater compliance and performance monitoring requirements: wastewater quality standards, sampling, analysis, and reporting.</p>	Observation with questions
<p><b>K36:</b> Wastewater treatment process technician. Nature and sources of wastewater effluent and its impact on the environment.</p>	Multiple-choice test
<p><b>K37:</b> Wastewater treatment process technician. Chemical, biological, microbiological, and physical characteristics of wastewater effluent and trade effluents.</p>	Multiple-choice test
<p><b>K38:</b> Wastewater treatment process technician. Risks of working on wastewater treatment site – personal hygiene risks and requirements.</p>	Observation with questions
<p><b>K39:</b> Wastewater treatment process technician. Configuration, operation, and performance requirements of types of sewerage systems and pumping stations: inter-stage pumping stations, detention tanks, combined sewer overflow screens (CSO). Pumps and associated ancillary equipment used.</p>	Multiple-choice test
<p><b>K40:</b> Wastewater treatment process technician. Purpose, application, and impact of wastewater flows: volumes, permits, catchment area consent, and impact of weather conditions.</p>	Interview underpinned by a portfolio of evidence

SKILL	ASSESSMENT METHODS
<b>S1:</b> Core. Comply with (water or waste waste) industry regulations and procedures.	Observation with questions
<b>S2:</b> Core. Follow alarm intervention procedures. Resolve alarm issues.	Interview underpinned by a portfolio of evidence
<b>S3:</b> Core. Inspect (planned) and check assets (reactive) and identify action.	Interview underpinned by a portfolio of evidence
<b>S4:</b> Core. Follow procedures to remove assets for routine maintenance and recommission.	Interview underpinned by a portfolio of evidence
<b>S5:</b> Core. Carry out validation or instrument checks of online equipment and identify action.	Interview underpinned by a portfolio of evidence
<b>S6:</b> Core. Monitor first line maintenance of process control equipment and instrumentation.	Interview underpinned by a portfolio of evidence
<b>S7:</b> Core. Identify issues. Apply fault-finding and problem-solving techniques: identify root cause. Resolve faults.	Interview underpinned by a portfolio of evidence
<b>S8:</b> Core. Consider, identify, and promote areas for improvement for example, in relation to quality, cost, time, safety, and impact.	Interview underpinned by a portfolio of evidence
<b>S9:</b> Core. Interrogate and interpret electronic control systems. For example, HMI or SCADA.	Observation with questions
<b>S10:</b> Core. Use data monitoring and control systems to monitor and control equipment.	Observation with questions
<b>S11:</b> Core. Inspect and check safety equipment: identify and take action.	Observation with questions
<b>S12:</b> Core.	Interview underpinned

Identify and instigate incident escalation procedures.	by a portfolio of evidence
<b>S13:</b> Core. Apply site standards for housekeeping.	Observation with questions
<b>S14:</b> Core. Conduct risk assessments: identify and document risks and hazards in the workplace. Apply control measures.	Observation with questions
<b>S15:</b> Core. Comply with health and safety regulations and safe working practices and procedures.	Observation with questions
<b>S16:</b> Core. Follow site security procedures.	Observation with questions
<b>S17:</b> Core. Follow procedures for emergency situations.	Interview underpinned by a portfolio of evidence
<b>S18:</b> Core. Comply with environmental and sustainability regulations and requirements. For example, safe disposal of waste, re-cycling or re-use of materials, and efficient use of resources.	Interview underpinned by a portfolio of evidence
<b>S19:</b> Core. Apply principles of sustainable development. For example, in choice of materials.	Interview underpinned by a portfolio of evidence
<b>S20:</b> Core. Conduct and assess impact of activity for example, environmental, cost, reputation, safety, and health. Apply control measures.	Interview underpinned by a portfolio of evidence
<b>S21:</b> Core. Identify and escalate issues.	Interview underpinned by a portfolio of evidence
<b>S22:</b> Core. Read and interpret written information. For example, work instructions, and service level agreements.	Observation with questions
<b>S23:</b> Core. Complete work records.	Observation with questions

<p><b>S24:</b> Core. Use information technology. Follow cyber security procedures. Comply with GDPR.</p>	Interview underpinned by a portfolio of evidence
<p><b>S25:</b> Core. Plan tasks. Identify and organise resources to complete work tasks.</p>	Interview underpinned by a portfolio of evidence
<p><b>S26:</b> Core. Communicate verbally and in writing. For example, with colleagues, stakeholders, or others. Use water industry terminology where appropriate.</p>	Observation with questions
<p><b>S27:</b> Core. Liaise with, negotiate with, and handle conflict in individual or group environments.</p>	Interview underpinned by a portfolio of evidence
<p><b>S28:</b> Water treatment process technician. Select raw water source or blend of sources.</p>	Interview underpinned by a portfolio of evidence
<p><b>S29:</b> Water treatment process technician. Monitor and control water abstraction.</p>	Interview underpinned by a portfolio of evidence
<p><b>S30:</b> Water treatment process technician. Monitor and control water chemical dosing procedures.</p>	Observation with questions
<p><b>S31:</b> Water treatment process technician. Operate water process control equipment and instrumentation.</p>	Observation with questions
<p><b>S32:</b> Water treatment process technician. Take water samples.</p>	Observation with questions
<p><b>S33:</b> Water treatment process technician. Analyse and interpret on-site laboratory data and check against water process parameters.</p>	Observation with questions
<p><b>S34:</b> Water treatment process technician. Monitor and control water treatment processes and performance.</p>	Observation with questions
<p><b>S35:</b> Water treatment process technician. Monitor and control the effectiveness of disinfection.</p>	Observation with questions



<b>S36:</b> Water treatment process technician. Monitor and control waste stream processes and performance.	Interview underpinned by a portfolio of evidence
<b>S37:</b> Water treatment process technician. Apply procedures to shut-down, isolate, and re-commission water process streams.	Interview underpinned by a portfolio of evidence
<b>S38:</b> Wastewater treatment process technician. Monitor and control incoming flows.	Interview underpinned by a portfolio of evidence
<b>S39:</b> Wastewater treatment process technician. Control internal pumping station operations.	Interview underpinned by a portfolio of evidence
<b>S40:</b> Wastewater treatment process technician. Operate wastewater process control equipment and instrumentation.	Observation with questions
<b>S41:</b> Wastewater treatment process technician. Take wastewater samples.	Observation with questions
<b>S42:</b> Wastewater treatment process technician. Analyse and interpret on-site testing data and monitoring equipment data and check against wastewater process parameters.	Observation with questions
<b>S43:</b> Wastewater treatment process technician. Monitor and maintain grit removal and screening assets.	Observation with questions
<b>S44:</b> Wastewater treatment process technician. Monitor and control the performance of sedimentation, biological and chemical treatment operations.	Observation with questions
<b>S45:</b> Wastewater treatment process technician. Monitor and control wastewater treatment processes and performance.	Observation with questions
<b>S46:</b> Wastewater treatment process technician. Apply procedures to shut-down, isolate and re-commission wastewater process streams.	Interview underpinned by a portfolio of evidence
<b>S47:</b> Wastewater treatment process technician. Follow wastewater hygiene personal procedures.	Observation with questions

BEHAVIOUR	ASSESSMENT METHODS
<b>B1:</b> Core. Prioritise and promote public health, workplace health and safety, and security.	Observation with questions
<b>B2:</b> Core. Prioritise and promote the environment and sustainability.	Interview underpinned by a portfolio of evidence
<b>B3:</b> Core. Apply a professional approach.	Observation with questions
<b>B4:</b> Core. Take ownership for work and responsibility for the quality of work and impact on others.	Observation with questions
<b>B5:</b> Core. Team-focus to meet work goals: support others.	Interview underpinned by a portfolio of evidence
<b>B6:</b> Core. Respond and adapt to work demands.	Interview underpinned by a portfolio of evidence
<b>B7:</b> Core. Committed to continued professional development to maintain and enhance competence in own area of practice.	Interview underpinned by a portfolio of evidence

## Mapping of KSBs to grade themes

### Observation with questions - Observation

KSBS GROUPED BY THEME	KNOWLEDGE	SKILLS	BEHAVIOUR
(Core) Work preparation S22	N/A	Read and interpret written information. For example, work instructions, and service level agreements. (S22)	N/A
(Core) Work environment S13 S14 S15 S16 B1	N/A	Apply site standards for housekeeping. (S13)  Conduct risk assessments: identify and document risks and hazards in the workplace. Apply control measures. (S14)  Comply with health and safety regulations and safe working practices and procedures. (S15)  Follow site security procedures. (S16)	Prioritise and promote public health, workplace health and safety, and security. (B1)
(Core) Safety equipment S11	N/A	Inspect and check safety equipment: identify and take action. (S11)	N/A
(Core) Communication K21 S26 B3	Communication techniques: verbal, written and electronic. Adapting style to audience. (K21)	Communicate verbally and in writing. For example, with colleagues, stakeholders, or others. Use water industry terminology where appropriate. (S26)	Apply a professional approach. (B3)
(Core)	Documentation	Complete work	N/A

Documentation K19 S23	requirements for example maintenance records, asset check records. (K19)	records. (S23)	
(Water treatment process technician) Water treatment and process standards K9 K10 K30 S1 S9 S10 S30 S31 S34 S35 B4	<p>Process control systems. Types of equipment used for process control operations and the functions they perform, set-points, and alarm values. (K9)</p> <p>Operational and quality procedures. Escalation procedures. What they are and how to use them. (K10)</p> <p>Treatment processes: abstraction, clarification, coagulation, disinfection, and filtration. Water works design flows - impact of flow change on treatment process. Hydraulics principles. Objectives, parameters, variables, optimal performance measures (quality, cost, and waste) and the consequences of sub-optimal performance. Waste stream processes. (K30)</p>	<p>Comply with (water or waste waste) industry regulations and procedures. (S1)</p> <p>Interrogate and interpret electronic control systems. For example, HMI or SCADA. (S9)</p> <p>Use data monitoring and control systems to monitor and control equipment. (S10)</p> <p>Monitor and control water chemical dosing procedures. (S30)</p> <p>Operate water process control equipment and instrumentation. (S31)</p> <p>Monitor and control water treatment processes and performance. (S34)</p> <p>Monitor and control the effectiveness of disinfection. (S35)</p>	<p>Take ownership for work and responsibility for the quality of work and impact on others. (B4)</p>
(Water treatment process technician)	Water quality monitoring,	Take water samples. (S32)	N/A

<p>Water sampling and analysis K28 S32 S33</p>	<p>sampling, and testing requirements and techniques. Equipment, resources, and materials used. Sampling points. (K28)</p>	<p>Analyse and interpret on-site laboratory data and check against water process parameters. (S33)</p>	
<p>(Wastewater treatment process technician) Wastewater treatment and process standards K34 S40 S43 S44 S45</p>	<p>Treatment processes: preliminary treatment, primary treatment, secondary treatment, tertiary treatment, sludge treatment, and odour management. Wastewater works design flows - impact of flow change on treatment process. (K34)</p>	<p>Operate wastewater process control equipment and instrumentation. (S40)</p> <p>Monitor and maintain grit removal and screening assets. (S43)</p> <p>Monitor and control the performance of sedimentation, biological and chemical treatment operations. (S44)</p> <p>Monitor and control wastewater treatment processes and performance. (S45)</p>	<p>N/A</p>
<p>(Wastewater treatment process technician) Wastewater monitoring and sampling and analysis K35 S41 S42</p>	<p>Wastewater compliance and performance monitoring requirements: wastewater quality standards, sampling, analysis, and reporting. (K35)</p>	<p>Take wastewater samples. (S41)</p> <p>Analyse and interpret on-site testing data and monitoring equipment data and check against wastewater process parameters. (S42)</p>	<p>N/A</p>
<p>(Wastewater treatment process technician) Risks of</p>	<p>Risks of working on wastewater treatment site –</p>	<p>Follow wastewater hygiene personal procedures. (S47)</p>	<p>N/A</p>

working in wastewater K38 S47	personal hygiene risks and requirements. (K38)		
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## Interview underpinned by a portfolio of evidence - Discussion

KSBS GROUPED BY THEME	KNOWLEDGE	SKILLS	BEHAVIOUR
(Core) Working in the water industry K2 K3 S21	<p>Technician's role. Limits of autonomy. Different teams and functions involved in operations: how they work together. (K2)</p> <p>Business operation considerations: how activities may impact customers, financial constraints, ethical business practices. Customer Experience Measure (CMEX). Regulatory and legislative performance measures. (K3)</p>	Identify and escalate issues. (S21)	N/A
(Core) Environmental and sustainability  S18 S19 B2	N/A	<p>Comply with environmental and sustainability regulations and requirements. For example, safe disposal of waste, recycling or re-use of materials, and efficient use of resources. (S18)</p> <p>Apply principles of sustainable development. For example, in choice of materials. (S19)</p>	Prioritise and promote the environment and sustainability. (B2)
(Core) Asset and equipment maintenance K6 S3 S4 S5 S6	Planned preventative maintenance of monitoring equipment requirements. Asset health check requirements. (K6)	<p>Inspect (planned) and check assets (reactive) and identify action. (S3)</p> <p>Follow procedures to remove assets for routine maintenance</p>	N/A

		<p>and recommission. (S4)</p> <p>Carry out validation or instrument checks of online equipment and identify action. (S5)</p> <p>Monitor first line maintenance of process control equipment and instrumentation. (S6)</p>	
<p>(Core) Improvement and optimisation K13 S8</p>	<p>Optimisation in the treatment process: what it means and how it can be achieved. (K13)</p>	<p>Consider, identify, and promote areas for improvement for example, in relation to quality, cost, time, safety, and impact. (S8)</p>	N/A
<p>(Core) Responding to alarms  S2</p>	N/A	<p>Follow alarm intervention procedures. Resolve alarm issues. (S2)</p>	N/A
<p>(Core) Resolving faults K15 S7</p>	<p>Fault finding and problem-solving techniques: root cause analysis and diagnostics. (K15)</p>	<p>Identify issues. Apply fault-finding and problem-solving techniques: identify root cause. Resolve faults. (S7)</p>	N/A
<p>(Core) Responding to incidents K11 S12 S17 S20</p>	<p>Different types of incidents and emergency situations (internal and external): pollution, loss of process, security, weather, and accidents: their potential impact. Incident management and procedures. (K11)</p>	<p>Identify and instigate incident escalation procedures. (S12)</p> <p>Follow procedures for emergency situations. (S17)</p> <p>Conduct and assess impact of activity for example, environmental, cost, reputation, safety, and health. Apply</p>	N/A



		control measures. (S20)	
(Core) Team working K20 K22 K23 S25 S27 B5 B6 B7	<p>Planning, prioritising, work scheduling, and time management techniques. (K20)</p> <p>Team working and culture. How to work as part of a team, the importance of establishing and meeting the requirements of different roles. Negotiation and conflict management techniques. (K22)</p> <p>Equality, diversity, and inclusion in the workplace. (K23)</p>	<p>Plan tasks. Identify and organise resources to complete work tasks. (S25)</p> <p>Liaise with, negotiate with, and handle conflict in individual or group environments. (S27)</p>	<p>Team-focus to meet work goals: support others. (B5)</p> <p>Respond and adapt to work demands. (B6)</p> <p>Committed to continued professional development to maintain and enhance competence in own area of practice. (B7)</p>
(Core) Information technology K18 S24	Information and digital technology: email, word processing, spreadsheets, presentation, remote working platforms, work and asset management systems. General Data Protection Regulation (GDPR). Cyber security. (K18)	Use information technology. Follow cyber security procedures. Comply with GDPR. (S24)	N/A
(Water treatment process technician) Water catchment and abstraction K29 S28 S29	Raw water and catchment management permitting and protection. (K29)	<p>Select raw water source or blend of sources. (S28)</p> <p>Monitor and control water abstraction. (S29)</p>	N/A
(Water treatment	N/A	Monitor and control	N/A

process technician) Waste streams management  S36		waste stream processes and performance. (S36)	
(Water treatment process technician) Shut down, isolation and recommission of water process streams K8 K14 S37	Isolation, shutdown, and recommissioning of process streams requirements and procedures. (K8)  Asset optimisation and performance: quality, cost, time, safety, and impact. (K14)	Apply procedures to shut-down, isolate, and re-commission water process streams. (S37)	N/A
(Wastewater treatment process technician) Pumping operations  S39	N/A	Control internal pumping station operations. (S39)	N/A
(Wastewater treatment process technician) Wastewater flows K40 S38	Purpose, application, and impact of wastewater flows: volumes, permits, catchment area consent, and impact of weather conditions. (K40)	Monitor and control incoming flows. (S38)	N/A
(Wastewater treatment process technician) Shut down, isolation and recommission of wastewater process streams  S46	N/A	Apply procedures to shut-down, isolate and re-commission wastewater process streams. (S46)	N/A

## Version log

Version	Change detail	Earliest start date	Latest start date	Latest end date
1.0	Approved for delivery	13/09/2022	Not set	Not set

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