



Scheme Description

Water Microbiology (QWAS) Proficiency Testing Scheme

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RECORD OF ISSUE STATUS AND MODIFICATIONS

Issue	Issue Date	Details	Authorised by
25	Feb 2024	Ranges increased for 412, 414 and 420 cfu/vial to reflect sample preparation process.	T.Ashcroft
26	Feb 2024	Reporting units updates for WT431	T.Ashcroft
27	Apr 2024	Updated all ranges to match with reporting units	A.S.Eden
28	July 2024	General format of document updated. Removed references to Appendix A. New sample 432-436 New Enterobacteriaceae analyte to 416 New Legionella identification to 423 New endoscope water sample New Detection of Salmonella in waters (all) sample New Pseudomonas/coliforms/E.coli/enterococci sample in wastewater etc Two different coliphages samples Group samples by matrix type	N. Mason T.Noblett
29	Oct 2024	Updated units for WT-431 to PFU/100ml Updated units for WT 433 to cfu/100ml Corrected WT-427 SDPA to log ₁₀ 0.05	T. Ashcroft
30	Jan 2025	Updated units for ranges WT-433, WT-434, WT-435, WT-436 Updated 'Supplied as' WT 433, WT-434 Updated reporting units for WT-436 to PFU/ml	T. Ashcroft
31	Feb 2025	Updated reporting units for WT-435 to cfu/100ml. Updated range to 0 – 100,000 WT-423 Identification analyte changed to 'Legionella species'	T.Ashcroft
32	July 2025	Changed ranges of WT-412 TVC analytes to 0 – 500 cfu/ml Escherichia coli and Enterobacteriaceae analytes removed from WT-416 and added to WT-432. WT-416 Supplied as updated to 1 x 10g simulated sludge sample. WT-416 <i>Salmonella</i> range decreased to 0 – 1,000	T.Ashcroft
33	May 2026	New UKAS logo added	A Collins
34	June 2026	New Aeromonas sample added	A Cheetham
35	July 2026	'Coliforms' changed to 'Total Coliforms' for samples WT-412 and WT-425 Yeast and Mould Identification added to WT-413 New Vibrio sample added WT-438 New Burkholderia in pharmaceutical water added WT-439 New Enterobacteriaceae in water added WT-440	T.Ashcroft

Notes: Where this document has been translated, the English version shall remain the definitive version

SCHEME INFORMATION

Scheme Aims and Organisation

The primary aim of the Quality in Water Analysis Proficiency Testing Scheme (QWAS) is to enable laboratories performing the microbiological analysis of water to monitor their performance and compare it with that of their peers. QWAS also aims to provide information to participants on technical issues and methodologies relating to microbiological testing of water and related materials.

The QWAS scheme year operates from January to December. Further information about QWAS, including test material availability, round despatch dates and reporting deadlines, are available on the current QWAS application form.

Test Materials

Details of test materials available in QWAS are given in the 'Samples Available' section. The test parameters are continually reviewed to ensure they meet the needs of current laboratory testing and regulatory requirements.

Test material batches are tested for homogeneity for at least one test parameter where deemed appropriate. Details of homogeneity tests performed and results are given in the QWAS Scheme Reports.

Some aspects of the scheme, such as test material production, homogeneity testing and stability assessment, can from time to time be subcontracted. When subcontracting occurs, it is placed with a competent subcontractor and LGC is responsible for this work. The planning of the scheme, the evaluation of performance and the authorisation of the final report will never be subcontracted.

Statistical Analysis

Information on the statistics used in QWAS can be found in the General Protocol and in the Scheme Report. Methods for determining assigned values and the values for SDPA used for individual samples are given in the 'Samples Available' section.

Methods

Methods are listed PORTAL. Please select the most appropriate method from the list. If none of the methods are appropriate, then please report your method as 'Other' and record a brief description in the Comments Section in PORTAL.

Results and Reports

QWAS results are returned through our electronic reporting software, PORTAL, full instructions for which are provided by email.

QWAS reports will be available on the website within 10 working days of round closure. Participants will be emailed a link to the report when it is available.

DESCRIPTION OF ABBREVIATIONS USED

Assigned Value (AV)

The assigned value may be derived in the following ways:

- From the robust mean (median) of participant results (RMean). This is the median of participant results after the removal of test results that are inappropriate for statistical evaluation, e.g. miscalculations, transpositions and other gross errors. Generally, the assigned value will be set using results from all methods, unless the measurement is considered method-dependant, in which case the assigned value will be set by method and indicated in the report tables. For some analytes, where there is a recognised reference method for that type of measurement, this may be used as the assigned value for a particular analyte i.e. it would be applied to results obtained by any method.

Traceability: Assigned values which are derived from the participant results, or a sub-set of the results are not traceable to an international measurement standard. The uncertainty of assigned values derived in this way is estimated from the participant results, according to ISO 13528.

- From a formulation value (Form). This denotes the use of an assigned value derived from sample preparation details, where known and exact quantities of analyte have been used to prepare the sample.

Traceability: Assigned values calculated from the formulation of the test sample are traceable, via an unbroken metrological traceability chain, to an international measurement standard. The measurement uncertainty of the assigned value is calculated using the contributions from each calibration in the traceability chain.

- From a qualitative formulation (Qual Form). This applies to qualitative tests where the assigned value is simply based on the presence/absence of the analyte in the test material.

Traceability: Assigned values calculated from the qualitative formulation of the test sample are traceable to a certified reference standard or a microbiological reference strain.

- From expert labs (Expert). The assigned value for the analyte is provided by an 'expert' laboratory.

Traceability: Assigned values provided by an 'expert' laboratory may be traceable to an international measurement standard, according to the laboratory and the method used. The uncertainty of measurement for an assigned value produced in this way will be provided by the laboratory undertaking the analysis. Details of traceability and the associated uncertainty will be provided in the report for the scheme/round.

Range

This indicates the concentration range at which the analyte may be present in the test material.

SDPA

The SDPA represents the 'standard deviation for proficiency assessment' which is used to assess participant performance for the measurement of each analyte. This may be a fixed value (as stated), a percentage (%) of the assigned value or based on the robust standard deviation of the participant measurement results, either across all methods or by method depending on whether the measurement made is method dependent (see assigned value).

Units

This indicates the units used for the assessment of data and in which participants should report their results. For some analytes in some schemes participants may have a choice of which units to report their results, however, the units stipulated in this scheme description are the default units to which any results reported using allowable alternative results will be converted to.

DP

This indicates the number of decimal places to which participants should report their measurement results.

SAMPLES AVAILABLE

Sample PT-WT-412

Indicator organisms in potable water

Supplied as:

10ml vial (to be reconstituted to final volume of 1 litre)

Analyte	Method	AV	Range	SDPA	Reporting units	DP
Total aerobic count @ 22°C	All	RMean	0 to 500	log ₁₀ 0.35	cfu/ml	0
Total aerobic count @ 37°C	All	RMean	0 to 500	log ₁₀ 0.35	cfu/ml	0
Enumeration of <i>Escherichia coli</i>	All	RMean	0 to 1,000	log ₁₀ 0.35	cfu/100ml	0
Enumeration of total coliforms	All	RMean	0 to 1,000	log ₁₀ 0.35	cfu/100ml	0
Enumeration of enterococci	All	RMean	0 to 1,000	log ₁₀ 0.35	cfu/100ml	0

Sample PT-WT-413

Environmental organisms in potable water

Supplied as:

10ml vial (to be reconstituted to final volume of 1 litre)

Analyte	Method	AV	Range	SDPA	Reporting units	DP
Enumeration of <i>Clostridium perfringens</i>	All	RMean	0 to 1,000	log ₁₀ 0.35	cfu/100ml	0
Enumeration of sulphite-reducing Clostridia	All	RMean	0 to 1,000	log ₁₀ 0.35	cfu/100ml	0
Detection of sulphite-reducing Clostridia	All	Qual Form	0 to 1,000	NA	Detected/Not Detected 100ml	NA
Enumeration of sulphite-reducing Clostridia spores ONLY	All	RMean	0 to 1,000	log ₁₀ 0.35	cfu/100ml	0
Enumeration of <i>Pseudomonas aeruginosa</i>	All	RMean	0 to 1,000	log ₁₀ 0.35	cfu/100ml	0
Enumeration of yeast	All	RMean	0 to 1,000	log ₁₀ 0.35	cfu/100ml	0
Enumeration of mould	All	RMean	0 to 1,000	log ₁₀ 0.35	cfu/100ml	0
Enumeration of yeast and mould	All	RMean	0 to 1,000	log ₁₀ 0.35	cfu/100ml	0
Identification of yeast and mould to genus and/or species level ‡	All	Qual Form	NA	NA	NA	NA

‡Accredited within the boundaries of LGC's flexible scope of UKAS accreditation

Sample PT-WT-414

Microorganisms in Process water

Supplied as:

10ml vial (to be reconstituted to final volume of 100 ml)

Analyte	Method	AV	Range	SDPA	Reporting units	DP
Total aerobic count	All	RMean	0 to 100,000	log ₁₀ 0.35	cfu/ml	0
Enumeration of <i>Pseudomonas</i> species	All	RMean	0 to 100,000	log ₁₀ 0.35	cfu/ml	0

Analyte	Method	AV	Range	SDPA	Reporting units	DP
Enumeration of <i>Pseudomonas aeruginosa</i>	All	RMean	0 to 100,000	log ₁₀ 0.35	cfu/ml	0
Enumeration of yeast	All	RMean	0 to 100,000	log ₁₀ 0.35	cfu/ml	0
Enumeration of mould	All	RMean	0 to 100,000	log ₁₀ 0.35	cfu/ml	0
Enumeration of yeast and mould	All	RMean	0 to 100,000	log ₁₀ 0.35	cfu/ml	0

Sample PT-WT-416

Detection of Salmonella in Effluent sludge

Supplied as:

10g simulated sludge sample

Analyte	Method	AV	Range	SDPA	Reporting units	DP
Detection of <i>Salmonella</i> species	All	Qual Form	0 to 1,000	NA	Detected/Not Detected 100ml	NA

Sample PT-WT-417

Legionella pneumophila in Industrial waters

Supplied as:

1 x 10ml vial (to be reconstituted to final volume of up to 10 x 1 litre)

Analyte	Method	AV	Range	SDPA	Reporting units	DP
Enumeration of <i>Legionella pneumophila</i> by culture (membrane filtration)	All	RMean	0 to 100,000	log ₁₀ 0.50	cfu/L	0
Enumeration of <i>Legionella pneumophila</i> by culture (direct count)	All	RMean	0 to 100,000	log ₁₀ 0.50	cfu/L	0
Detection of <i>Legionella pneumophila</i>	All	Qual Form	0 to 100,000	NA	Detected/Not Detected L	NA
Enumeration of <i>Legionella pneumophila</i> by PCR	PCR	RMean	All	log ₁₀ 0.50	genomic units/L	0
Identification of <i>Legionella pneumophila</i>	All	Qual Form	NA	NA	NA	NA

Sample PT-WT-418

Legionella species in Industrial waters

Supplied as:

1 x 10ml vial (to be reconstituted to final volume of up to 10 x 1 litre)

Analyte	Method	AV	Range	SDPA	Reporting units	DP
Enumeration of <i>Legionella</i> species by culture (membrane filtration)	All	RMean	0 to 100,000	log ₁₀ 0.50	cfu/L	0
Enumeration of <i>Legionella</i> species by culture (direct)	All	RMean	0 to 100,000	log ₁₀ 0.50	cfu/L	0

Analyte	Method	AV	Range	SDPA	Reporting units	DP
count)						
Detection of <i>Legionella</i> species	All	Qual Form	0 to 100,000	NA	Detected/Not Detected L	NA
Enumeration of <i>Legionella</i> species by PCR	PCR	RMean	All	log ₁₀ 0.50	genomic units/L	0
Identification of <i>Legionella</i> species	All	Qual Form	NA	NA	NA	NA

Sample PT-WT-419

Supplied as:

Microorganisms in Surface/Waste/Bathing waters

10ml vial (to be reconstituted to final volume of up to 10 x 1 litre)

Analyte	Method	AV	Range	SDPA	Reporting units	DP
Enumeration of total coliforms	All	RMean	0 to 100,000	log ₁₀ 0.35	cfu/100ml	0
Enumeration of faecal coliforms	All	RMean	0 to 100,000	log ₁₀ 0.35	cfu/100ml	0
Enumeration of <i>Escherichia coli</i>	All	RMean	0 to 100,000	log ₁₀ 0.35	cfu/100ml	0
Enumeration of enterococci	All	RMean	0 to 100,000	log ₁₀ 0.35	cfu/100ml	0
Detection of <i>Salmonella</i> species	All	Qual Form	0 to 10,000	NA	Detected/Not Detected/L	NA

Sample PT-WT-420

Supplied as:

Microorganisms in Mineral water

10ml vial (to be reconstituted to final volume of up to 10 x 1 litre)

Analyte	Method	AV	Range cfu/g	SDPA	Reporting units	DP
Total aerobic count @ 22°C	All	RMean	0 to 1,000	log ₁₀ 0.35	cfu/ml	0
Total aerobic count @ 37°C	All	RMean	0 to 1,000	log ₁₀ 0.35	cfu/ml	0
Enumeration of <i>Escherichia coli</i>	All	RMean	0 to 1,000	log ₁₀ 0.35	cfu/250ml	0
Enumeration of Enterococci	All	RMean	0 to 1,000	log ₁₀ 0.35	cfu/250ml	0
Enumeration of <i>Pseudomonas aeruginosa</i>	All	RMean	0 to 1,000	log ₁₀ 0.35	cfu/250ml	0

Sample PT-WT-421

Supplied as:

Microorganisms in Surface/Bathing/Recreational water

10ml vial (to be reconstituted to final volume of 1 litre)

Analyte	Method	AV	Range	SDPA	Reporting units	DP
Enumeration of coagulase-positive staphylococci	All	RMean	0 to 100,000	log ₁₀ 0.35	cfu/100ml	0
Enumeration of <i>Staphylococcus</i> species	All	RMean	0 to 100,000	log ₁₀ 0.35	cfu/100ml	0
Enumeration of sulphite-reducing clostridia	All	RMean	0 to 100,000	log ₁₀ 0.35	cfu/100ml	0

Analyte	Method	AV	Range	SDPA	Reporting units	DP
Enumeration of <i>Clostridium perfringens</i>	All	RMean	0 to 100,000	log ₁₀ 0.35	cfu/100ml	0
Total aerobic count	All	RMean	0 to 100,000	log ₁₀ 0.35	cfu/100ml	0

Sample PT-WT-422

Microorganisms in Sea Water

Supplied as:

10ml vial (to be reconstituted to final volume of up to 10 x 1 litre)

Analyte	Method	AV	Range	SDPA	Reporting units	DP
Enumeration of total coliforms	All	RMean	0 to 100,000	log ₁₀ 0.35	cfu/100ml	0
Enumeration of faecal coliforms	All	RMean	0 to 100,000	log ₁₀ 0.35	cfu/100ml	0
Enumeration of <i>Escherichia coli</i>	All	RMean	0 to 100,000	log ₁₀ 0.35	cfu/100ml	0
Enumeration of enterococci	All	RMean	0 to 100,000	log ₁₀ 0.35	cfu/100ml	0
Detection of <i>Salmonella</i> species	All	Qual Form	0 to 10,000	NA	Detected/Not Detected/L	NA

Sample PT-WT-423

Legionella in Potable Water

Supplied as:

10ml vial (to be reconstituted to final volume of 10 x 1 litre)

Analyte	Method	AV	Range	SDPA	Reporting units	DP
Detection of <i>Legionella</i> species at low levels	All	Qual Form	0 to 1,000	NA	Detected/Not Detected L	NA
Enumeration of <i>Legionella</i> species by culture	All	RMean	0 to 1,000	log ₁₀ 0.50	cfu/L	0
Identification of <i>Legionella</i> species	All	Qual Form	NA	NA	NA	NA

Sample PT-WT-424

Microorganisms in Mineral water (Presence/absence)

Supplied as:

10ml vial (to be reconstituted to final volume of 1 litre)

Analyte	Method	AV	Range	SDPA	Reporting units	DP
Detection of coagulase-positive staphylococci	All	Qual Form	0 to 1,000	NA	Detected/Not Detected 250ml	NA
Detection of sulphite-reducing Clostridia	All	Qual Form	0 to 1,000	NA	Detected/Not Detected 50ml	NA
Detection of sulphite-reducing Clostridia spores ONLY	All	Qual Form	0 to 1,000	NA	Detected/Not Detected 50ml	NA

Sample PT-WT-425

Supplied as:

Indicator organisms in potable water (Presence/absence)

10ml vial (to be reconstituted to a final volume of 1 litre)

Analyte	Method	AV	Range	SDPA	Reporting units	DP
Detection of <i>Escherichia coli</i>	All	Qual Form	0 to 1,000	NA	Detected/Not Detected 100ml	NA
Detection of total coliforms	All	Qual Form	0 to 1,000	NA	Detected/Not Detected 100ml	NA
Detection of enterococci	All	Qual Form	0 to 1,000	NA	Detected/Not Detected 100ml	NA

Sample PT-WT-426

Supplied as:

Identification Test (non-pathogen)

Participants will be provided with a vial of freeze-dried material containing a single organism which will need to be cultured on non-selective agar before test. The sample may contain biosafety level 1 or 2 organisms typically found in water.

The organism should be identified to the correct family, genus or species level.

Analyte	Method	AV	Range	SDPA	Reporting units	DP
Identification of unknown organism	All	Qual Form	NA	NA	NA	NA

Sample PT-WT-427

Supplied as:

Paper exercise

Participants will be provided with a photograph and a scenario in order to count the number of colonies and calculate the number of microorganisms in the original sample.

Analyte	Method	AV	Range	SDPA	Reporting units	DP
Colony count and calculation of number of microorganisms	Visual count	Formulation	0 to 10,000	Greater of robust SD or log ₁₀ 0.05	Various	0

Sample PT-WT-429

Supplied as:

Total viable count in dialysis water

10ml vial (to be reconstituted to a final volume of 100ml)

Analyte	Method	AV	Range	SDPA	Reporting units	DP
Total aerobic count @ 17-23°C	All	RMean	0 to 100	log ₁₀ 0.35	cfu/ml	0

Sample PT-WT-431*

Supplied as:

Somatic Coliphages (φX174) in drinking water

1 x lyophilised vial

Analyte	Method	AV	Range	SDPA	Reporting units	DP
Detection of Somatic coliphages	All	Positive/Negative	Qual Form	NA	NA	NA
Quantification of Somatic coliphages	All	0 to 1,000	Formulation	Robust SD	PFU/100ml ⁻¹	NA

Sample PT-WT-432*

Supplied as:

Microorganisms in Effluent sludge

10g simulated sludge sample

Analyte	Method	AV	Range	SDPA	Reporting units	DP
Enumeration of Enterococci	All	RMean	0 to 10,000	log ₁₀ 0.50	cfu/ml	0
Enumeration of <i>Escherichia coli</i>	All	RMean	0 to 10,000	log ₁₀ 0.50	cfu/ml	0
Enumeration of Enterobacteriaceae	All	RMean	0 to 10,000	log ₁₀ 0.50	cfu/ml	0

Sample PT-WT-433*

Supplied as:

Endoscope water

10ml vial (to be reconstituted to final volume of 1 litre)

Analyte	Method	AV	Range	SDPA	Reporting units	DP
Total viable count	All	RMean	0 to 100	log ₁₀ 0.35	cfu/100ml	0
Detection of environmental <i>Mycobacterium</i> species	All	Qual Form	0 to 1,000	NA	Detected/Not Detected 100ml	NA
Detection of <i>Pseudomonas aeruginosa</i>	All	Qual Form	0 to 1,000	NA	Detected/Not Detected 100ml	NA

Sample PT-WT-434*

Supplied as:

Detection of Salmonella in water (all types)

10ml vial (to be reconstituted to final volume of up to 10 x 1 litre)

Analyte	Method	AV	Range	SDPA	Reporting units	DP
Detection of <i>Salmonella</i> species	All	Qual Form	0 to 10,000	NA	Detected/Not Detected L	NA

Sample PT-WT-435*

Supplied as:

Microorganisms in Surface/Waste/recreational

10ml vial (to be reconstituted to final volume of up to 10 x 1 litre)

Analyte	Method	AV	Range	SDPA	Reporting units	DP
Enumeration of <i>Escherichia coli</i>	All	RMean	0 to 100,000	log ₁₀ 0.35	cfu/100ml	0
Enumeration of Enterococci	All	RMean	0 to	log ₁₀ 0.35	cfu/100ml	0

Analyte	Method	AV	Range	SDPA	Reporting units	DP
			100,000			
Enumeration of <i>Pseudomonas aeruginosa</i>	All	RMean	0 to 100,000	log ₁₀ 0.35	cfu/100ml	0

Sample PT-WT-436*

Somatic Coliphages (φX174) in Wastewater

Supplied as:

1 x lyophilised vial

Analyte	Method	AV	Range	SDPA	Reporting units	DP
Detection of Somatic coliphages	All	Positive/Negative	Qual Form	NA	NA	NA
Quantification of Somatic coliphages	All	0 to 1,000	Formulation	Robust SD	PFU/ml ⁻¹	NA

Sample PT-WT-437*

Aeromonas species in water

Supplied as:

10ml vial (to be reconstituted to final volume of up to 1 litre)

Analyte	Method	AV	Range	SDPA	Reporting units	DP
Detection of <i>Aeromonas</i> species	All	Qual Form	0 to 1,000	NA	Detected/Not Detected 100ml	NA
Enumeration of <i>Aeromonas</i> species	All	RMean	0 to 1,000	log ₁₀ 0.35	cfu/100ml	0

Sample PT-WT-438*

Vibrio in recreational water

Supplied as:

10ml vial (to be reconstituted to final volume of up to 1 litre)

Analyte	Method	AV	Range	SDPA	Reporting units	DP
Detection of <i>Vibrio</i> species	All	Qual Form	0 to 10,000	NA	Detected/Not Detected L	NA

Sample PT-WT-439*

Burkholderia cepacia in pharmaceutical water

Supplied as:

10ml vial (to be reconstituted to final volume of 1 litre)

Analyte	Method	AV	Range	SDPA	Reporting units	DP
Detection of <i>Burkholderia cepacia</i>	All	Qual Form	0 to 1,000	NA	Detected/Not Detected 100ml	NA
Enumeration of <i>Burkholderia cepacia</i>	All	RMean	0 to 1,000	log ₁₀ 0.35	cfu/100ml	0

Sample PT-WT-440*

Supplied as:

Enterobacteriaceae in water

10ml vial (to be reconstituted to final volume of 1 litre)

Analyte	Method	AV	Range	SDPA	Reporting units	DP
Detection of Enterobacteriaceae	All	Qual Form	0 to 1,000	NA	Detected/Not Detected 100ml	NA
Enumeration of Enterobacteriaceae	All	RMean	0 to 1,000	log ₁₀ 0.35	cfu/100ml	0

*Please note these samples are not currently within the scope of LGC's UKAS accreditation.